May 14, 2012

Ms. Charlotte Horn
MC 205
Office of Legal Services
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Re: Chapter 298- Environmental Flow Standards for Surface Water Rule Project Number 2011-059-298-OW

Dear Ms. Horn:

The National Wildlife Federation and the Lone Star Chapter of the Sierra Club appreciate the opportunity to provide comments on the proposed rules for the development of environmental flow standards for the Colorado and Lavaca Rivers and Matagorda and Lavaca Bays area (*Colorado/Lavaca*) and Guadalupe, San Antonio, Mission, and Aransas rivers and Mission, Copano, Aransas, and San Antonio bays area (*Guadalupe/San Antonio*). For the past eleven years, our organizations have worked cooperatively with many federal, state, and local entities and stakeholders to find an appropriate balance between water for the environment and human consumptive needs. We believe that striking an appropriate balance in allocating our water resources is essential to sustaining the future health and economic well-being of Texas overall. To this end, we have been deeply involved in the Senate Bill 3/House Bill 3 (SB3/HB3) process from the beginning.

Representatives from both of our organizations served as members of the Colorado/Lavaca and Guadalupe/San Antonio stakeholder committees that were tasked by the Texas Legislature with recommending environmental flow standards for new water permits and strategies to meet those standards. In signing on to participate in this consensus-based process, we agreed to work alongside a very diverse group of stakeholders to develop a suite of environmental flow recommendations for both bay/basin areas that balances the needs of the environment with human water needs. We recognized that taking a seat at the table meant being willing to compromise with representatives of other interests, and that

ultimately the stakeholder committees would be unlikely to recommend the levels of environmental protection that we believe should be ensured.

Stakeholders in both basins worked tirelessly to fulfill the spirit of the environmental flows process and develop Texas-based solutions for Texas water resource issues. The recommendations delivered to TCEQ by the Colorado/Lavaca and Guadalupe/San Antonio stakeholder committees on September 1, 2011 were delicately crafted to strike a balance between human and environmental water needs as was deemed to be appropriate by the stakeholders of each bay/basin area. In supporting those recommendations, our organizations made many concessions away from our preferred level of environmental protections. While it is difficult at this juncture not to aggressively advocate for rules that are more protective than what the stakeholder committees put forward, we feel that to do so would be inconsistent with the commitment we made and the spirit of cooperation and good faith exhibited by these two stakeholder committees overall. We, like all stakeholder participants, had a fair hearing and consideration of our interests at the stakeholder committee level and, in fairness to the others who participated in this process as well as to the process itself, we are submitting comments in support of the stakeholder committee recommendations. We do so even though those recommendations depart uncomfortably from what the bay/basin expert science teams recommended as being adequate to support a sound ecological environment.

Accordingly, we urge the Texas Commission on Environmental Quality (TCEQ) to adopt rules that incorporate the full suite of instream flow and estuary inflow recommendations as submitted by the Colorado/Lavaca and Guadalupe/San Antonio bay/basin area stakeholder committees and nothing less.

Considering the thorough documentation and the carefully-considered balancing of needs that are embodied within the stakeholder recommendations, it is deeply troubling to our organizations to see TCEQ propose rules that deviate so dramatically from what the stakeholder committees recommended with little or no explanation for these deviations. These were remarkably productive stakeholder processes, resulting in unanimous recommendations for the Colorado and Lavaca Basins and recommendations endorsed by a very large super-majority for the Guadalupe and San Antonio Basins. We do acknowledge that, for the Colorado and Lavaca Basins, most of the core components of the unanimous stakeholder recommendations are reflected in the proposed rules and appreciate the efforts of TCEQ staff to incorporate those aspects into the proposed rules. Unfortunately, even there, some critically important protections are missing. And, for the Guadalupe and San Antonio Basins, the differences between the stakeholder recommendations and the proposed rules are quite massive.

Although we understand that there will be circumstances where TCEQ would be justified in deviating from stakeholder recommendations, even after successful processes like these, those deviations should be rare and based on strong and clear justifications. Unfortunately, TCEQ's purported justifications are far from clear and far from strong.

Our comments are divided into two main sections: I. General Comments, and II. Specific Comments on the Preamble and Proposed Rule. The General Comments section includes comments that relate to overarching issues about TCEQ's proposed rule package including the difficulty of understanding what staff did in developing the proposed rules, while the Specific Comments provide input on specific language in the preamble and proposed rules.

I. GENERAL COMMENTS ON THE PROPOSED RULE:

A. Senate Bill 3/House Bill 3 Statutory Standard

TCEQ's proposed rules for the Guadalupe/San Antonio and Colorado/Lavaca bay/basin areas do not comply with the Senate Bill 3/House Bill 3 statutory requirements for the agency's development of environmental flow standards for these bay and basin areas.

In 2007, the Texas Legislature passed Senate Bill 3/House Bill 3 which noted: "The legislature finds that to provide certainty in water management and development and to provide adequate protection of the state's streams, rivers, and bays and estuaries, the state must have a process with specific timelines for prompt action to address environmental flow issues in the state's major basin and bay systems, especially those in which unappropriated water is still available."[1] The goal of Senate Bill 3/House Bill 3 is to establish "a process for the development and implementation of environmental flow standards applicable to new appropriations for surface water use in each of the major river basins and estuarine systems across the State of Texas". [2]

The legislation sets out a very specific process for the development of environmental flow standards and environmental flow set asides and contemplated that the commission, based on consensus scientific recommendations and stakeholder recommendations adopt environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors."[3]

Thus, the commission has strong legislative direction that the standards it adopts must be adequate to support a sound ecological environment unless it simply would not be reasonable to do so because of the adverse impact that would be caused to other public interests as a result of adopting protective standards. Accordingly, the starting point for the commission's development of flow standards must be whether those standards would be adequate to support a sound ecological environment. If they are shown to be adequate to accomplish that result they should be adopted unless there is a specific showing that adopting those standards would result in an unreasonable adverse impact to other public interests. In other words, a decision by the commission that it is not reasonable to protect a

[1] Senate Bill 3, Section 1.06 (d-2), 80th Legislative Session, 2007
[2] Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas and San Antonio Bays Basin and Bay Area Stakeholder Committee Recommendations Report, September 1, 2011, pg 1.
[3] Tex. Water Code 11.1471(a)(1)

sound ecological environment must be clearly justified. Specifically, if the proposed standards are not shown to be adequate to protect a sound ecological environment, there must be adequate justification demonstrating that providing greater protection would not be reasonable because of the adverse impact to other public interests. As the Legislature has expressly noted, "[m]aintaining the biological soundness of the state's rivers, lakes, bays, and estuaries is of great importance to the public's economic health and general well-being."[4]

The proposed environmental flow standards for the Guadalupe/San Antonio and the Colorado/Lavaca areas have not been shown to be adequate to support a sound ecological environment.

No evaluation by TCEQ staff has been undertaken to demonstrate the protectiveness of the proposed standards and their adequacy to protect a sound ecological environment. The proposed standards for the Colorado/Lavaca (CL) area are fairly close to those recommended by the Colorado/Lavaca bay/basin area stakeholder committee (CL BBASC) in many respects but fall short in certain key areas. Those CL BBASC recommendations are significantly less protective than the levels the Colorado/Lavaca bay/basin expert science team (CL BBEST) recommended, based solely on consideration of the best available science, as being adequate to protect a sound ecological environment. The proposed standards for the Guadalupe/San Antonio (GSA) area are much less protective than the standards recommended by the Guadalupe/San Antonio bay/basin area stakeholder committee (GSA BBASC). Additionally, those GSA BBASC recommendations are much less protective than the levels of protection the Guadalupe/San Antonio expert science team (GSA BBEST), based solely on consideration of the best available science, indicated would be adequate to protect a sound ecological environment.

The proposed environmental flow standards for the Guadalupe/San Antonio and the Colorado/Lavaca areas have not been shown to be adequate to support a sound ecological environment and available information indicates that they likely fall short.

As noted above, the stakeholder recommendations represent a significant relaxation of protections from what the BBESTs recommended. In the case of the GSA BBASC recommendations, key reductions in protection from the BBEST recommendations include:

[4] Tex. Water Code §11.0235 (b).

- significantly reduced bay and estuary freshwater inflow attainment frequencies for the lower flow categories/criteria levels,
- lowered base flow numbers for dry, average and wet hydrologic conditions at two downstream gauge locations: Guadalupe River at Gonzales and Guadalupe River at Victoria,
- the 20% pulse exemption rule that, based on a ratio of diversion rate to protected pulse flow volumes, would allow some diverters to be exempt from passing pulses,
- a reduction from three tiers of base flows to one tier of base flows for the fall and winter seasons at three downstream gauges: Guadalupe at Gonzales, Guadalupe at Cuero, and Guadalupe at Victoria.

When the GSA BBASC did various assessments to look at the effects on project yields and the environment of making alterations to the BBEST recommendations, the group consistently found that the flow regimes being considered by the BBASC offered higher yields than the BBEST recommendations did for the water supply projects that were modeled.

Although an increase in project yield does not always equate to a reduction in environmental protection, it is reasonable to conclude that, more often than not, increasing water supply project yields reflects a reduction in water flowing in the river downstream. When looking only at the impacts of a single modestly-sized potential project, the environmental impacts may not be obvious. However, current conditions, even without additional permits, are already far below the levels recommended by the GSA BBEST as being protective of a sound ecological environment. Each incremental impact makes that chasm greater.

So from the BBEST recommendations that are intended to be adequate to provide for a sound ecological environment, the GSA BBASC recommendations represent a significant relaxation of those protections. Despite a claim otherwise in the proposed rules,[5] the BBASC report never states that the BBASC recommendations are deemed to be protective of a sound ecological environment, rather that they were recommending a balance between what was known to be sound and the other factors the BBASC was to consider.

A second set of reduced protections occurs when comparing the GSA BBASC recommendations to TCEQ proposed rules. These main categories of additional reductions to protections include:

[5] In fact, TCEQ goes farther and purports to rely on a non-existent statement in the GSA BBASC report for support that TCEQ's reduced protections as reflected in the proposed rule are adequate to meet the test.

- the removal of all overbank pulses
- the removal of high flow pulses that are larger than seasonal
- the removal of the larger tier of seasonal base flows in the Guadalupe River Basin
- the reduction from three tiers of base flows to one tier of base flows for all seasons and throughout all gauges in the Guadalupe River Basin
- a further 10% relaxation of the freshwater inflow attainment frequency standards
- the omission of the 10% dedication rule

These changes are major departures from an environmental protection standpoint. With the very significant departure the GSA proposed rules make from the benchmark of the GSA BBEST recommendations, TCEQ faces a steep test in demonstrating that its proposed rules are adequate to protect a sound ecological environment. That test is not met by inserting a statement in the proposed rule stating that it is so.

In the case of the CL BBASC recommendations, deviations from the BBEST levels recommended as being adequate to support a sound ecological environment include:

- significantly reduced bay and estuary freshwater inflow attainment frequencies across the board,
- significantly reduced large pulse flow protections
- a reduction in subsistence flow levels at several locations
- absence of protections of channel maintenance flows

Comparing the TCEQ proposed rule to the CL BBASC recommendations reveals additional losses in protection including:

- greatly reduced large pulse flow protections
- omission of flushing flow protection for Lavaca Bay
- failure to specifically include protections of monthly minimum inflows to Matagorda Bay

With these differences between the CL proposed rules and the benchmark of the CL BBEST recommendations, TCEQ faces another significant challenge in demonstrating that its proposed rules are adequate to protect a sound ecological environment.

The proposed rules make an unfounded and likely incorrect statement that the standards therein would be protective of a sound ecological environment.

Because no ecological evaluation has been identified by TCEQ as assessing if the proposed rule is protective of a sound ecological environment, TCEQ's statement to that effect is unsupported and unjustified. Additionally, the rule seems to imply that the stakeholder recommendations do protect a sound ecological environment and that therefore the proposed standards do as well. Neither piece of this statement is founded. Neither stakeholder committee performed an assessment of ecological soundness on their final recommendations.[6] It was understood by both BBASCs that the science team recommendation was the benchmark for that test, and the stakeholders' charge was a balancing between that benchmark and other factors such as future human water supply needs. Given that the proposed rule is a significant step down in protections even from what stakeholders proposed, it is completely unsupported to suggest, without an independent basis, that the proposed standards would be protective of a sound ecological environment.

TCEQ has not shown that adoption of the proposed flow standards for the Guadalupe/San Antonio and the Colorado/Lavaca areas, which are not shown to be adequate to support a sound ecological environment, are justified based on other considerations.

In order to adopt anything less than a standard that would be adequate to protect a sound ecological environment, the commission must justify why it would not be reasonable to adopt a standard adequate to achieve that level of protection. The rationale provided by TCEQ for deviations from the BBEST recommendations and from the BBASC recommendations is seriously lacking.

The rationale in the proposed rule for deleting larger pulses is insufficient.

TCEQ staff's rationale for deleting pulses between the seasonal pulses and the overbank pulses is that there isn't a site-specific study to support pulse recommendations with a duration of longer than 30 days.[7]

First, SB 3 does not contemplate waiting for site-specific studies. To the contrary, it provides that recommendations are to be based on the best available science now, while some unappropriated water is still available to be protected, and then are to be refined

[6] The CL BBASC did elicit an opinion from the BBEST that the reduced subsistence flow levels would not be expected to undermine the protection of a sound ecological environment.
[7] *37 TexReg 2528.*

over time through the work plan process.

Second, there is certainly no shortage of studies or literature acknowledging the need for a full regime of pulse flows. Guidance from the Science Advisory Committee, the BBEST report, the Senate Bill 2/Texas Instream Flow Program (TIFP) site-specific studies, and the National Research Council Review of the TIFP all discuss the importance of a full regime of pulse flows.

Protections of larger pulses are not only critical for riverine considerations, such as channel geomorphology, water quality considerations and invasive species control for example, but are also essential for maintaining bay and estuary health. Such pulses are the delivery mechanism for sediments and nutrients from the rivers into the bay systems that rebuild barrier islands and provide food for estuarine species. Additionally these slugs of fresh water help to flush out the bay system by lowering salinity levels and knocking back infestations of *dermo*—which can decimate oysters when salinities stay high especially during hotter periods of time. Recreationally and commercially important species would be impacted if larger pulse flows ceased getting to the bay system. Coastal communities would be adversely impacted. The segments of our economy that are associated with healthy bay systems, commercial and recreational fishing, marinas, seafood restaurants, hotels, and associated small business owners would suffer.

By eliminating protection for these larger pulses, critically important freshwater inflows necessary to maintain a sound ecological environment could be captured. This loss of protection is particularly damaging for the San Antonio Bay system during the fall and winter periods for which no quantified freshwater inflow protections are available to provide a backstop for inflow protections. The combination of a lack of freshwater inflow protections and a lack of large pulse protections during these periods makes the estuary systems particularly at risk at precisely at the time that the endangered whooping cranes are feeding and raising young in the Aransas Wildlife Refuge which depends on inflows from these basins.

The deletion of these critically important protections from TCEQ's rules, resulting in protections well below the levels recommended by the GSA BBASC, has not been justified. The absence of site-specific studies certainly does not provide adequate justification. Indeed, it cannot be justified. As demonstrated by the balancing exercises undertaken by the GSA BBASC, reasonable development of new water supply projects could move forward with protections at least as strong as those recommended by the stakeholder committee.

The CL BBASC undertook similar balancing exercises which demonstrated that the levels of

protection recommended by the committee would still allow reasonable development of new water supply projects in the limited locations where any significant amount of unappropriated water is available.

The rationale in the proposed rule for deleting overbank flows from the rules is insufficient.

The stated basis for not including overbank flows is that they are generated by natural rain events and are expected to continue. [8]

Like all pulses and, indeed, all freshwater inflows, we also expect them to continue unless a project big enough to catch them is built. That is the whole point of including protection of those flows in the BBEST and BBASC recommendations and it is why those protections should be included in environmental flow standards. Large on-channel reservoirs can produce large reductions in overbank flows.

Overbank flows provide many critical ecological functions, such as providing life cycle cues for many species, seed dispersal, floodplain connectivity and nutrient deposition, and providing freshwater inflow and sediment delivery to bays and estuaries. All water comes from natural rain events.

There is no justification provided in the proposed rule for the proposed reduction in the GSA bay and estuary freshwater inflow protections by 10% below the levels recommended by the GSA BBASC.

The proposed rule package fails to explain the genesis of, or the purported justification for, the inclusion in the proposed rules of a 10% reduction in protection for frequencies of freshwater inflows as compared to the frequencies recommended for protection by the GSA BBASC. As noted above, those BBASC-recommended frequencies are far less protective than the levels recommended by the GSA BBEST for drier period inflows. Accordingly, those BBASC frequencies do not meet the levels recommended as being adequate to support a sound ecological environment. The BBASC undertook extensive evaluations and determined that reasonable new water supply development could occur with the frequencies the BBASC recommended for protection. There is nothing in the proposed rule that indicates using the BBASC freshwater inflow attainment frequencies would result in an

[8] *37 TexReg 2526*

unreasonable adverse impact to other public interests.

The rationale in the proposed rule for deleting the GSA BBASC 10% dedication to the bay and estuary system is unfounded.

The stated justifications for not including the 10% dedication to the bay and estuary are that the proposed flow standards are protective of the environment without the 10% dedication. The rule also states that requiring the dedication would encourage applicants to request more water than needed.[9]

We were unable to find any support for the statement that the proposed standards are protective without the 10% dedication. To our knowledge, no environmental assessment of the proposed standard was conducted and, certainly, no such assessment is referenced in the proposed rule package. As noted above, there is no clear basis for contending that the full suite of BBASC recommendations is adequate to support a sound ecological environment. Considering the proposed rule strips away three additional key pieces of the GSA bay and estuary protections—1) omission of large pulse flow protections that would protect delivery of water to the bay: overbank pulses as well as all large pulses in the Guadalupe Basin; 2) three tiers of base flows that reflect hydrologic conditions (in the Guadalupe); and 3) a 10% reduction to freshwater inflow attainment frequencies—this is more than a stretch.

Concerning the second statement about encouraging requests for more water, it has always been our understanding that TCEQ is charged with evaluating the reasonableness of all applications and with only granting the amount needed. However, more fundamentally, the Stakeholder Committee's recommendations are clear in supporting flexibility for meeting the *equivalent of a 10% dedication*, including through methods like dedicating a portion of return flows produced as a result of the new project

The rationale in the proposed rule for reducing protections from three levels of base flows to one level of base flow in the Guadalupe River Basin is insufficient.

[9] 37 TexReg 2528

The BBEST report notes, a single base-flow regime could result in the complete loss of a specific component of the aquatic community because there is no longer the necessary variability…" [10]

The rationale for how TCEQ came to this proposed set of standards for the Guadalupe Basin is not at all clear.

As near as we can tell, the staff's substitution of an "East Texas TCEQ structure"—a minimal flow structure that includes a subsistence flow, a single base flow, and single pulse tier—in place of the GSA BBEST recommendations or stakeholder recommendations for the entire Guadalupe Basin is based on a TCEQ Water Availability Model run and an attempt to minimize impact to water availability based on that run. As discussed further below under the Modeling heading, there are numerous questionable assumptions embedded in that WAM run. The run is based on an analysis of a very large diversion project without storage. The BBASC devoted a lot of time and financial resources to evaluating impacts of its recommendations on reasonably representative potential water supply projects. All of those projects involved storage because, in the view of the stakeholders and the technical consultants, a viable project of significant size necessarily would include storage.

TCEQ has not fulfilled the statutory directive to set aside unappropriated water to protect the proposed environmental flow standards.

The commission is directed to "establish an amount of unappropriated water, if available, to be set aside to satisfy the environmental flow standards to the maximum extent reasonable when considering human water needs." Tex. Water Code §11.1471 (a)(2). In addition, the statue sets a high standard for any exception to that requirement.

Yet the commission is not proposing to set aside any unappropriated water for the protection of the proposed environmental flows standards.[11] Although we acknowledge the complexity of the challenge involved in some aspects of establishing set-asides of unappropriated flows, we do not believe that the failure of the commission to set aside water for environmental flow protection purposes has been adequately justified.

The justification given is that the environmental flow standards may be adequately protected by special conditions in water right permits or amendments for new

[10] See Section 3.3.1.2 Quantification of Flow Regime Components, page 3.27, BBEST Environmental Flows Recommendations Report
[11] *37 TexReg 2529*

appropriations of water in these basins, and that this would be beneficial because it would allow more flexibility in using that water for other purposes. However, in the absence of a demonstration that special conditions can reliably satisfy applicable environmental flow standards, environmental flow set asides are needed.

One particular value of environmental flow set asides is that they establish an affirmative right for environmental flow protection with a priority date that would allow the Texas Parks and Wildlife Department to act in the role of a water right holder[12] to enforce the right and to make a priority call for that water.

If the commission does not establish environmental flow set asides at this time, it will be critical for the commission to acknowledge and respect the availability determinations noted in the proposed rules in future water rights permitting decisions in order to retain and protect its ability to meaningfully revisit the issue of establishing environmental flow set asides during the first revision process for these standards.

We do recognize that neither BBASC included a recommendation for set asides. However, in the absence of the adoption of flow standards at least as protective as the recommendations of the BBASCs, TCEQ certainly has not justified its failure to establish environmental flow set asides.

B. Consensus

Pursuant to Section 11.02362(o) of the Texas Water Code, each BBASC was charged with operating on a consensus basis to the maximum extent possible. The Guadalupe/San Antonio BBASC took this charge seriously and early in the process unanimously adopted meeting rules noting that "the group shall attempt to make decisions based on consensus," expressing a willingness to compromise and make concessions in order to reach an agreement that everyone could live with. Recognizing that "consensus does not necessarily mean unanimity," the group determined that an affirmative vote of 75% of the full BBASC voting membership would be required for a motion to be approved and thus represent the recommendation of the group. [13] The Colorado/Lavaca group developed very similar rules.

The CL BBASC was able to reach unanimous agreement on their recommendations. In the Guadalupe/San Antonio, despite the best efforts of the Committee Chair, many stakeholders, and the facilitation team hired by the Stakeholder Committee, the full

[12] Section 11.0841 (c) of the Water Code, as amended by Senate Bill 3, provides that authority to the Parks and Wildlife Department.
[13] Meeting Rules For the Guadalupe, San Antonio, Mission and Aransas Rivers/Mission, Copano, Aransas and San Antonio Basin and Bay Area Stakeholder Committee (BBASC), March 1, 2010 (APPROVED)

recommendations report did not receive unanimous endorsement. To many Guadalupe/San Antonio stakeholders, this was very disappointing, as much effort had been put towards this goal.

However, it is now clear that unanimity was an unobtainable goal for the GSA BBASC. In the final weeks of the stakeholder process, the Guadalupe Blanco River Authority (GBRA) stakeholder representative stated to another stakeholder that it was in his organization's best interest to not reach consensus. He also noted that a non-consensus strategy had worked to the benefit of water supply interests in the two previous bay/basin areas to undergo the environmental flows process.

Given this, the GSA BBASC obviously faced a rocky road, having at least one member agreeing to participate in a consensus-based stakeholder process without any intent to try to reach consensus. It is most certainly appropriate that GBRA's interests be considered in the development of environmental flow standards for this bay/basin area and they were. The BBASC worked very diligently to modify its recommendations to better accommodate the interests of GBRA and the two other BBASC members who ultimately did not support adoption of the Recommendations Report. Many concessions were made by other stakeholders to try to achieve unanimous support, which we now know was an unachievable goal.

C. BBASC and BBEST Interaction

Senate Bill 3 recognized the urgency for developing environmental flow rules. Thus, rather than waiting until site-specific studies were available for all rivers and estuaries, that legislation instructs BBESTs to "consider all reasonable available science and without regard to the need for the water for other uses, and the science team's recommendations must be based solely on the best science available."[14]

The BBESTs for both the Colorado/Lavaca and Guadalupe/San Antonio followed this mandate.

In the Science Advisory Committee (SAC) review of the BBEST report, the SAC suggested that the GSA BBEST relied heavily on historical flow values to develop environmental flow recommendations. What should not be overlooked is that the SAC also commented, "the work of the GSA BBEST may have been more complete than its report would suggest and

[14] Section 11.02362(m) of the Texas Water Code

encouraged the GSA BBEST membership to engage in robust interaction with the GSA BBASC as it undertook development of recommended environmental flow standards and strategies." [15]

As noted on page 20 of the GSA BBASC report, and discussed below, such robust interaction did occur. While the BBEST report submitted on March 1st, 2011 did not change (as mandated by statute), it is inappropriate to assume that careful consideration of scientific data and observation and robust interaction with not only BBEST and BBASC, but SAC as well, did not continue past this statutory deadline. During such interactions, it became apparent that the work of the GSA BBEST suffered not from lack of completeness, but from the lack of opportunity to respond to critique.

In addition, it should not be overlooked that during the course of BBASC deliberations, the BBEST worked with the stakeholder group to carefully consider and vet the scientific data and observations that comprised the BBEST recommendations. As a result of these discussions, there were several areas where the BBASC stakeholder group, working in conjunction with BBEST members, recommending different levels of protection from the BBEST recommendations based on additional science as well as balancing consideration.

Finally, some dissenting stakeholders have argued that the BBEST report does not adequately provide a predictive response of estuarine indicators. Although all applied scientific methods inherently carry some uncertainty, the salinity zone approach as used by the BBEST is widely used in both Texas [16] and other states such as Alabama, [17], Florida,[18] and Maine [19] for studies of estuarine inflow needs. It is also a recognized method by the

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[15] See Appendix B – Science Advisory Committee Review and Comments Regarding the GSA BBEST Environmental Flows Recommendations Report *in* BBASC Stakeholders Committee Recommendations Report

[16] Final Report, Matagorda Bay Health Evaluation – Habitat Assessment. Prepared for Lower Colorado River Authority and San Antonio Water System. July 2007.

[17] See Brown, S.K., K.R. Buja, S.H. Jury, M.E. Monaco and A. Banner. 2000. Habitat Suitability index models for eight fish and invertebrate species in Casco and Sheepscot Bays, Maine. North American Journal of Fisheries Management 20: 408-435.

[18] See Christensen, J.D., T.A. Battista, M.E. Monaco and C.J. Klein. 1997. Habitat suitability indexmodeling and GIS technology to support habitat management: Pensacola Bay, Florida case study. Technical Report to the U.S. Environmental Protection Agency, Gulf of Mexico Program, National Oceanic and Atmospheric Administration, National Ocean Service, Strategic Environmental Assessments Division, Silver Spring, MD.

[19] See Rodgers, L.J. 2001. Assessment of oyster habitat in Mobile Bay, Alabama using index modeling, geographic information systems and computational fluid dynamic modeling. Ph.D. Dissertation, Auburn University, Auburn, Alabama.

SAC [20]. Thus it does constitute the best available science for the determinations that the BBEST made.

D. GSA Balancing

The Stakeholder Committee was tasked with achieving a balance between the water needs of fish and wildlife and human water needs. Human water needs also include maintaining sufficient water for commercial and recreational fishing industry. During public comment, coastal interests often reminded the BBASC committee that having sufficient water for fish and wildlife is in fact a human water need as well. The committee took this task very seriously and even self-raised well over $100,000 to hire a technical consultant team to examine the water supply yield impacts for potential new projects and environmental impacts of numerous environmental flow iterations in order to have a well-informed decision-making process.

The BBASC began its balancing of environmental and human water needs by evaluating how much a potential water project would be impacted if the environmental flow recommendations from the BBEST were fully adopted. Such impacts to a version of the GBRA Mid-Basin water supply project as adopted in the State Water Plan, located on the Guadalupe River near Gonzales, were used as a touchstone.

The evaluation of the BBEST's environmental flow recommendations showed the firm yield of this version of the potential off-channel reservoir project would have been reduced to about 13,150 acre-feet (52% of the original firm yield of 25,000 acre-feet). Because that impact was considered to be too great, through an arduous process of balancing and efforts to get all members to come into agreement, the BBASC did eventually come to a set of flow standard recommendation that produced a potential firm yield of the project of 22,800 acre-feet (91% of the original firm yield).[21] An assessment of what this slight change in yield would do to project cost was also considered by the BBASC. With some slight reconfiguration of the project to maximize its potential in light of the proposed flow standard recommendations, the firm yield could likely be increased even further.

[20] See Science Advisory Committee [SAC]. 2009. Methodologies for Establishing a Freshwater Inflow Regime for Texas Estuaries Within the Context of the Senate Bill 3 Environmental Flows Process. Report # SAC-2009-03. June 5, 2009.

[21] See 3.3.1.5 Simulations Using the Final GSA BBASC Recommendations, page 60, BBASC Stakeholders Committee Recommendations Report

The Guadalupe/San Antonio BBASC undertook the task of balancing human and environmental water needs with great diligence. Specific examples of balancing towards human water needs that appear in the BBASC recommendations include:

- Decreasing the level of Subsistence Flows to 60 cfs down from the TIFP 80 cfs for three gage sites on the San Antonio River
- Applying the 20% Pulse Exemption Rule to every gage location
- Reducing three levels of base flows to one level of base flow in the Winter and Fall seasons at the three lower gage sites on the Guadalupe River (@ Gonzalez, @ Cuero, and @ Victoria)
- Reducing the cfs levels of the base flows in all seasons, under all three sets of hydrologic conditions at the Guadalupe @ Gonzales gage and the Guadalupe @ Victoria gage
- Reducing the BBEST bay and estuary attainment frequency recommendations significantly in the GI-D, G2-C, G2-CC, G2-D, G2-DD categories to a "make it no worse" requirement reflecting existing water rights

However, most members of the GSA BBASC struggled with reducing environmental protections as much is represented in the bullets above, and this package of reductions to protections could not be accepted by the group without the recommended 10% dedication, or equivalent, to freshwater inflows to the bays and estuaries. Additional discussion of the 10% dedication and its role in the GSA BBASC recommendations is under the Bay/Estuary Inflows section below.

Through these balancing efforts, the BBASC was able to demonstrate that environmental flow needs can be addressed, while still allowing reasonable water supply projects to be constructed. Despite allegations by some stakeholders to the contrary, it was never the intent of the stakeholder group to prevent surface water supply development in the basin, but instead to find a reasonable balance among needs.

E. Instream Flow Recommendations

As stated in the GSA BBEST report, a natural flow regime is a central scientific principle for the Texas Instream Flow Program (TIFP). [22] Such a natural flow regime contains five critical components: magnitude, frequency, duration, timing, and rate of change in flow. Variation in this flow regime is important ecologically in regards to overall aquatic

[22] See Section 3.3.1.1 Natural Flow Paradigm, page 3.25, BBEST Environmental Flows Recommendations Report

community dynamics. And as the BBEST report notes, a single base-flow regime could result in the complete loss of a specific component of the aquatic community because there is no longer the necessary variability…" [23]

Both the BBEST report, as well as the Texas Instream Flow study on the San Antonio River (the recommendations of which were used by the GSA BBASC in developing its recommendations), recognize the importance of a variable flow regime. Such a variable flow regime was adopted by consensus by the BBASC for all but three of the 16 stream gauge sites.

It has been misrepresented during previous comments to TCEQ that the science does not support the need for a variable flow regime; rather, that a "TCEQ East Texas Flow regime" would be adequately protective. However, this is contrary to the findings from the TIFP on the San Antonio River which demonstrated the need for three tiers of baseflow, multiple tiers of high flow pulses, and multiple tiers of overbank flow. In fact, the recommendations of the TIFP are very similar in structure to the recommendations of the BBEST, although the flow volume recommendations from the TIFP are generally higher than those from the BBEST.

During the course of deliberations, the GSA BBASC did examine the potential implementation of a "TCEQ East Texas Flow regime" on both the Guadalupe and San Antonio Rivers. Such a regime was rejected by the group when it was shown by BBASC consultants to be less protective of the environment than methods currently in use, having a greater impact on intermediate flows, especially with the additional of multiple projects.

Another key aspect of the GSA BBASC's Recommendations is the 50% rule governing the transition from base flow to subsistence flow diversion restrictions. The 50% rule provides key protections to avoid unduly artificially increasing the amount of time at subsistence flow levels far beyond the levels considered protective and the duration of periods of flows at or below those levels. The 50% rule is designed to mimic the types of flow changes that are naturally occurring in the system. We acknowledge and appreciate TCEQ's recognition of the value of the 50% rule and its inclusion in the proposed rules.

F. Bay and Estuary Inflow Recommendations

[23] See Section 3.3.1.2 Quantification of Flow Regime Components, page 3.27, BBEST Environmental Flows Recommendations Report

The proposed rule omits the 10% dedication to the bay and estuary system recommended by stakeholders without adequate justification for doing so.

The Guadalupe-San Antonio BBEST report illustrates that with the full utilization of existing water rights, inflows to San Antonio Bay will not meet the inflow criteria recommended to maintain a sound ecological environment. [24] **In fact, updates made to the Estuary Inflow model as part of the BBASC analysis show that Present Conditions do not meet the inflow criteria recommended to maintain a sound ecological environment.** [25] Yet as part of the balancing done by the stakeholder group to ensure water availability for potential water supply projects such as the Mid-Basin project, the Committee compromised on the adoption of a simplified flow regime at three locations in return for the requirement that future permits in the basin be required to dedicate, through some reasonable mechanism, the equivalent of 10 percent of their permitted amount to help provide flows to the bays and estuaries.

The recommendation for a 10% dedication of project yield to freshwater inflow protection, GSA Report at p. 125, while extremely important and forward-looking, does not represent anything particularly exceptional for Texas water rights permitting. At its core, it simply serves to recognize that permit conditions to protect environmental flows can take many forms, including measures such as requiring a certain amount of wastewater flows to be returned to the stream or requiring releases from storage. It is not unprecedented for TCEQ, or one of its predecessor agencies, to impose permit conditions in the form of required releases from storage and/or the required return of a portion of return flows to help protect environmental flows. The 10% dedication aspect of the Stakeholder Committee recommendations represents a comparable approach.

Dissenting stakeholders have argued that new permits by definition will not negatively harm bays and estuaries, as they will be subject to environmental flow restrictions. Although it likely would be possible to derive environmental flow restrictions that would be restrictive enough to prevent any adverse impacts, given the current state of water availability, they likely would not allow for significant water supply development. Instead, the BBASC identified a middle-ground. They recommended reasonably protective flow standards that would help limit adverse impacts while also incorporating the 10% dedication concept to help offset the adverse impacts that could not be entirely avoided. It was developed as a package. That package also included the full complement of

[24] See also, Appendix G – "Biological and Ecological Implications of Non-Attainment of the BBEST Guadalupe Estuary Criteria," Report by the GSA BBEST Estuary Sub-Committee, *in* BBASC Stakeholders Committee Recommendations Report
[25] See Table E2-6, part b), Appendix E2-Estuary Analyses : Additional Resources and Methodological Details, GSA BBASC Recommendations Report

recommended pulse flow protections, many of which are not included in the proposed rules.

As shown in the analysis prepared as part of the BBASC deliberations, "Biological and Ecological Implications on Non-Attainment of the BBEST Guadalupe Estuary Criteria", such speculation about avoidance of adverse impacts is unfounded. As shown on page 63 and 64 of the BBASC report, the historical attainment frequencies already slightly exceed recommended attainment frequencies. With the addition of the Region L Baseline (based upon projected water use in the region) these attainment frequencies are greatly exceeded by two to three times.

Nothing in Senate Bill 3 suggests that permit conditions such as the 10% dedication would not be appropriate mechanisms for implementing environmental flow standards. The environmental flow standards recommended by the Stakeholder Committee include limitations on diversions to help minimize the extent of adverse impact from those diversions. As explicitly noted in the Stakeholder Committee Report, the recommended quantities and frequencies of inflows to the Guadalupe estuary system are not expected to be achieved even with the full exercise of just existing water rights. Additional diversions, even though subject to recommended limitations on diversions, would further reduce inflows to the estuary system.

The Stakeholder Committee recommended further measures, described as the dedication of the equivalent of 10% of firm yield or annual diversion right, as an additional means to help off-set those impacts and otherwise protect needed freshwater inflows. Although the description of those additional measures as a 10% dedication serves as the means to quantify the extent of the required permit condition, the Stakeholder Committee recommendations indicate that a permit holder should be free to achieve the indicated flow quantity through a variety of means.

Thus, for example, a permit that included a condition requiring the permittee to provide an appropriate quantity of return flows generated as a result of water supply produced by the project could accomplish the recommended dedication. Similarly, permit conditions that required releases from storage during certain inflow conditions in a quantity equaling 10% of firm yield or annual diversion right also would accomplish the recommended result. In addition, the recommendations also indicate that the permittee should have the flexibility, if the permittee considered it to be advantageous, to pursue other types of strategies, such as entering into agreements for dedication of return flows from other projects, which would be equally effective in accomplishing the desired benefit to freshwater inflows.

The proposed rule includes a 10% reduction to the bay/estuary inflow attainment frequencies recommended by stakeholders without adequate justification for doing so.

The proposed rule removes critical bay/estuary protection for the fall and winter seasons by not including three tiers of base flows on the Guadalupe River and by not protecting high flow pulses and overbank pulses for the whole basin. There is inadequate justification in the rule for dropping these critical pieces from the flow regimes recommended by stakeholders.

H. Sound Ecological Environment for Guadalupe and San Antonio River Basins and San Antonio Bay System

The GSA BBEST environmental flow report submitted to the BBASC on March 1, 2011, represented the consensus recommendation, adopted by unanimous agreement, of the science group for flows adequate to support a sound ecological environment. The BBEST in their discussion of a sound ecological environment noted:

A sound ecological environment maintains, to some reasonable level, the physical, chemical, and biological attributes and processes of the natural system. Given the broadness of this definition, there is no single measure that can be employed to test or determine "soundness". However, there are many individual measures that are commonly used to assess components of a sound environment. These measures include water quality standards, habitat suitability and availability, indices of biologic integrity, estuarine salinity patterns, sediment transport, nutrient delivery, and species occurrence, abundance, and diversity.[26]

Following the submittal of the BBEST report, and during the course of GSA BBASC deliberations regarding balancing, the BBEST and BBASC worked together to identify areas where changes could be made to the BBASC recommendation, yet still maintain flows thought to be adequate to protect a sound ecological environment. For example, the BBASC worked with BBEST member, Dr. Thom Hardy to identify potential adjustments to base flow recommendations for two lower gauges of the Guadalupe River where additional habitat suitability studies had been conducted. Dr Hardy notes:

[26] Environmental Flows Recommendations Report, Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays Basin and Bay Expert Science Team, March 1, 2011, page 1.5

The analyses provided above would suggest that some reductions in the seasonal HEFR Low, Medium and High Base flow discharges could be entertained as part of the BBASC deliberations without substantially affecting the likelihood of maintaining a sound ecological environment based on physical habitat. ***Large-scale reductions in the flow regime however would likely raise the ecological risk of maintaining a sound ecological environment to unacceptable levels. The results should also not be interpreted, in this author's opinion to eliminate the three base flow regimes (i.e., collapse them into two or one regime recommendation).*** *Physical habitat is a necessary but not sufficient condition to maintain a sound ecological environment and without quantitative overlays for water quality and temperature the risk to these aquatic systems is unwarranted. Also, as noted above, alteration of the HEFR seasonal base flow regimes should be carefully weighed against potential impacts on Bay and Estuary inflow needs [27] [emphasis added].*

As a result of Dr. Hardy's analysis, the BBASC made reductions to the base flow values for two gauges on the Guadalupe River: Guadalupe at Gonzales and Guadalupe at Victoria.

However, heeding the advice of Dr. Hardy, the group, with one exception, did not make any large-scale reductions in the recommended flow standards, keeping the full suite of flows. The one exception was the replacement of three levels of base flow during the fall and winter months with the only one level of base flow, the high base flow value, for three downstream gauge sites on the Guadalupe River: Guadalupe at Gonzales, Guadalupe at Cuero and Guadalupe at Victoria. This weakening of base flow recommendations at these three sites, however, was offset by the compromise to include the 10% dedication requirement.[28]

In the course of the stakeholder efforts to find a balance between environmental goals and human water supply needs, the GSA BBASC also requested that the BBEST Estuary Subcommittee analyze the biological and ecological implications of not meeting certain recommended inflow criteria In their report to the BBASC, the Subcommittee first noted that their recommendations, as presented in their report, already had incorporated some weakening of some of inflow criteria:

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[27] *Evaluation of Aquatic Habitat Relationships in the Guadalupe River at the Gonzales and Victoria Study Sites,* Report by Dr. Thom Hardy, July 2011, Environmental Flows Standards and Strategies Recommendations Report, Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas and San Antonio Bays Basin and Bay Area Stakeholder Committee Recommendations Report, September 1, 2011, Appendix F, Section 4, unnumbered pages

[28] See 4.3.2 Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays Basin and Bay Area Stakeholder Committee Recommendations Report.

The attainment goals spelled out in Table 6.1-18 vary with regard to how much departure was recommended from the historical levels. In the professional judgment of the BBEST, the upper levels of G1 and G2 criteria (G1-A, G1-B, or G2-A and G2-B), representing good conditions for Rangia and oysters, respectively, could decline over a long period of time by up to 25% and still likely provide for a sound ecological environment. However, the BBEST also felt that the lowest levels of both criteria suites (G1-D and G2-D & G2-DD, together) which represent periods of limited reproductive success for Rangia and significant disease and parasite problems for oysters, respectively, should not be allowed to increase beyond historic levels.[29]

With respect to the future of health of the bay and estuary system utilizing the full utilization of water rights, the consensus conclusion of that Subcommittee is as follows:

a) there is the potential for long-term alteration in the area or density of Rangia clams, especially in the lower part of the current habitat area used as a focal area by the BBEST. This is due to the increasing prevalence of low and average inflows (G1-C & CC and D levels) which do not support reproduction of the clams in this portion of the habitat area.

b) however, since the Rangia clams are long-lived, and there are continuing reoccurrence of higher levels of inflows in the G1-Band G1-A range at a sufficiently short return interval, the clams would not likely be eliminated from any of the area used as a focal area by the BBEST.

c) because of the importance of Rangia as a filter feeder and as an apparent food source for other organisms, we would expect some concomitant impacts if their abundance were reduced. Filter feeding is a broad ecosystem service provided by Rangia's removal of suspended particulate matter, which contributes to water clarity. Literature indicates that Rangia are a food source for fish, waterfowl, and crustaceans, thus a reduction in the clams abundance could affect other species. Further investigation of the ecological role of Rangia in the Guadalupe Estuary is warranted.

d) the effects of the extension of duration of a severe drought such as that which would result from the same hydro-climatology of the historic 1950's period, could be detrimental, but likely transitory, for the oyster reefs in the Guadalupe Estuary. Based

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[29] *Biological and Ecological Implications of Non-Attainment of the BBEST Guadalupe Estuary Criteria*, Report by GSA BBEST Estuary Sub-Committee, "Environmental Flows Standards and Strategies Recommendations Report, Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas and San Antonio Bays Basin and Bay Area Stakeholder Committee Recommendations Report, September 1, 2011, Appendix G, page 3

upon published accounts of effects of the 1950's drought, there is the potential for significant mortality of oysters over a greater period within the estuary during the drought;

e) given that oyster parasites and the Dermo pathogen are known to be eliminated from oyster reefs during high inflow / low salinity events, and given that higher summer levels of inflow in the G2-A and G2-B categories, and even those in the springtime, are predicted to continue with some regularity, we believe that the cycle of oyster decline and rejuvenation of the historic period will continue;

f) the larger proportion than recommended of the lower G2-CC level inflows also represents an increase in the prevalence of stressed, albeit not drought, conditions for oysters. The principal concern with the increase in G2-CC years is the evident sequencing of these with other years that are more formally in drought, G2- D and G2-DD, likely hastening the onset of, or lengthening duration of, the already deleterious effects of those years.

g) the incremental impacts of the Guadalupe River run-of-river diversion project, given the assumed infrastructure limits, and subject to the full BBEST instream criteria, are minimal as compared to the concerns and problems already evident in the Region L Baseline;

h) the incremental impacts of the San Antonio River run-of-river diversion project, given the assumed infrastructure limits, and subject to the full BBEST instream criteria, are minimal as compared to the concerns and problems already evident in the Region L Baseline.[30]

Each of the potential impacts to a sound ecological environment noted by the Estuary Subcommittee are offset by the assumption that the full BBEST recommended criteria are in place and that high inflow events will continue to offset the deleterious impact of low-flow periods. **However with the proposed TCEQ rules, these assumptions are not valid and there is no evidence presented by TCEQ that a sound ecological environment would be supported, as potential adverse impacts to water quality, habitat suitability and availability, indices of biologic integrity, estuarine salinity patterns, sediment transport, nutrient delivery and species occurrence, abundance, endangered species, diversity are not protected against with these proposed rules.**

[30] ibid, pg 31-32

TCEQ in their proposed rules argue that high inflow events, such as overbank flows, "*result from naturally occurring large rainfall events, which will likely continue to occur*"[31]. **However, as the proposed rules provide only limited protection for high flow pulses and no protection for overbank flows, such assumptions are not justified.**

Although there currently there are no projects in the Region L plan that would be expected to capture large amounts of these high-flow pulses and overbank flows, such projects certainly could be proposed. The regional plans are revised every five years and no one can guarantee that a project capable of capturing high-flow pulses and overbank flows will not be proposed in the future. In a November 17, 2011 letter, attorneys representing the City of Victoria assert, "*With the current drought, Texas may again have to look at reservoir development*…" [32] Thus any statement that these high-flow events will continue to occur is based not on science, but merely speculation.
We also note that strong standards adopted now can be made less protective in the future if developing water needs justify such a change. However, if inadequately protective standards are adopted now and water rights are issued based on those standards, the water will have been tied up and made unavailable to protect the rivers and bays and the economic activities and livelihoods dependent on those rivers and bays. Thus, it may not be possible in the future to increase the level of protection achieved by the environmental flow standards if inadequately protective standards are adopted now.

The proposed environmental flow standards for the Guadalupe/San Antonio have not been shown to be adequate to support a sound ecological environment. Furthermore, the adoption of flow standards inadequate to achieve that goal is not justified by other considerations. No evaluation by TCEQ staff has been undertaken demonstrating the protectiveness of the proposed standards and their adequacy to protect a sound ecological environment.

I. Modeling

In discussing its balancing process for developing proposed environmental flow standards for the Guadalupe/San Antonio area, 37 TexReg 2528-2529, TCEQ states as follows:

> *The executive director's selected scenario for the balancing analysis is based on a hypothetical diversion of a large amount of water from the Guadalupe River*

[31] 37 TexReg 2526.

[32] Letter from Michael J. Booth (Booth, Ahrens & Werkenthin, P.C.) to Kathleen Ramirez (Texas Commission on Environmental Quality), November 17, 2011.

> *Basin. For this evaluation, the executive director used the commission's WAM for the Guadalupe river basin and modified it by adding the selected scenario. The executive director performed analyses to estimate water availability under three conditions: 1) no environmental flow requirements; 2) application of the commission's current default methodology; 3) application of the stakeholders' recommendation; and 4) application of the proposed environmental flow standard. Applying either no instream flow requirement or the default methodology produces annual availabilities of 59% and 30%, respectively. Application of the stakeholders' recommendation and of the proposed standards produces annual availabilities of less than 5% and 29%, respectively.*

We invested significant effort into understanding and evaluating those analyses using the modeling information that TCEQ staff indicated as being the basis for those statements. Based on those evaluations, which were undertaken with the assistance of an experienced technical expert, we found significant irregularities indicating that the conclusions drawn from that balancing analysis are not supported. For ease of reference the availability information presented in the proposed rule packages is summarized in Table A1 below.

Table A1. The comparison of annual water availability for a theoretical large diversion from the Guadalupe River as used in the Executive Director's efforts to balance human and environmental needs.

Condition	no environmental flow requirements	current default methodology [Lyon's values]	stakeholder recommendations	proposed environmental flow standard
Annual availability as reported in Proposed Stds.§298.380	59%	30%	5%	29%

We requested and received, from the Executive Director's staff, the referenced WAM files for the various "conditions" described above. Upon examination by NWF there are several irregularities or incongruities in the methods used by the executive director in these analyses. These were:

Irregularity A: a mis-match in the spatial location of the theoretical diversion itself and the location of the evaluation of the environmental flow impacts of the diversion under each condition. The theoretical diversion itself, as was revealed within the WAM files and via communication with staff, is located at a site commonly known as H-5 on the Guadalupe River. Neither the science team nor the stakeholder committee of the Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays Bay Basin Area (GSA BBEST & GSA BBASC) recommended environmental flow criteria at

this site. The nearest site with recommendations by both the BBEST and BBASC, is several miles downstream at Gonzales, below the confluence with the San Marcos River, a major tributary of the Guadalupe River, as shown in Figure 1. Thus, flows at the H-5 site do not include contributions from the extensive San Marcos River drainage, which are reflected in the flows at the Gonzales site.

However, the environmental flow parameters in the "proposed environmental flow standard" condition and the "stakeholder recommendations" condition were evaluated by the executive director by simply taking the values proposed/ recommended for the Gonzales site and applying them to the diversion site with no adjustments. Simply applying the environmental flow criteria from Gonzales to this upstream site above the confluence with the San Marcos River is quite inconsistent with stakeholder recommendations and is unlikely to match how standards would be applied. Application in this manner also leads to an inaccurate portrayal of potential impacts to the hypothetical diversion project, as reflect in the annual availability statistics, particularly from the stakeholder committee recommendations. The extent and significance of the inaccuracy of that portrayal are discussed further below.

As shown in Table AA1, the San Marcos River contributes a major portion of the flow at the Gonzales site where the BBEST and BBASC developed recommendations. These contributions often represent 25 to 30 percent of the total flow at Gonzales as measured by monthly averages. Thus the environmental flow criteria for either "condition" developed at Gonzales with higher flows would be difficult to meet at H-5 since flows at the H-5 location would almost always be much lower than those at the Gonzales site. With this spatial mis-match, the lower flows at the H-5 site would more frequently not be adequate to meet the environmental flow criteria developed at Gonzales and thus the theoretical diversion would be barred from withdrawing water much more frequently. The inevitable effect of this mis-match is that a reasonably protective flow standard recommended by the BBASC for the Gonzales site is unfairly portrayed as being unduly restrictive for water supply at the H-5 location because of an inappropriate modeling assumption. By contrast, because the Executive Director apparently developed a proposed standard for the Gonzales site that would result in a more acceptable annual availability at the H-5 location, the mis-match inevitably forced the proposed standard downward to less protective levels.

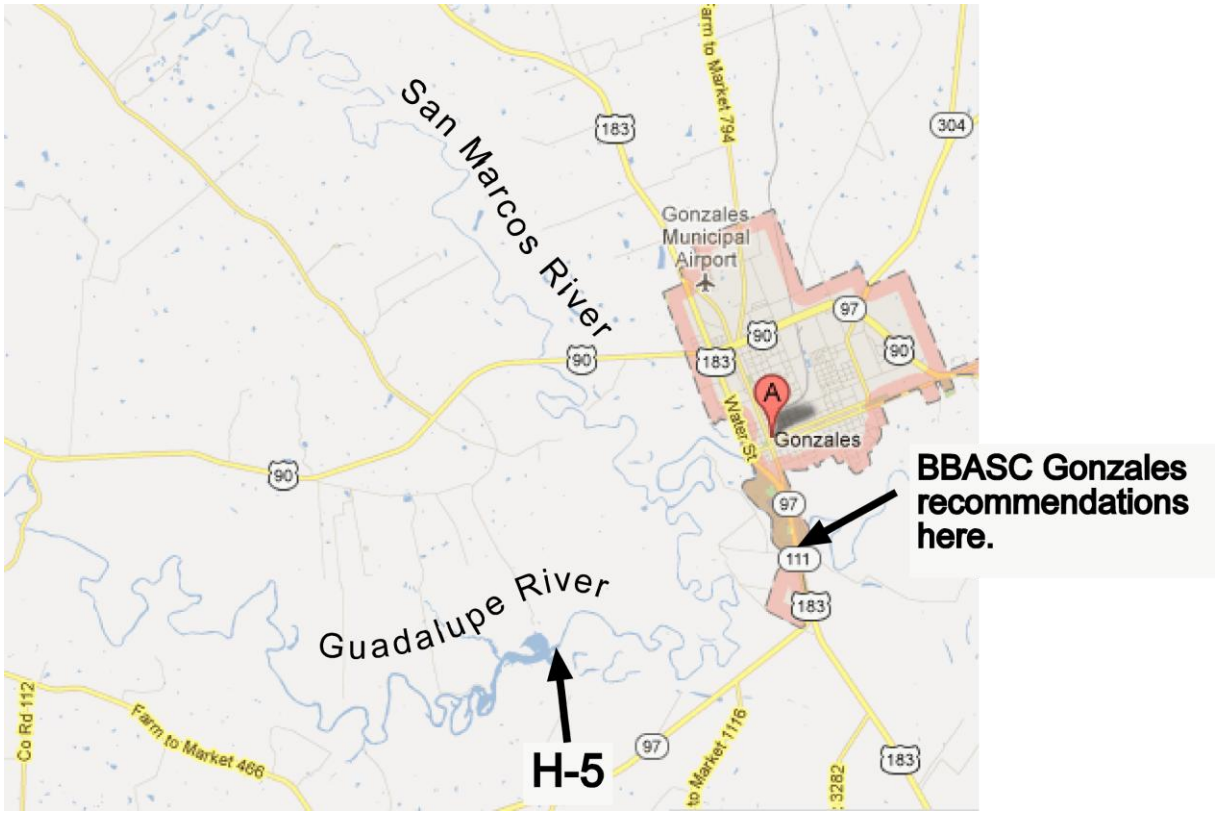

Figure 1. Map showing the relative locations of the Gonzales site and the H-5 site.

Irregularity B: For the Executive Director's evaluation of the condition described as "proposed environmental flow standard", the base flow values utilized in the WAM posted by TCEQ staff as those used in the analyses do not match the base flows listed for the Spring and Summer seasons as "Base" in the Proposed Rules published in the Texas Register. The base flow values set out in Figure: 30 TAC §298.380(6) correspond to the BBASC recommended "Base Wet" values for all four season. However, those used in the WAM for the Spring and Summer seasons correspond to the "Base Average" values recommended by the stakeholders. Table C1 compares these two levels of base flow for the Spring and Summer seasons.

Table C1. The comparison of "Average" base flows values at Gonzales for Spring and Summer seasons as recommended by the GSA BBASC and used in the executive director's analyses of the "proposed environmental flow standards" to the values as published in the Texas Register.

	Spring	Summer
Base flow as proposed [1]	791	727
Base flow used in the executive director's WAM analyses[2]	591	591

Notes: 1) These correspond to Base Wet values for Gonzales as proposed by the GSA BBASC.
2) These correspond to Base Average values for Gonzales as proposed by the GSA BBASC.

These irregularities add additional complications in attempting to understand the purported bases for the proposed rules and, as discussed further below, cause the annual availability values presented in the proposed rules to be an inaccurate portrayal of the effect of the proposed rule and to provide an inaccurate comparison of the proposed rule and the BBASC recommendations.

Questionable Assumption A: The executive director's modeling analyses to balance environmental water needs and other human water supply needs were also performed with no storage feature associated with the theoretical diversion. While this is not an irregular modeling approach in the WAM itself, it is incongruous with other efforts to achieve a balance between water supply and other needs for water in the Guadalupe River basin. It differs from the balancing performed by the stakeholders in which that group examined water supply available with an off-channel reservoir of approximately 105,000 ac-ft capacity. Additionally, many of the potential water supply projects of the Senate Bill 1 Regional Water Planning covering the Guadalupe River basin, indeed all large diversion options, envision a storage component because of the scarcity of reliable flows during drier times. Such off-channel reservoirs range in size from approximately 105,000 - 190,000 ac-ft[33]. A reasonable balancing analysis must consider variations in potential water supply projects that can efficiently develop water supply in compliance with reasonably protective environmental flow standards. Otherwise, it isn't a balancing exercise, it is just a downward adjustment in environmental flow protection.

As illustrated by the Executive Director's analyses, as summarized in the proposed rule package, the annual availabilities achieved for the hypothetical project even with no environmental criteria (59%) applied are quite low. With just the current TCEQ default criteria (Lyon's Method) applied, the annual availability is 30%. The theoretical project as evaluated by the Executive Director does not present a reasonable basis for analysis, and attempting, as the Executive Director appears to have done, to come up with sufficiently weakened proposed standards to increase the annual availability value for the ill-suited hypothetical project up to about the same level as for the Default Methodology is not a reasonable approach. In addition, the downward adjustments from the BBASC recommendations are not justified because the Executive Director's modeling results incorporate significant irregularities that skew the results. Furthermore, the proposed rule is devoid of clear explanation of the bases for the analysis undertaken and the conclusions drawn.

[33] Regional L Water Plan, 2011.

Table AA1. Examining the significance of TCEQ's Incongruous modeling of a new water right by placing it at H-5 but using environmental flow conditions for Gonzales. Comparison of relative flow magnitudes at the two locations. Shown are the monthly average gauged flows from US Geological Survey for the period Oct. 1996 through Oct. 2011.

location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(a) San Marcos Rv. at Luling (USGS 08172000)	414.7	489.1	549.4	454.7	349.0	571.8	764.3	307.4	305.7	732.2	882.2	484.2
(b) Guadalupe Rv. at Gonzales(USGS 08173900)	1420.0	1622.8	1831.1	1655.4	1286.7	1830.2	2683.4	1484.9	1497.1	2586.2	2712.5	1942.1
contribution of San Marcos [a / b] (%)	29%	30%	30%	27%	27%	31%	28%	21%	20%	28%	33%	25%

The National Wildlife Federation performed evaluations to examine the impacts of the two irregularities specified above on the results of the analyses presented by the Executive Director about annual availabilities for the theoretical water supply option. These evaluations utilized, as a beginning point, the executive director's posted WAM files used for the characterizing the proposed standards and the BBASC recommendations.[34] NWF made one or more sequential modifications to those WAM files to address Irregularity A and Irregularity B, as summarized in Table D1. More complete information on these NWF scenarios and the modified WAM files used to examine these can be found in Appendix Hydro1.

Table D1. Summary of scenarios used by National Wildlife Federation's analyses to examine the impacts to water supply of the modeling irregularities present in various environmental flow "conditions" as posited by the executive director.

	Executive director's environmental flow "condition"			
	proposed environmental flow standard		stakeholder recommendations	
NWF scenario number	3A	3B-C	4A	4B
Irregularity addressed in NWF scenario[1]				
A -H-5 v. Gonzales mismatch	pres.	corr.	pres.	corr.
B – wrong base flow	pres.	corr.	NR	NR

notes: NR means the issue is not relevant for that scenario; "pres." means the Irregularity was present in the NWF scenario and not addressed; "corr." indicates that the Irregularity was addressed in the NWF scenario; 1) Because NWF made modification s to the WAM files developed by the executive director, NWF felt it important to proceed very deliberatively, sequentially addressing each Irregularity in turn. A sequence of scenarios addressing each Irregularity can be found in Appendix Hydro1.

Using the Executive Director's model exactly as posted, NWF's expert consultant was able to duplicate the annual availability values listed in the proposed rule package for the no environmental flow requirements, current default methodology, and proposed environmental flow standard conditions. Our result, again running the Executive Director's model exactly as posted, for the stakeholder recommendations condition (7%) was not an exact match for the annual availability value stated in the proposed rule package (5%). NWF's expert consultant then made adjustments to address both of the irregularities, identified above, in the Executive Director's model of the proposed environmental flow standards. To address the H-5 versus Gonzales mismatch in a clear and transparent manner, NWF's modeling assessed compliance with the Gonzales proposed standard at the

[34] For ease of comparison with the Executive Director's results, NWF's modeling is based solely on use of the WAM without incorporation of FRAT. NWF continues to believe the modeling approach utilized during the BBASC process provides the best characterization of project impacts and water availability.

Gonzales site and allowed diversions at the H-5 location when the standards could be met at Gonzales.[35] NWF also substituted the base flow values as actually stated in the proposed rule into the WAM. With those adjustments, the annual availability of the theoretical diversion subject to the proposed rule would be 52% instead of the 29% listed in the Texas Register.

For modeling the Executive Director's version of the stakeholder recommendations, NWF's consultant made the same adjustment as described above to address the H-5 versus Gonzales mismatch. With that adjustment, the annual availability of the theoretical diversion would be 48%, as compared to the 5% availability stated in the Texas Register. These results are summarized in Table BB1.

Table BB1. NWF's revised comparison of annual water availability for a theoretical large diversion from the Guadalupe River for the same environmental flow cases as used in the Executive Director's evaluations.

Condition	no environmental flow requirements	current default methodology [Lyon's values]	GSA BBASC recommendations	proposed environmental flow standard
Annual availability as reported in Proposed Stds.§298.380	59%	30%	5%	29%
NWF's recalculated annual availability statistics [NWF Scenario as in Appendix Hydro1]	59%	30%	48%*	52%
	[1]	[2]	[4B]	[3B-C]

*With the addition of a one-per-year pulse generally as recommended by the BBASC, but with a one-month duration, the annual reliability is 45% [Scenario 4C].

As detailed above, the executive director's analyses to balance human water supply needs and other needs for water were also performed with no storage feature associated with the theoretical diversion. NWF describes this as Questionable Assumption A because it differs

[35] We are not recommending this approach as the standard implementation approach. Consistent with the BBASC recommendations, at Section 4.1.1.5 of the Guadalupe, San Antonio, Mission, and Aransas rivers and Mission, Copano, Aransas, and San Antonio Bays Basin and Bay Area Stakeholders Committee Recommendations Report (September 1, 2011), we support the use of a geographic interpolation approach.

markedly from the balancing efforts performed by the stakeholders as well as from plausible water supply project approaches identified by the Senate Bill 1 Regional Water Planning Group covering the Guadalupe River basin. It is far from clear that the type of hypothetical project evaluated by the Executive Director, which does not include storage, would be sufficiently reliable to be permitted, regardless of flow conditions. To further evaluate the potential impacts of the proposed rules and BBASC recommendations on a hypothetical project at the H-5 location, NWF added an on-channel storage component of 105,000 ac-ft. This reservoir size is as utilized by the Guadalupe-San Antonio stakeholders group for its Mid-Basin Project analysis. NWF did not attempt to optimize or maximize reservoir size at this location. NWF used the same diversion rate from the Guadalupe River as was used by the executive director: a maximum monthly rate of 35,000 ac-ft/month as in the posted WAM files.

Firm yields available under several scenarios are summarized in Table BB2. The executive director's "conditions" of "no environmental flow requirements" and the "current default methodology", initially modeled with no storage, were re-examined by NWF with no other alterations except the addition of storage. Those two scenarios, [1+R and 2+R] led to firm yields of 15,960 ac-ft/yr and 3,850 ac-ft/yr,[36] respectively. For the other two environmental flow "conditions" examined by the executive director, namely the "stakeholder recommendations" and "proposed environmental flow standard", NWF added the reservoir storage feature, made the adjustments detailed above to address Irregularities A and/or B, and some additional adjustments discussed below.

In the case of the representation of the "proposed environmental flow standard," NWF corrected both the H-5 versus Gonzales mis-match on environmental flows, described above as Irregularity A, and the noted difference in base flows for summer and spring seasons described as Irregularity B. The consultant also added the BBASC recommended one-per-year pulse but with the duration set to one month. This NWF scenario is described in Table BB2 and in Appendix Hydro1 as NWF scenario 3C-C+R. With the noted adjustments and the addition of the 105,000 ac-ft of storage, this theoretical project had a firm yield of 15,460 ac-ft/yr.

The very close match of the firm yields of "no environmental flow requirements" case and the case of the "proposed environmental flow standard" suggests that the executive director's proposal actually is providing little practical protection for environmental flow needs.

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[36] The posted materials did not document how TCEQ developed the Lyon's values used for this scenario. Accordingly, it is unclear if that condition includes the H-5 versus Gonzales mismatch. The results reported here for that scenario do not include any adjustments to the TCEQ WAM other than adding the reservoir.

In the case of the representation of the "stakeholder recommendations," NWF corrected the H-5 versus Gonzales mis-match on environmental flows, described above as Irregularity A. For this scenario NWF also added in the stakeholders' recommended one-per-year high-flow pulse with the one month duration.. This NWF scenario is described in Table BB2 and in Appendix Hydro1 as NWF scenario 3C-C+R.The net result of this re-examination of the "stakeholder recommendations" environmental flow conditions with storage is a firm yield 12,410 ac-ft/yr.

Similar to the evaluations and balancing undertaken by the BBASC, these results indicate that the environmental flow standards recommended by the stakeholders are reasonable from a water supply perspective. The BBASC evaluations are based on much more realistic projects than the theoretical project at H-5 evaluated by the Executive Director, even with a storage component added. However, in both instances, the evaluations, when undertaken with appropriate assumptions, indicate that the impact on potential water supply of the BBASC recommended flow standards is very reasonable. Certainly there is some reduction in firm yield for the theoretical project at H-5, when made subject to flow standards generally consistent with BBASC recommendations, but that is to be expected and far from unreasonable. Whether evaluated with or without storage, the BBASC recommended flow standards incorporate significant environmental protection tradeoffs from the BBEST recommendations in order to provide for significant potential for future water supply development. There simply is no reasonable basis for not incorporating recommendations at least as protective as those recommended by the BBASC fully into the environmental flow standards.

Table BB2. Comparison of firm yield that could be developed for a theoretical large diversion from the Guadalupe River and off-channel reservoir at H-5 location. .

Condition	no environmental flow requirements	current default methodology [Lyon's values]#	proposed environmental flow standards*	stakeholder recommendations*
Firm Yield (ac-ft/year)	15,960	3,850	15,460	12,410
[NWF Scenario as in Appendix Hydro1]	[1+R]	[2+R]	[3C-C+R]	[4C+R]

No adjustment was made to the Executive Director's WAM run except for the addition of storage.
*These evaluations both include the addition of a one-per-year high-flow pulse as recommended by the BBASC but with a duration of one month.

II. SPECIFIC COMMENTS ON PREAMBLE AND PROPOSED RULE

These comments are organized by Section Number of the proposed rules. Discussion and comments about language in the preamble that relates to a specific rule provision appears first under the heading for the individual rule. Those discussion and comments about preamble statements are following by specific discussion of the proposed rule and, in many instances, recommended revisions to the proposed rules. As a general convention in order to make the recommended language changes to the rules easier to follow, the language of the rule, as proposed, is reproduced without the underlining or strikeouts in the original proposal. Our recommendations for revisions to the proposed rule are then shown with our recommended additions shown with underlining and our recommended deletions shown with strikeout.

Section 298.290. Schedule for Revision of Standards

Although we strongly support a five-year revision cycle for the environmental flow standards for Subchapter C (Sabine and Neches Rivers, and Sabine Lake Bay) of Chapter 298, we believe the proposed deadline of September 1, 2013 for the submission of stakeholder recommendations is too aggressive to allow for development of information needed to inform revision of the standards. That basically would only allow a time-period of two years from when the work plan was adopted by the stakeholder committee until recommendations for revisions would be due. That deadline should be extended for an additional year.

We do understand the stated goal of attempting to synchronize the flow standards with the regional water planning process, but that synchronization cannot reasonably be accomplished in a single five-year cycle. Instead, we recommend that the deadline for stakeholder recommendations be set for September 1, 2014, with the next set of recommendations being due September 1, 2018. That way, by 2018, the desired synchronization with the regional water planning process would be achieved but this more reasonable timeframe would allow some reasonable potential to gather information and pursue the work plan activities to better inform the revision process. After the 2018 deadline, any subsequent reviews would be due on a five-year cycle.

The proposed rule also proposes to make the revision process contingent on receiving a recommendation from the stakeholder committee that revisions to the environmental flow standards should be pursued. That is not consistent with Section 11.1471(f) of the Water Code. That provision does not make revision of the flow standards contingent on receiving a stakeholder committee recommendation that revisions are needed. The stakeholder committee has established a schedule for validation and refinement of the flow standards

and TCEQ needs to schedule its review consistent with that schedule. However, TCEQ must retain its discretion to decide if revisions to the flow standards should be considered consistent with that schedule. Certainly, it is appropriate to consider input from the stakeholder committee, if it is continuing to operate, about the nature of any proposed revisions. However, it is currently very unclear how active the stakeholder committee will be in the future or even if replacement members will be appointed once the initial five-year terms come to an end.

TCEQ has an obligation to continue to review and revise the environmental flow standards regardless of whether the stakeholder committee continues to function or meet its obligations. As the Texas Legislature found, "the management of water to meet instream flow and freshwater inflow needs should be evaluated on a regular basis and adapted to reflect both improvements in science related to environmental flows and future changes in projected human needs for water."[37] The legislation does contemplate that stakeholder participation must play an ongoing role in that process, but future reviews and revisions may not be made contingent on stakeholder committees, that may not even exist, making recommendations calling for those reviews or revisions. Accordingly, we recommend that the proposed changes to Section 298.290 be revised to read as follows:

§298.290.Schedule for Revision of Standards.
The adopted environmental flow standards or environmental flow set-asides for the Sabine and Neches Rivers, their associated tributaries, and Sabine Lake Bay may be revised by the commission through the rulemaking process. The Sabine and Neches basin and bay area stakeholder committee, or any other entity implementing the work plan, shall submit their review, if any, of the adopted environmental flow standards by September 1, 2014~~3~~, with the next review, if there is one, to be submitted by September 1, 2018, and any subsequent reviews due every five years thereafter. If the ~~stakeholder committee recommends revisions to the adopted environmental flow standards, and the~~ commission determines that revisions to the adopted environmental flow standards are appropriate at the time that reviews are due~~agrees~~, the rulemaking process shall be undertaken in conjunction with the periodic review. The final revised rules arising from a rulemaking undertaken in conjunction with any such periodic review shall be effective within one year after the deadline for the review ~~of the stakeholder's submittal of their review~~ of the adopted environmental flow standards. The rulemaking process shall include participation by a balanced representation of stakeholders having interests in the Sabine and Neches Rivers, their associated tributaries, and Sabine Lake Bay.

[37] Tex. Water Code §11.0235(d-5).

Section 298.305 Definitions

In the preamble discussion for this section, 37 TexReg 2523, TCEQ acknowledges that overbank flows and flushing flows for the bays and estuaries are considered to be components of a flow regime for a sound ecological environment. However, that discussion goes on to state that because such flows result from naturally occurring large rainfall events, which will likely continue to occur, the Commission is not including overbank flows or flushing flows as a component of the standards. That omission is unjustified.

It certainly is true that large rainfall events are likely to continue. Indeed, in the absence of continuing rainfall events, none of the standards will provide meaningful environmental benefit. However, the statement misses the point. A key purpose of the standards is to protect such events when they do occur in the future from being unduly altered by new impoundment or diversion facilities. New, large on-channel reservoirs have the potential to dramatically alter flows, including overbank flows or flushing flows. Absent a showing that protecting such ecologically important flows, which are necessary to protect a sound ecological environment, is not achievable because that protection would result in an unreasonable adverse impact to other public interests, the flow standards must include such protection. The proposed rule package provides no such justification for omission of the flows recommended by the CL BBASC for protection, although as noted below, in a couple of instances some minor adjustments may be appropriate.

Section 298.305 (4)

The definition of "dry condition" should specify that the approximately 20% of time being referenced is the drier period of time that does not include severely dry conditions rather than simply any 20% of time. Similarly, as applicable to the Colorado River below Lake Travis, dry conditions should be acknowledged as representing the 45% of time when conditions are drier than during average conditions but not as dry as severe conditions. Accordingly, the commenting parties recommend that the definition of "dry condition" be revised to read as follows:

(4) Dry condition--for all measurement points except those measurement points on the Colorado River below Lake Travis, the hydrologic condition that would occur approximately 20% of the time and that is intended to represent periods when conditions are dry but not severe. For all measurement points on the Colorado River below Lake Travis, the hydrologic condition that would occur approximately 45% of the time and that is intended to represent periods when conditions are drier than average conditions but not severe.

Section 298.305 (6)

The definition of "fall inflow quantity" should make clear that it is referring to the maximum amount during any three consecutive months in the defined period during a particular calendar year. As drafted, it seems to refer to the maximum amount during three consecutive months in any year in the historical record. Accordingly, the commenting parties recommend that the definition of "fall inflow quantity" be revised to read as follows:

(6) Fall inflow quantity—during any individual calendar year, the maximum freshwater inflow quantity, at the most downstream point in the Lavaca River Basin and at the most downstream point on Garcitas Creek in the Lavaca-Guadalupe Coastal Basin, occurring during any period of three consecutive months beginning in the months of August, September, or October.

Section 298.305 (7)

The definition of "fall season quantity" should make clear that it is referring to the maximum amount during any three consecutive months in the defined period during a particular calendar year. As drafted, it seems to refer to the maximum amount during three consecutive months in any year in the historical record. Accordingly, the commenting parties recommend that the definition of "fall season quantity" be revised to read as follows:

(7) Fall season quantity—during any individual calendar year, the maximum freshwater inflow quantity, at the most downstream point in the Colorado River Basin, occurring during any three consecutive months during the period from August through December, inclusive.

Section 298.305 (10)

The definition of "inflow regime level" should include a reference to the regimes defined in Figures 30 TAC §298.330(a)(2) and 298.330 (c). Otherwise, it is unclear that those specific patterns are being referred to. In addition, the terminology in those figures varies slightly and the definition should track the terminology used. Accordingly, the commenting parties recommend that the definition of "inflow regime level" be revised to read as follows:

(10) Inflow regime level—one of the annual freshwater inflow patterns,

(A) at the most downstream point in the Colorado River Basin for Matagorda Bay that includes a spring season quantity, a fall season quantity, and an intervening season quantity as described in Figure 30 TAC §298.330(a)(2), or

(B) at the most downstream point in the Lavaca River Basin and the most downstream point on Garcitas Creek in the Lavaca-Guadalupe Coastal Basin for Lavaca Bay,

that includes a spring inflow ~~season~~ quantity, a fall inflow ~~season~~ quantity, and an intervening inflow ~~season~~ quantity as described in Figure 30 TAC §298.330(c).

Section 298.305 (14)
The definition of "severe condition" should specify that the approximately 5% of time being referenced is the driest period of time rather than simply any 5% of time. Accordingly, the commenting parties recommend that the definition of "severe condition" be revised to read as follows:

(14) Severe condition--for all measurement points, the hydrologic condition that would occur approximately 5% of the time and that is intended to represent the driest periods.

Section 298.305 (16)
The definition of "spring inflow quantity" should make clear that it is referring to the maximum amount during any three consecutive months in the defined period during a particular calendar year. As drafted, it seems to refer to the maximum amount during three consecutive months in any year in the historical record. Accordingly, the commenting parties recommend that the definition of "spring inflow quantity" be revised to read as follows:
(16) Spring inflow quantity--during any individual calendar year, the maximum freshwater inflow quantity, at the most downstream point in the Lavaca River Basin and at the most downstream point on Garcitas Creek in the Lavaca-Guadalupe Coastal Basin, occurring during any period of three consecutive months beginning in the months of February, March, April, or May.

Section 298.305 (17)
The definition of "spring season quantity" should make clear that it is referring to the maximum amount during any three consecutive months in the defined period during a particular calendar year. As drafted, it seems to refer to the maximum amount during three consecutive months in any year in the historical record. Accordingly, the commenting parties recommend that the definition of "spring season quantity" be revised to read as follows:

(17) Spring season quantity-- during any individual calendar year, the maximum freshwater inflow quantity, at the most downstream point in the Colorado River Basin, occurring during any three consecutive months during the period from January through July, inclusive.

Section 298.305 (20)

The definition of "wet condition" should specify that the approximately 25% of time being referenced is the wettest period of time rather than simply any 25% of time. Accordingly, the commenting parties recommend that the definition of "wet condition" be revised to read as follows:

(20) Wet condition--for all measurement points except those measurement points on the Colorado River below Lake Travis, the hydrologic condition that would occur approximately 25% of the time and that is intended to represent the wettest conditions.

Section 298.310. Findings.

Section 298.310 (b):
This provision does not accurately track the proposed rules. The use of multiple levels of base flows and multiple levels of pulse flows should be acknowledged as representing Accordingly, the commenting parties recommend that Subsection (c) be revised to read as follows:

(b) For the Colorado and Lavaca Rivers, and their associated tributaries, the commission finds that these sound ecological environments can best be maintained by a set of flow standards that implement a schedule of flow quantities that contain subsistence flow, multiple levels of base flow, and multiple levels of high flow pulses at defined measurement points. ~~Minimum~~ Flow levels protected by ~~for~~ these components will vary by season and by year in accordance with hydrologic condition indicators ~~since the amount of precipitation and, therefore, whether a system is in subsistence or base flow conditions, will vary from year to year and within a year from season to season,~~ and the number of pulses protected will also vary with the amount of precipitation.

Section 298.310 (c). This section does not currently acknowledge that the proposed inflow standards for Matagorda Bay and Lavaca Bay include freshwater inflow quantities that not only vary by season but also from year to year. Because that variation was considered important by the CL BBEST and CL BBASC and, apparently, acknowledged by TCEQ in proposing the standards, subsection (c) should acknowledge the importance of that aspect of the standards. In addition, this provision should acknowledge the importance of targets for implementation of strategies to increase inflows above levels expected with full exercise of existing water rights. Accordingly, the commenting parties recommend that Subsection (c) be revised to read as follows:
(c) For Matagorda and Lavaca Bays, the commission finds that the sound ecological environment of Matagorda and Lavaca Bays can best be maintained by a set of freshwater inflow standards that include freshwater inflow quantities that vary by season and from

year to year and that incorporate targets for implementing strategies to increase inflow regime level achievement above the frequencies expected with full exercise of existing water rights.

Section 298.310, generally.

This section fails to include any findings regarding East Matagorda Bay. Indeed, the proposed rules fail to address protection of inflows to East Matagorda Bay in any fashion. Because there are no gaged inflows to East Matagorda Bay, the CL BBASC was not able to develop recommendations for quantified inflow standards. However, the CL BBASC did identify conditions in East Matagorda Bay as being of particular concern and did recommend a narrative standard for protection of inflows to East Matagorda Bay. The CL BBASC stated two key concepts regarding inflows to East Matagorda Bay. First, the BBASC recommended that future reductions of inflows that can be avoided, should be avoided.[38] The BBASC did recognize that reductions in irrigation return flows may cause unavoidable declines in inflows. The second key concept that the BBASC noted is that affirmative action should be taken in the form of strategies to provide increased freshwater inflows to East Matagorda Bay: "Strategies to maintain and increase freshwater inflows should be pursued to support a sound ecological environment within East Matagorda Bay."[39] It is not appropriate for the rules to ignore this ecologically important bay that has, in the past, supported significant commercial fishery activity.

Accordingly, the commenting parties recommend that a new Subsection (d) be added to Section 298.310 to read as follows:

(d) Although not adopting quantified environmental flow standards specifically applicable to East Matagorda Bay, the commission does find that, in order to provide a sound ecological environment in East Matagorda Bay, reductions in inflows from new authorizations should be avoided and strategies to maintain and increase freshwater inflows should be pursued.

Section 298.320. Calculation of Hydrologic Conditions.

We appreciate the obvious attempt by TCEQ to reflect stakeholder committee recommendations in the development of the hydrologic condition provisions. One particular aspect of the proposed revisions needs further development. Consistent with the CL BBASC recommendations, Subsections (b)-(d) of this section set out the initial hydrologic condition indicators to be used in governing permit operations for permits

[38] Colorado and Lavaca Basin and Bay Stakeholder Committee Environmental Flows Recommendation Report, at p. 117 (August 2011).
[39] Id.

subject to these standards. The proposed rules also distinguish between those hydrologic condition indicators and the indicators to be used in making water availability determinations for permitting. The point that needs to be clarified is the inclusion of an explanation of the need to provide for ongoing, periodic revisions of the hydrologic condition indicators set out in Subsections (b)-(d). As explained in the CL BBASC report, permits subject to these standards must include appropriate conditions for implementing such revisions.[40] Accordingly, we recommend that a new Subsection (g) be added to this section to provide as follows:

(g) The hydrologic condition indicators set out in Subsections (b) – (d) are intended for use to govern the operations of permits subject to this Subchapter during the initial period, of not longer than ten years, until the environmental flow standards in this Subchapter are amended. Those indicators were calculated to achieve compliance with the percentages of time stated in Subsections (e) and (f). The hydrologic condition indicators set out in Subsections (b)-(d) will be recalculated periodically, no less frequently than once every ten years, in order to achieve, to the greatest extent possible, compliance with the percentages of time stated in Subsections (e) and (f) on an ongoing basis. Permits subject to these standards shall include special conditions providing for the periodic recalculation of the applicable hydrologic conditions in accordance with this provision.

Section 298.325. Schedule of Flow Quantities.

In the preamble discussion for this section, found at 37 TexReg 2524 in the last sentence of the second-to-last paragraph, TCEQ states that compliance with a high flow pulse would be considered to satisfy the requirements for smaller higher flow pulse requirements during the same season. That statement is overbroad because it suggests that, for example, a single large seasonal pulse could satisfy the requirement for two smaller seasonal pulses in the same season. That result would not be consistent with the CL BBEST or CL BBASC recommendations or with protection of a sound ecological environment. The commenting parties do agree that a larger pulse occurring during a season should be considered to satisfy the requirements for one pulse in each smaller pulse tier during that same season. The actual language of proposed Section 298.325 (d)(6) appears to be consistent with both the CL BBEST and CL BBASC recommendations, but inconsistent with the referenced discussion in the preamble. The preamble language should be revised to be consistent with the proposed rule in that respect in order to avoid unnecessary ambiguity.

Section 298.325 (c):

[40] Colorado and Lavaca Basin and Bay Stakeholder Committee Environmental Flows Recommendation Report, at p. 42 (August 2011).

There is some ambiguity in the proposed language about what base flow criterion applies during severe hydrologic conditions. Nothing in §298.325 (b) addresses what happens during severe hydrologic conditions when flows are above the applicable base flow level. Although the language recommended for addition here arguably could reasonably be inferred from the figures included in Subsection (e) of Section 298.325, it would be preferable to minimize potential ambiguity. As a result, it is important to address that issue clearly in this subsection. Accordingly, the commenting parties recommend that Subsection (c) be revised to read as follows:

(c) Base flow. The applicable base flow level varies depending on the seasons as described in §298.305 of this title and the hydrologic condition described in §298.320 of this title (relating to Calculation of Hydrologic Conditions). For a water right holder to which an environmental flow standard applies, at a measurement point that applies to the water right, the water right holder is subject to the base flow standard for the hydrologic condition prevailing at that time. For all measurement points except those on the Colorado River below Lake Travis, the water right will be subject to one of the following: a dry, an average, or a wet base flow standard. For all measurement points on the Colorado River below Lake Travis, the water right will be subject to either a dry or an average base flow standard. <u>For all measurement points, the dry base flow standard applies during severe hydrologic conditions.</u> For a water right holder to which an environmental flow standard applies, at a measurement point that applies to the water right, when the flow at the applicable measurement point is above the applicable base flow standard, but below any applicable high flow pulse levels, the water right holder may store or divert water according to its permit, subject to senior and superior water rights, as long as the flow at the applicable measurement point does not fall below the applicable base flow standard for that hydrologic condition.

Section 298.330. Environmental Flow Standards.

The preamble discussion, which is found at 37 TexReg 2525 in the fifth sentence of the second full paragraph on that page, seems to suggest that the stakeholders intended to allow occurrence frequencies for specified inflow levels to change as new permits are issued. If applied literally, that likely would obviate all protection afforded by the inflow standards. Fortunately, the actual proposed rule language, at Section 298.330 (a)(2) and Section 298.330 (c), appears to be consistent with stakeholder intent not to allow occurrence frequencies for the specified inflow regimes to decrease as a result of the issuance of new permits or new appropriations. The CL BBASC recognized that other changes in how the modeling is done, period of record used, or how existing permits are operated may cause some level of change in occurrence frequencies and sought to accommodate that subtle type of change. The preamble language should be clarified to be

consistent with the proposed rule in that respect in order to avoid creating unnecessary ambiguity.

The preamble discussion, which is found at 37 TexReg 2525 in the third full paragraph on that page, indicates that the CL BBASC recommended pulse trigger levels that equal flood stage levels. That is not accurate, with two apparent inadvertent exceptions.[41] The CL BBASC reduced its recommended pulse triggers for large pulses from the levels recommended by the CL BBEST to be below the lowest National Weather Service (NWS) indicated flood stage levels. This was a subject of much discussion and difficult compromise among the stakeholders. The CL BBASC acknowledged the important ecological role played by large pulses, including overbank flows. For example, the BBASC noted that overbank flows clear large in-channel debris, help move sediments, provide connections for aquatic organisms and seeds to reach floodplain areas, and help provide essential sediments and nutrients to estuaries.[42] However, because of concerns about potential damage and harm that can accompany large overbank flows in some situations and in order to achieve consensus, the CL BBASC did not recommend protection for overbank flows, or, more specifically, flows that would exceed National Weather Service flood stage, and adjusted its recommendations for large pulse flows accordingly.

NWS defines flood stage as "an established gage height for a given location at which a rise in water surface level <u>begins</u> to impact lives, property, or commerce. The issuance of flood (and in some cases flash flood) warnings is linked to flood stage. Not necessarily the same as bankfull stage."[43] (emphasis added). That preamble discussion also states that the CL BBASC intended the pulse trigger levels to represent bankfull events, which is true. However, that discussion fails to reflect that the use of the term bankfull pulse is described in the CL BBASC report as referring to "a pulse up to the flood stage." CL BBASC report at p. 39. Thus, the CL BBASC sought to protect as much of the overbank pulse function as possible without actually protecting flood level pulses.

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[41] With assistance from the CL BBEST, the CL BBASC adjusted pulse triggers downward to avoid recommending protecting overbank flows or flows that equaled or exceeded NWS flood stage levels. As shown in Table 1 in these comments, the CL BBASC recommendations achieved that result with two possible exceptions. The largest pulse trigger levels for the San Saba River at San Saba and for Garcitas Creek near Inez appear to equal, or even slightly exceed, the minor flood stage levels at those locations. Consistent with CL BBASC intent, those triggers should be adjusted downward to be slightly below the minor flood stage levels.

[42] Colorado and Lavaca Basin and Bay Stakeholder Committee Environmental Flows Recommendation Report, at p. 38 (August 2011).

[43] National Weather Service Manual 10-950 (Nov. 6, 2010) at p. 3. Copy attached as Appendix NWS-1.

The preamble discussion notes that the "commission reduced the trigger levels for some high flow pulses to the action stage level to ensure that application of the standards would not cause flooding." First, application of the standards will never "cause" flooding because the standards do not require the creation of a pulse. Flooding would occur only as a result of naturally driven rainfall events. Second, the CL BBASC engaged in a long and careful discussion about striking a reasonable balance between achieving as much of the function of an overbank flow as possible without specifically recommending protection of a flood level flow. The CL BBASC accomplished that goal by unanimously recommending the protection, but not the creation[44], of pulse flows that approach, but do not reach or exceed, flood stage. The relationship of the CL BBASC recommended high flow pulse triggers to CL BBEST recommendations and to NWS minor flood stage levels and TCEQ proposed pulse triggers is shown in Table 1 below. Third, "action stage," as defined by the NWS, signifies a flow level at which preparations for response to a flood event are appropriate because of rising levels in a stream or other water body. As recommended by the CL BBASC, flow rates actually reaching flood stage levels would be subject to diversion or impoundment.[45] Fourth, TCEQ reduced all aspects of the pulses, including volume and duration, not just the trigger levels down to volumes and durations far below those recommended by the CL BBASC.

Even if TCEQ were able to justify the reduction in trigger size in order to prevent the protection of flood level flows, TCEQ has provided no justification for its proposed reductions in volume or duration of the high flow pulses below the levels recommended by the CL BBASC. In addition, TCEQ has failed to justify the reductions in pulse trigger levels that it has proposed.

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[44] TCEQ staff noted at a meeting on April 9, 2012, at which the proposed rules were discussed, that strategies could be pursued to produce pulse flows. It is true that it would be possible, in theory, to attempt to reach a voluntary agreement with a reservoir operator to make releases from a reservoir in a way that might produce a pulse large enough to create a flood flow. However, such an arrangement would be independent of the adoption of environmental flow standards and would be subject to other regulatory requirements. In addition, as noted in the main text of the comments, the pulse flow magnitudes recommended by the CL BBASC do not represent flood stage flows.

[45] In order to be consistent with the intent of the CL BBASC, we do support adjusting the highest pulse trigger levels for the San Saba River at San Saba and for Garcitas Creek near Inez measurement points slightly below the levels set out in the stakeholder report in order to avoid protecting a pulse flow level that equals the minor flood stage for those locations. Accordingly, we recommend that the largest high flow pulse trigger for the San Saba River at San Saba site be set at 10,000 cfs and that the highest flow pulse trigger for Garcitas Creek at Inez be set at 3,500 cfs.

Table 1. Comparison of BBASC Largest Pulse Trigger to NWS Flood Stage and TCEQ Proposed Triggers				
Measurement Point	Largest BBEST Pulse Trigger	Largest BBASC Pulse Trigger	NWS Minor Flood Stage Level[46]	Largest TCEQ Pulse Trigger
Colorado River above Silver	8,100 cfs	4,500 cfs	4,700 cfs	3,000 cfs*
Colorado River near Ballinger	12,300 cfs	4,500 cfs	4,900 cfs	3,200 cfs
Colorado River near San Saba	39,600 cfs	39,600 cfs	42,900 cfs	18,900 cfs*
Elm Creek at Ballinger	6,300 cfs	6,100 cfs	6,200 cfs	1,900 cfs*
Concho River at Paint Rock	12,300 cfs	12,300 cfs	35,400 cfs**	3,000 cfs*
South Concho River at Christoval	2,600 cfs	2,600 cfs	8,400 cfs	420 cfs*
Pecan Bayou near Mullin	13,900 cfs	13,900 cfs	32,400 cfs	3,500 cfs*
San Saba River at San Saba	14,900 cfs	10,500 cfs	10,500**	5,500 cfs*
Llano River at Llano	41,100 cfs	15,000 cfs	18,370 cfs**	9,100 cfs*
Pedernales River at Johnson City	26,300 cfs	10,000 cfs	11,735 cfs**	6,980 cfs
Onion Creek near Driftwood	3,600 cfs	3,600 cfs		1,200 cfs*
Colorado River at Bastrop	>30,000 cfs	27,000 cfs	>32,500 cfs**	8,000 cfs
Colorado River at Columbus	>30,000 cfs	27,000 cfs	>42,400 cfs**	27,000 cfs
Colorado River at Wharton	>30,000 cfs	27,000 cfs	>45,000 cfs**	27,000 cfs
Lavaca River near Edna	22,800 cfs	6,000 cfs	6,100 cfs**	4,500 cfs
Navidad River at Strane Park	15,500 cfs	4,900 cfs	5,200 cfs	2,500 cfs
Sandy Creek near Ganado#	8,300 cfs	5,800 cfs	5,900 cfs**	2,200 cfs
East Mustang Creek near Louise	2,200 cfs	1,500 cfs	1,600 cfs	1,000 cfs
West Mustang Creek nr Ganado	6,700 cfs	6,700 cfs	7,500 cfs**	1,000 cfs
Garcitas Creek near Inez	5,400 cfs	3,700 cfs	3,665 cfs**	380 cfs
Tres Palacios River near Midfield	6,700 cfs	2,400 cfs	2,550 cfs**	2,000 cfs

*These TCEQ pulse sizes were limited by decision not to include pulses larger than 1-per-year rather than by TCEQ's use of NWS action stage levels.
#NWS lists as Sandy Creek near Cordele.
** Value determined by extrapolation from NWS data.

TCEQ also notes that it did not propose protection for pulse flows with return periods in excess of one year, other than for the Colorado River below Lake Travis. The stated basis

[46] The flood stage levels were obtained from the flood stage charts available on the National Weather Service website. See, e.g., http://water.weather.gov/ahps2/hydrograph.php?wfo=hgx&gage=what2&hydro_type=2. Printouts of those charts are included in Appendix NWS-2.

for not protecting those flows is the absence of site-specific studies supporting those specific pulse flow levels and frequencies. S.B. 3 does not contemplate requiring new intensive site-specific studies. A key concept of S.B. 3 is to make the best decisions possible based on currently available scientific information and then develop additional information and make appropriate adjustments in the future. The preamble also indicates that the Executive Director reviewed the availability of unappropriated flows and determined that increasing volumes and frequencies of pulses reduces the amount of remaining unappropriated flow. That is, of course, true, but also basically a meaningless statement. Protecting any amount of water for the environment necessarily reduces the amount of water available for appropriation. Indeed, without a willingness to have some reasonable reductions in water available for appropriation, this would be a meaningless process. On the one hand, TCEQ contends that it isn't necessary to protect pulses because large rainfall events and, therefore, pulses will continue to occur. However, that would only be true if large projects were not built to capture those pulses. If such projects are not built, then there is no need to worry about reducing the amount of unappropriated water that could be captured by harvesting those pulses. TCEQ seems to be arguing both sides of that issue. On the one hand, TCEQ says it won't include protection for large pulses because then unappropriated water would be reduced and future projects that might seek to capture those pulses could not be permitted. On the other hand, TCEQ argues that there is no environmental harm associated with failing to include protection for such pulses because they will continue to occur. It can't work both ways. It is clear that the continued occurrence of large pulses is essential for protecting a sound ecological environment. TCEQ has not justified its failure to include protection for those pulses, especially up to the levels recommended by the CL BBASC.

Section 298.330 (a):

The CL BBASC was quite clear in its unanimous recommendations for protection of inflows from the Colorado River to Matagorda Bay. The CL BBEST recommendations for Matagorda Bay inflows that formed the starting point for BBASC deliberations were based on extensive scientific studies. One key aspect of the negotiations and compromise that lead to the unanimous BBASC recommendations was recognition that existing water rights had already severely compromised inflow levels to Matagorda Bay below the amounts considered to be adequate to support a sound ecological environment. Accordingly, the CL BBASC unanimously recommended that new permits and amendments to increase the amount of water stored, taken, or diverted from the Colorado River Basin be subject to certain limits based on not further worsening attainment frequencies for certain inflow regimes, including not being allowed to divert during months that inflows from the Colorado River to Matagorda Bay were less than 15,000 acre-feet. Although the proposed rules do capture key aspects of other CL BBASC recommendations related to protection of

inflows to Matagorda Bay from the Colorado River, that latter aspect was omitted. It is missing from the proposed rules and the omission is not acknowledged in the preamble discussion. When asked about the omission at an April 9, 2012 meeting where the proposed rules were discussed, TCEQ staff representatives indicated that the 15,000 acre-feet minimum inflow requirement was not included because explicit protection was not considered necessary.

It is our understanding, although limited in the absence of an actual written explanation in the proposed rule, that the staff comment was intended to suggest that, because of limited water availability, new permits are unlikely to be able to divert at those times without impairing existing rights. In any event no case has been made that explicit protection of the 15,000 acre-feet minimum monthly inflow in the standards is not needed to protect a sound ecological environment or that including such protection would be unreasonable because of adverse impacts on other public interests. It, certainly, is true that no justification has been provided in the rulemaking process for the failure to include that protection. We are not aware of any showing that including that protection would be inappropriate based on any unreasonable impacts on competing needs for water. Even if it were true that existing permits would prevent such diversions, permits can get amended, cancelled, or abandoned resulting in the potential for additional diversions by new permits. As just one example of that potential, the latest major permit issued in the Colorado Basin, Permit 5731 issued to the Lower Colorado River Authority (LCRA), includes a provision providing for the abandonment of the permit if certain actions aren't taken by a time certain. Furthermore, there are no permit conditions in that permit that specifically limit diversions based on a 15,000 acre-foot minimum monthly inflow from the Colorado River to Matagorda Bay. Thus, it would be inappropriate to rely on that permit as the basis for contending that explicit protection of the 15,000 acre-foot minimum inflow is not needed. The rules should include specific language protecting a minimum monthly inflow quantity of 15,000 acre-feet to Matagorda Bay as part of the environmental flow standards. Accordingly, we recommend, consistent with the unanimous CL BBASC recommendations, that Subsection (a) of Section 298.330 of the rules be revised by including the changes shown below:

(a) A water right application in the Colorado River Basin which increases the amount of water authorized to be stored, taken or diverted as described in §298.10 of this title (relating to Applicability) shall not cause or contribute to an impairment of the inflow regimes as described in the figure in this subsection. Impairment of the inflow regime shall be evaluated as part of the water availability determination for a new water right or amendment that is subject to this subchapter. For purposes of this subsection, impairment

would occur if the application, when considered in combination with any authorizations subject to this subchapter, which were issued prior to this application, would:

(1) decrease the annual average freshwater inflow, at the most downstream point in the Colorado River Basin, below 60% of the long-term annual strategy quantity listed in Figure: 30 TAC §298.330(a)(2); ~~or~~

(2) decrease the modeled annual frequency of any inflow regime; or

(3) result in diversions during a month that a monthly inflow quantity of at least 15,000 acre-feet to Matagorda Bay from the Colorado River is not achieved.

Section 298.330 (b):

Generally, the language of proposed Section 298.330 (b) closely matches the CL BBASC recommendations. However, one aspect of that language is problematic. As drafted, the language could be read as indicating that improvements in inflows as a result of the implementation of strategies would only be protected if those improvements actually fully meet the freshwater inflow standards rather than if they merely incrementally help to get closer to meeting those standards. The commenting parties hope that TCEQ's intent is to protect incremental improvements along the path to meeting the standard because proceeding in incremental steps will be essential. That certainly is what the CL BBASC intended. Accordingly, the commenting parties recommend that Subsection (b) be revised to read as follows:

(b) To the extent that strategies are implemented through a water right permit or amendment to help meet the freshwater inflow standards for Matagorda Bay, a water right application in the Colorado River Basin which increases the amount of water authorized to be stored, taken, or diverted as described in §298.10 of this title shall not reduce the long-term annual strategy quantity or the modeled annual frequency for any inflow regime level listed in Figure: 30 TAC §298.330(a)(2) below the long term annual strategy quantity or modeled annual frequency that would occur in the commission's water availability model with the permitted strategy or strategies in place.

Section 298.330 (d):

Generally, the language of proposed Section 298.330 (d) closely matches the CL BBASC recommendations. However, several aspect of that language are problematic. First, just as for Subsection (b), the language could be read as indicating that improvements in inflows as a result of the implementation strategies may only be protected if those improvements actually meet the freshwater inflow standards rather than if they merely incrementally

help to get closer to meeting those standards. Second, the term "inflow regime level" does not appear in Figure: 30 TAC §298.330(c). In that figure, the term "inflow regime" is used and the different regimes are simply referred to as "subsistence," "base dry," "base average," and "base wet." Thus, no inflow regime levels are actually listed in the Figure. In addition, the inclusion of the term "level" at two places, with two different meanings, in the subsection introduces unnecessary ambiguity about what the second reference to "level" is referring to. Accordingly, the commenting parties recommend that Subsection (d) be revised to read as follows:

(d) To the extent that strategies are implemented through a water right permit or amendment to <u>help</u> meet the freshwater inflow standards for Lavaca Bay, a water right application in the Lavaca River Basin, or on Garcitas Creek in the Lavaca-Guadalupe Coastal Basin, which increases the amount of water authorized to be stored, taken, or diverted as described in §298.10 of this title, shall not reduce the modeled annual frequency in the commission's water availability model for any inflow regime level <u>described</u> ~~listed~~ in Figure: 30 TAC §298.330(c) below the <u>frequency</u> ~~level~~ that would occur with the permitted strategy or strategies in place.

Section 298.330 (e):
As discussed above, the commission has not justified the failure to include in the proposed rules, protection for pulse flows at least of the size and frequency unanimously recommended by the CL BBASC. The CL BBASC undertook a careful balancing exercise, which resulted in very large reductions in recommendations for pulse size below the levels identified by the CL BBEST as being adequate to protect a sound ecological environment. With the limited exception of the trigger level for the largest pulses at the San Saba River at San Saba and the Garcitas Creek near Inez sites, which should be adjusted as discussed below, the rules should include pulse protections at least as protective as those unanimously recommended by the CL BBASC. Those pulse sizes are all below flood stage levels. Specific recommended revisions to the proposed rules to increase pulse flow protections are set out below.

Recommended revision to Figure: 30 TAC §298.330(e)(1), add a one-per-two-year pulse with a trigger level of 4,500 cfs, a volume of 20,400 acre-feet, and a duration of 18 days.

Recommended revision to Figure: 30 TAC §298.330(e)(2), for the annual pulse, restore the trigger level to 4,500 cfs, with a volume of 18,300 acre-feet, and a duration of 13 days.

Recommended revision to Figure: 30 TAC §298.330(e)(3), add a one-per-two-year pulse with a trigger level of 30,400 cfs, a volume of 222,200 acre-feet, and a duration of 28 days

and add a one-per-five-year pulse with a trigger level of 39,600 cfs, volume of 300,500 acre-feet, and a duration of 31 days.

Recommended revision to Figure: 30 TAC §298.330(e)(4), add a one-per-two-year pulse with a trigger level of 3,500 cfs, a volume of 13,000 acre-feet, and a duration of 20 days and add a one-per-four-year pulse with a trigger level of 6,100 cfs, volume of 21,909 acre-feet, and a duration of 21 days.

Recommended revision to Figure: 30 TAC §298.330(e)(5), add a one-per-two-year pulse with a trigger level of 5,200 cfs, a volume of 23,400 acre-feet, and a duration of 23 days and add a one-per-five-year pulse with a trigger level of 12,300 cfs, volume of 55,300 acre-feet, and a duration of 29 days.

Recommended revision to Figure: 30 TAC §298.330(e)(6), add a one-per-two-year pulse with a trigger level of 930 cfs, a volume of 2,800 acre-feet, and a duration of 10 days and add a one-per-five-year pulse with a trigger level of 2,600 cfs, volume of 6,800 acre-feet, and a duration of 11 days.

Recommended revision to Figure: 30 TAC §298.330(e)(7), add a one-per-two-year pulse with a trigger level of 6,700 cfs, a volume of 54,100 acre-feet, and a duration of 33 days and add a one-per-five-year pulse with a trigger level of 13,900 cfs, volume of 124,900 acre-feet, and a duration of 43 days.

Recommended revision to Figure: 30 TAC §298.330(e)(8), add a one-per-two-year pulse with a trigger level of 9,000 cfs, a volume of 45,300 acre-feet, and a duration of 24 days and add a one-per-three-year pulse with a trigger level of 10,000 cfs, volume of 53,032 acre-feet, and a duration of 25 days. [The trigger level for one-per-three-year pulse is adjusted downward from the BBASC recommendation to avoid potentially protecting a flood level flow.]

Recommended revision to Figure: 30 TAC §298.330(e)(9), add a one-per-two-year pulse with a trigger level of 15,000 cfs, a volume of 89,300 acre-feet, and a duration of 22 days.

Recommended revision to Figure: 30 TAC §298.330(e)(10), add a one-per-two-year pulse with a trigger level of 10,000 cfs, a volume of 44,600 acre-feet, and a duration of 17 days.

Recommended revision to Figure: 30 TAC §298.330(e)(11), add a one-per-two-year pulse with a trigger level of 2,400 cfs, a volume of 18,900 acre-feet, and a duration of 45 days and

add a one-per-five-year pulse with a trigger level of 3,600 cfs, volume of 29,600 acre-feet, and a duration of 53 days.

Recommended revision to Figure: 30 TAC §298.330(e)(12(B), add a one-per-two-year pulse with a pulse magnitude of 27,000 cfs and a duration of 2 days.

Recommended revision to Figure: 30 TAC §298.330(e)(15), for the large seasonal pulse for the spring season, restore the trigger level to 6,000 cfs and the volume to 26,600 acre-feet; and for the annual pulse, restore the trigger level to 6,000 cfs, the volume to 26,600 acre-feet. It also appears that the duration of both of those restored pulses should be limited to 6 days.

Recommended revision to Figure: 30 TAC §298.330(e)(16), for the large seasonal pulse for the spring season, restore the trigger level to 4,900 cfs and the volume to 22,100 acre-feet; and for the annual pulse, restore the trigger level to 4,900 cfs, the volume to 22,100 acre-feet. It also appears that the duration of both of those restored pulses should be limited to 6 days.

Recommended revision to Figure: 30 TAC §298.330(e)(17), for the large seasonal pulse for the spring season, restore the trigger level to 3,100 cfs and the volume to 17,800 acre-feet, with a duration of 8 days; and for the annual pulse, restore the trigger level to 4,500 cfs, the volume to 26,700 acre-feet and the duration to 11 days. In addition, add a one-per-two-year pulse with a trigger level of 5,800 cfs, volume of 35,400 acre-feet, and a duration of 11 days.

Recommended revision to Figure: 30 TAC §298.330(e)(18), for the annual pulse, restore the trigger level to 1,200 cfs, the volume to 6,400 acre-feet and the duration to 11 days and add a one-per-two-year pulse with a trigger level of 1,500 cfs, volume of 8,600 acre-feet, and a duration of 12 days.

Recommended revision to Figure: 30 TAC §298.330(e)(19), for the large seasonal pulse for the spring season, restore the trigger level to 1,500 cfs and the volume to 9,400 acre-feet, with a duration 9 days; and for the annual pulse, restore the trigger level to 2,800 cfs, the volume to 17,800 acre-feet and the duration to 12 days. In addition, add a one-per-two-year pulse with a trigger level of 4,700 cfs, volume of 31,900 acre-feet, and a duration of 14 days and a one-per-five year pulse with a trigger level of 6,700 cfs, a volume of 46,900 acre-feet, and a duration of 16 days.

Recommended revision to Figure: 30 TAC §298.330(e)(20), for the large seasonal pulse for the spring season, restore the trigger level to 1,100 cfs and the volume to 4,400 acre-feet, with a duration of 9 days; and for the annual pulse, restore the trigger level to 2,000 cfs, the volume to 8,900 acre-feet and the duration to 13 days. In addition, add a one-per-two-year pulse with a trigger level of 3,100 cfs, volume of 13,600 acre-feet, and a duration of 14 days and add a one-per-five-year pulse with a trigger level of 3,500 cfs, a volume of 16,304 acre-feet, and a duration of 15 days. [The trigger level for the one-per-five-year pulse is adjusted downward from the BBASC recommendation to avoid potentially protecting a flood level pulse.]

Recommended revision to Figure: 30 TAC §298.330(e)(21), for the annual pulse, restore the trigger level to 2,400 cfs, the volume to 13,800 acre-feet and set the duration for the restored pulse to 7days.

If the commission includes the pulse flow protections set out above, we also support inclusion in the flow standards of the pulse flow implementation approaches described at pages 33-38 of the CL BBASC report.[47]

Section 298.335. Water Right Permit Conditions.

Section 298.335 (a), (b), (c): Although it may often work out that "flow restriction special conditions" would be adequate to ensure compliance with the environmental flow standards, there is no need to constrain the commission's discretion in this manner. It simply is not possible now to predict precisely what types of permit applications the commission may be asked to consider in the future and the commission should retain flexibility to protect the flow standards. For example, consider the case of a proposed permit that, because of flow restriction special conditions, would comply with instream flow requirements but would slightly impair an applicable freshwater inflow requirement. TCEQ should retain the flexibility to include some other type of permit condition, besides a flow restriction, that would be sufficient to address the impairment if using that other type of condition would be the most efficient way to proceed. Nothing in S.B. 3 purports to limit the types of permit conditions to be used in protecting environmental flows. TCEQ should not unduly limit its options in this respect. Accordingly, the commenting parties recommend that Subsections (a), (b), and (c) should be revised to reflect the following refinements:

[47] Colorado and Lavaca Basin and Bay Stakeholder Committee Environmental Flows Recommendation Report, at p. 33-38 (August 2011).

(a) For water right permits with an authorization to store or divert water from the Colorado River above Lake Travis, tributaries of the Colorado River, the Lavaca River Basin, and the Colorado-Lavaca and Lavaca-Guadalupe Coastal Basins, except for water right permits located below Lake Travis on the Colorado River, and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain ~~flow restriction~~ special conditions that are adequate to protect the environmental flow standards of this subchapter.

(b) For water right permits with an authorization to divert at a rate greater than 500 cubic feet per second (cfs) or to store more than 2,500 acre-feet in an on-channel reservoir, on the Colorado River below Lake Travis, and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain ~~flow restriction~~ special conditions that are adequate to protect the environmental flow standards of this subchapter.

(c) For water right permits with an authorization to divert at a rate less than 500 cfs or to store less than 2,500 acre-feet in an on-channel reservoir, on the Colorado River below Lake Travis, and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain ~~flow restriction~~ special conditions that are adequate to protect the environmental flow standards of this subchapter; however, no special conditions are necessary to preserve or pass high flow pulses.

Subchapter E. Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays

Section 298.355. Definitions.
The definition of average condition should reflect that the 50% of time being referred is intended to refer to times that are neither dry nor wet.

(1) Average condition--for all measurement points for which a hydrologic condition is applicable, the hydrologic condition that would occur approximately 50% of the time and that is intended to represent periods that are neither dry nor wet.

The definition of dry condition should reflect that the 25% of time being referenced is intended to represent times that are dry, not just any 25% of time.

(2) Dry condition--for all measurement points for which a hydrologic condition is applicable, the hydrologic condition that would occur approximately 25% of the time and that is intended to represent the driest periods.

Because the term spring is used to refer to a different time period for instream flow standards than for freshwater inflow standards, the applicability of the definition here should be limited to the instream flow measurement points. The months for the spring season as used in the freshwater inflow aspects of the standards are listed separately in Figure 30 TAC §298.380(a)(1) and likely do not need to be defined here.

(6) Spring—for the measurement points listed in Section 298.330(c), the period of time April through June, inclusive.

Because the term summer is used to refer to a different time period for instream flow standards than for freshwater inflow standards, the applicability of the definition here should be limited to the instream flow measurement points. The months for the summer season as used in the freshwater inflow aspects of the standards are listed separately in Figures 30 TAC §298.380(a)(1) and §298.380(a)(3) and likely do not need to be defined here.

(9) Summer—for the measurement points listed in Section 298.330(c), the period of time July through September, inclusive.

The definition of wet condition should reflect that the 25% of time being referenced is intended to represent times that are wet, not just any 25% of time.

(10) Wet condition--for all measurement points for which a hydrologic condition is applicable, the hydrologic condition that would occur approximately 25% of the time and that is intended to represent the wettest periods.

Add definition for "time-period." The term "time-period" is used in describing certain short-duration high flow pulses at four specific measurement points. Those time-periods do not conform to the seasons used in defining other pulses. Because occurrence frequency for those pulses is defined by time-period rather than a particular season, a defined term is needed to help describe how pulse flow compliance for those pulses will be determined.

Time-period—for certain measurement points in the San Antonio River Basin, the period of time specifically listed in the column labeled "time-period" in Figures: 30 TAC §§298.380(c)(12)(B), 298.380(c)(13)(B), 298.380(c)(14)(B), and 298.380(c)(15)(B). Each

time-period listed in those figures is considered independently in assessing high flow pulse requirements even if there are overlapping months.

Section 298.360. Findings.

Section 298.360 (b):
The contention that year-to-year variation in flows as a result of changes in rainfall is an adequate mechanism for protecting a flow regime and a sound ecological environment is unjustified. With the exception of the gauges in the Guadalupe River Basin, the proposed rules do incorporate mechanisms for incorporating seasonal and year-to-year changes based on hydrological condition and multiple levels of base flows. However, the proposed rules do not incorporate multiple levels of base flows for locations in the Guadalupe Basin and, accordingly, do not provide for reasonable levels of year-to-year variations.
A single base flow level , as is proposed for the Guadalupe River locations, is not sufficient to meet the statutory standard of protecting a sound ecological environment to the maximum extent reasonable considering other relevant interests. It does not account for fluctuations in flow levels based on year-to-year changes reflecting wet and dry conditions. There is no reason why a multiple-level base flow component, that does account for such fluctuations, cannot be implemented in the Guadalupe River Basin as well as the other basins. In terms of defining the starting point for the development of an environmental flow standard, Senate Bill 3 directs the development of an environmental flow regime, which "means a schedule of flow quantities that reflects seasonal and yearly fluctuations that typically would vary geographically, by specific location in a watershed, and that are shown to be adequate to support a sound ecological environment and to maintain the productivity, extent, and persistence of key aquatic habitats in and along the affected water bodies." Tex. Water Code § 11.002 (16). Thus, yearly fluctuations are intended to be incorporated in order to protect a sound ecological environment. Accordingly, the following revisions to Section 298.360 (c) are recommended:

(b) For the Guadalupe, San Antonio, Mission, and Aransas Rivers, and their associated tributaries, the commission finds that these sound ecological environments can best be maintained by a set of flow standards that implement a schedule of flow quantities that contain subsistence flow, three levels of base flow, and multiple levels of high flow pulse flows, including overbank flows, at defined measurement points. ~~Minimum~~ Flow levels protected by ~~for~~ these components will vary by season and by year in accordance with hydrologic condition indicators ~~since the amount of precipitation and, therefore, whether a system is in subsistence or base flow conditions, will vary from year to year and within a year from season to season,~~ and the number of pulses protected will also vary with the amount of precipitation.

Section 298.360 (c):
The needed freshwater inflow protections cannot be achieved solely through the freshwater inflow standards because, among other things, those inflow protections only cover two seasons. During the remaining months, inflow protections are dependent on protections provided through instream flow criteria. Best available science indicates that at least the levels of instream flow protections recommended by the GSA BBEST are needed in order to provide adequate inflows during those remaining months to protect a sound ecological environment. The GSA BBASC recommended, as a result of its balancing exercise, some relaxation of those instream flow protections. There certainly is not an adequate basis to support a statement that a sound ecological environment in the bays can be maintained without including instream flow standards at least as protective as those recommended by GSA BBASC and even those recommended by the BBEST. The commission has not provided adequate support for this contention. In addition, this provision should acknowledge the importance of targets for implementation of strategies to increase inflows above levels expected with full exercise of existing water rights. Accordingly, the following revisions to Section 298.360 (c) are recommended:

(c) For Mission, Copano, Aransas, and San Antonio Bays, the commission finds that the sound ecological environment of these bays can best be maintained by a set of freshwater inflow standards that include freshwater inflow quantities that vary by season and from year to year <u>for certain selected seasons and that rely on quantities of flow protected by instream flow standards consisting of subsistence flows, three levels of base flows, and multiple levels of high flow pulse flows during the remaining seasons. The commission also finds that the freshwater inflow standards should incorporate targets for implementing strategies to increase inflow regime level achievement above the frequencies expected with full exercise of existing water rights.</u>

Section 298.370. Calculation of Hydrologic Conditions.
As discussed elsewhere in these comments, the proposed reduction in protections for instream flows in the Guadalupe River Basin, in particular below the levels recommended by the GSA BBASC, is not justified as being adequate to protect a sound ecological environment or as being necessary to prevent unreasonable adverse impacts to other public interests. The levels of protection recommended by the BBASC should be incorporated, including application of hydrologic condition indicators to govern application of the three-tiers of base flows in that basin. We also support, consistent with the recommendation of the GSA BBASC, creating a mechanism to have a preliminary assessment of hydrologic condition(s) throughout the river basin posted for the upcoming

season (5) days in advance of the first day of the season to allow for operational planning and adjustments.

Accordingly, the commenting parties recommend that Subsections (a)-(c) be revised to read as follows:

(a) For new water right authorizations in the Guadalupe River Basin, San Antonio River Basin, and the San Antonio-Nueces Coastal Basin which increase the amount of water authorized to be stored, taken, or diverted as described in §298.10 of this title (relating to Applicability), the determination of the hydrologic condition for a particular season shall be determined once per season. The conditions present on the last day of the month of the preceding season will determine the hydrologic condition for the following season for the applicable measurement point. For each measurement point specified in the applicable river or coastal basin, cumulative streamflow for the previous 12 months will determine the hydrologic condition.

(b) For purposes of permit special conditions related to hydrologic conditions, for water right applications in the Guadalupe River Basin, San Antonio River Basin, and the San Antonio-Nueces Coastal Basin, which increase the amount of water to be stored, taken, or diverted, the hydrologic condition shall be calculated using the full period of record for the United States Geological Survey (USGS) gage at each measurement point such that dry conditions occur approximately 25% of the time, average conditions occur approximately 50% of the time, and wet conditions occur approximately 25% of the time.

(c) For purposes of water availability determinations, for water right permit applications in the Guadalupe River Basin, San Antonio River Basin, and the San Antonio-Nueces Coastal Basin, which increase the amount of water to be stored, taken, or diverted, hydrologic conditions used in the commission's water availability models shall be calculated such that dry conditions occur approximately 25% of the time, average conditions occur approximately 50% of the time, and wet conditions occur approximately 25% of the time, based on the period of record and simulated flows of the applicable water availability model.

Section 298.375. Schedule of Flow Quantities.

Section 298.375 (b):
As discussed elsewhere in these comments, the proposed reduction in protections for instream flows in the Guadalupe River Basin, in particular below the levels recommended by the GSA BBASC, is not justified as being adequate to protect a sound ecological

environment or as being necessary to prevent unreasonable adverse impacts to other public interests. The levels of protection recommended by the BBASC should be incorporated, including application of multiple levels of base flows for the Guadalupe Basin, with the limited exception of a single level of base flows in two seasons at the three lowermost gages. The recommended language, set out below, tracking what the GSA BBASC intended regarding application of the 50% rule for those three guages and the two seasons with a single level of base flows should be included in the rules only if the full BBASC instream flow regime, including the 10% dedication requirement, is implemented. The BBASC intended this as part of a complete package of flow protections and not a stand-alone weakening of flow protections. At those locations and during those seasons, the BBASC intended the 50% rule to apply between the single level of base flow and the subsistence level without regard to hydrologic condition but only as part of a total package that provided offsetting protections. The effect of applying the 50% rule in this way is to allow additional diversions during those two seasons than could otherwise occur with three levels of base flows.

Accordingly, subject to the qualification above about use of the 50% rule for single-season base flows, the commenting parties recommend that Subsection (b) be revised to include the following changes:

(b) Subsistence flow. The applicable subsistence flow standard varies depending on the seasons as described in §298.355 of this title (relating to Definitions). For a water right holder to which an environmental flow standard applies, at a measurement point that applies to the water right, the water right holder may not store or divert water, unless the flow at the measurement point is above the applicable subsistence flow standard for that point. For measurement points in the Guadalupe River Basin <u>described in Sections 298.380(c)(6), (8), and (9) during seasons that have only one defined level of base flow</u>, if the flow at the applicable measurement point is above the subsistence flow standard but below the base flow standard, then the water right holder must allow the applicable subsistence flow, plus 50% of the difference between measured streamflow and the applicable subsistence flow, to pass its measurement point and any remaining flow may be diverted or stored, according to its permit, subject to senior and superior water rights, as long as the flow at the measurement point does not fall below the applicable subsistence flow standard. For <u>all measurement points in the Guadalupe Basin during seasons that have more than one defined level of base flow and for all</u> measurement points in the San Antonio River Basin and the San Antonio-Nueces Coastal Basin, during dry hydrologic conditions, if the flow at the applicable measurement point is above the subsistence flow standard but below the applicable dry base flow standard, then the water right holder must allow the applicable subsistence flow, plus 50% of the difference between measured streamflow and

the applicable subsistence flow, to pass its measurement points and any remaining flow may be diverted or stored, according to its permit, subject to senior and superior water rights, as long as the flow at the measurement point does not fall below the applicable subsistence flow standard.

Section 298.375 (c):
As discussed elsewhere in these comments, the proposed reduction in protections for instream flows in the Guadalupe River Basin, in particular below the levels recommended by the GSA BBASC, is not justified as being adequate to protect a sound ecological environment or as being necessary to prevent unreasonable adverse impacts to other public interests. The levels of protection recommended by the BBASC should be incorporated, including application of multiple levels of base flows for the Guadalupe Basin. The recommended language, set out here, tracking what the GSA BBASC intended regarding application of the 50% rule and hydrologic condition as part of a complete package of flow protections should be included in the rules only if the full BBASC instream flow regime, including the 10% dedication requirement, is implemented. The BBASC intended the 50% rule to apply between the single level of base flow and the subsistence level without regard to hydrologic condition but only as part of a total package that provided offsetting protections. The effect of applying the 50% rule and hydrologic condition in this way is to allow additional diversions during those two seasons than could otherwise occur with three levels of base flows.
Accordingly, subject to the qualification above about use of the 50% rule and hydrologic condition for single-season base flows, the commenting parties recommend that Subsection (c) be revised to include the following changes:

(c) Base flow. The applicable base flow level varies depending on the seasons as described in §298.355 of this title, and the hydrologic condition described in §298.370 of this title (relating to Calculation of Hydrologic Conditions) for river and coastal basins to which a hydrologic condition applies. For a water right holder in the Guadalupe River Basin, San Antonio River Basin, or the San Antonio-Nueces Coastal Basin, to which an environmental flow standard applies, at a measurement point that applies to the water right, the water right holder is subject to the base flow standard for the hydrologic condition prevailing at that time, i.e., the water right holder will be subject to one of the following: a dry, an average, or a wet base flow standard. Notwithstanding the previous sentence, f~~F~~or a water right holder in the Guadalupe River Basin, to which an environmental flow standard applies, at a measurement point described in Sections 298.380(c)(6), (8), or (9) that applies to the water right, during those seasons that have only one defined level of base flow the water right holder is subject to the defined ~~a~~ base flow standard and hydrologic condition does not apply. For a water right holder to which an environmental flow

standard applies, at a measurement point that applies to the water right, when the flow at the applicable measurement point is above the applicable base flow standard, but below any applicable high flow pulse trigger levels, the water right holder may store or divert water according to its permit, subject to senior and superior water rights, as long as the flow at the applicable measurement point does not fall below the applicable base flow standard.

Section 298.375 (d):
As discussed elsewhere in these comments, the proposed reduction in protections for instream flows in the Guadalupe River Basin, in particular below the levels recommended by the GSA BBASC, is not justified as being adequate to protect a sound ecological environment or as being necessary to prevent unreasonable adverse impacts to other public interests. The exclusion of pulse flows with durations of greater than 30 days has not been justified. For smaller pulses, up through the one-per-year pulse, we have recommended limiting the duration to 30 days as a step towards simplification. However, those pulses do need to be protected. In addition, larger pulse flows are needed to support a sound ecological environment and should be protected, even with a duration of longer than 30 days. In addition to playing key functions in riverine ecosystems, protection of large pulse flows is essential for protecting freshwater inflows to estuaries, especially during the two seasons for which no specific freshwater inflow standards are proposed. The levels of protection recommended by the BBASC should be incorporated, including application of multiple levels of pulse flows for the Guadalupe Basin and protection of the full suite of pulse flows recommended by the GSA BBASC. For purposes of high flow pulse engagement, the reference to flows being above the applicable base flow standard is inapposite. Pulse flow requirements are not dependent on hydrological condition and are applicable whenever the trigger level flow has been satisfied. By definition, those trigger levels are higher than the base flow levels. Additional description is needed about when pulse flow diversion restrictions apply and end. That is particularly important for the short-duration (two day) pulses at certain locations in the San Antonio River basin because satisfaction of pulse flow requirements is measured in a more rigorous manner. Accordingly, the commenting parties recommend that Subsection (d) be revised to include the following changes:

(d) High flow pulses. High flow pulses are relatively short-duration, high flows within the watercourse that occur during or immediately following a storm event.

(1) For measurement points in the Guadalupe River Basin, the San Antonio-Nueces Coastal Basin, and all measurement points in the San Antonio River Basin other than those <u>described in §298.380(c)(12) - (15) of this title, a combination of two-per-season and one-per-season, one-per-year, one-per-two-year, and one-per-five-year high flow pulses</u> ~~two~~

~~pulses per season~~ are to be passed (i.e., no storage or diversion by an applicable water right holder), if applicable, and as described in §298.380 of this title, ~~if the flows are above the applicable base flow standard, and~~ if the applicable high flow pulse trigger level is met at the applicable measurement point. Once the applicable high flow pulse trigger level is met, t~~T~~he water right holder shall not divert or store water except during times that streamflow at the applicable measurement point exceeds the applicable high flow pulse trigger level or ~~and~~ until either the applicable volume amount has passed the measurement point or the applicable duration time has passed since the high flow pulse trigger level occurred.

(2) For measurement points described in §298.380(c)(12) - (15) of this title in the San Antonio River Basin~~and the San Antonio-Nueces Coastal Basin~~, a combination of one small seasonal high flow pulse per season and one, two, or three short-duration high flow pulses per specified time period ~~season~~ are to be passed (i.e., no storage or diversion by an applicable water right holder), if applicable, and as described in §298.380 of this title, in accordance with the following procedures: ~~if the flows are above the applicable base flow standard, and if the applicable high flow pulse trigger level is met at the applicable measurement point.~~

(A) for the small seasonal pulse, ~~if the flows are above the applicable base flow standard, and~~ if the applicable pulse trigger level is met at the applicable measurement point, the water right holder shall not divert or store water except during times that streamflow at the applicable measurement point exceeds the applicable pulse trigger level or until either the applicable volume amount has passed the measurement point or the applicable duration time has passed since the pulse trigger level occurred; and

(B) for the short-duration pulses, once the applicable ~~large~~ short-duration high flow pulse trigger level is met, the water right holder shall not divert or store water except at times that the remaining flow exceeds the applicable short-duration ~~large~~ pulse trigger level until the daily average flow at the applicable measurement point either:

(i) stays at or above ~~equals at least~~ that ~~e large high flow pulse~~ trigger level on consecutive days equaling the applicable duration time, or

(ii) falls below that ~~e high flow pulse~~ trigger level prior to equaling the applicable duration time on consecutive days, in which case the pulse is not counted as having satisfied a pulse flow requirement~~except during times that streamflow at the applicable measurement point exceeds the applicable high flow pulse trigger level~~.

~~(3) For all measurement points in the San Antonio River Basin, other than those described in §298.380(c)(12) - (15) of this title, and for measurement points in the San Antonio-Nueces Coastal Basin, a combination of two-per-season and one-per-season, one-per-year, one-per-two-year, and one-per-five-year high flow pulses are to be passed (i.e., no storage~~

~~or diversion by an applicable water right holder), if applicable, and as described in §298.380 of this title. and for small seasonal pulses at the measurement points described in §298.380(c)(12) - (15) of this title The water right holder shall not divert or store water except during times that streamflow at the applicable measurement point exceeds the applicable high flow pulse trigger level and until either the applicable volume amount has passed the measurement point or the~~ applicable ~~duration time has passed since the high flow pulse trigger level occurred.~~

(3) If the applicable high flow pulse flow trigger level does not occur in a season, then the water right holder need not stop storing or diverting to produce a high flow pulse. The water right holder is not required to release water lawfully stored to produce a high flow pulse.

(4) Each season is independent of the preceding and subsequent seasons with respect to high flow pulse frequency and each time-period is independent of each other time-period with respect to high flow pulse frequency regardless of overlapping months, except as otherwise provided in Subsection (7) of this Section.

(5) High flow pulses are independent of the hydrologic conditions set out in §298.370 of this title~~, for measurement points for which a hydrologic condition is applicable. For all measurement points, high flow pulses~~ and are applicable under ~~both~~ subsistence and all base flow conditions.

(6) For all measurement points ~~in the San Antonio River Basin and the San Antonio-Nueces Coastal Basin,~~ except those described in §298.380(c)(12) - (15) of this title, if a high flow pulse meeting the one-per-season ~~large~~ pulse requirement occurs in a particular season, one of the ~~smaller~~ two-per-season pulse requirements for that season is also considered to be satisfied. ~~When a pulse flow requirement for an annual pulse is satisfied in a particular season, the one-per-season pulse requirement and one of the two-per-season pulse requirements are also considered to be satisfied.~~ When a high flow pulse meeting the one-per-year, one-per-two-year, or one-per-five-year pulse requirement occurs during a particular season, the one-per-season and one of the two-per-season pulse requirements are also considered to be satisfied for that season. Similarly, when a high flow pulse meeting the one-per-five-year pulse requirement occurs during a particular year, the requirement for a one-per-year pulse and a one-per-two-year pulse during that year is also considered to be satisfied. When a high flow pulse meeting the requirement for a one-per-two-year pulse occurs, it also satisfies the requirement for a one-per-year pulse in that same year.

(7) For the measurement points described in §298.380(c)(12) - (15) of this title, when a high flow pulse meeting the short-duration pulse requirement occurs during a month, that high flow pulse also satisfies the requirement for the small seasonal pulse for the season that includes the month and for one short-duration pulse that has an equal or smaller trigger level for any other time-period that also includes that month.

Section 298.380. Environmental Flow Standards.

Section 298.380 (a):
As discussed elsewhere in these comments, TCEQ has not justified allowing a 10% impairment of modeling permitting frequency for inflow regimes. The inflow regimes included in the proposed rules incorporate, for the drier period regimes, much lower protections, even without the 10% relaxation, than those indicated by the GSA BBEST as being adequate to support a sound ecological environment. The GSA BBASC undertook a balancing exercise and determined the reasonable water supply development could occur with the inflow regimes recommended by the BBASC. Additional weakening of those protections below the levels recommended by the BBASC are not justified. Accordingly, the commenting parties recommend that Subsection (a) be revised to delete the indicated language:

(a) A water right application in the Guadalupe and San Antonio River Basins and the San Antonio-Nueces Coastal Basin, which increases the amount of water authorized to be stored, taken, or diverted as described in §298.10 of this title (relating to Applicability), shall not cause or contribute to an impairment of the inflow regimes as described in the figures in this subsection. Impairment of the inflow regime shall be evaluated as part of the water availability determination for a new water right or amendment that is subject to this subchapter. For purposes of this subsection, impairment would occur if the application, when considered in combination with any authorizations subject to this subchapter, which were issued prior to this application, would impair the modeled permitting frequency of any inflow regime~~by more than 10%~~.

Figures 298.380(a)(1) and (a)(2):
The assessment approaches to be used for the specific inflow regimes are not stated in the current figures or elsewhere in the proposed rules. Some explanation is required for how the assessment will be undertaken and for whether an increase in value is to be avoided or a decrease in value. For example, as explained in the BBASC Report for some inflow regimes, the value to be assessed is the ratio of years with certain inflow levels, which is a subset of the total category, to the total number of years in the category. Accordingly, the commenting parties recommend that Figures 298.380(a)(1) and (a)(2) be revised to include the indicated language:

Figure 30 TAC §298.380(a)(1)

Bay and Estuary Freshwater Inflow Standards for the San Antonio Bay System for the Spring Season			
Inflow Regime	**Inflow Quantity (February) (af)**	**Inflow Quantity (March-May) (af)**	**Strategy Target Frequency**
Spring 1, assessed as percentage of total years*	N/A	550,000-925,000	at least 12% of the years
Spring 2, assessed as percentage of total years*	N/A	375,000-550,000	at least 12% of the years
Spring 3	N/A	275,000-375,000	N/A
Spring 4	greater than 75,000	150,000-275,000	N/A
Spring 5	less than 75,000	150,000-275,000	N/A
Spring 6, assessed as percentage of total years**	N/A	0-150,000	no more than 9% of the years
Spring 2 and Spring 3 combined, assessed as percentage of total years*	N/A	N/A	at least 17% of the years
Spring 4 and Spring 5 combined, assessed as ratio of Spring 5 years to total combined years**	N/A	N/A	less than 67% of the total

af=acre-feet
*avoid decrease in value
**avoid increase in value

Figure: 30 TAC §298.380(a)(2)

Bay and Estuary Freshwater Inflow Standards for the San Antonio Bay System for the Summer Season			
Inflow Regime	**Inflow Quantity (June) (af)**	**Inflow Quantity (July-September) (af)**	**Strategy Target Frequency**
Summer 1, assessed as percentage of total years*	N/A	450,000-800,000	at least 12% of the years
Summer 2, assessed as percentage of total years*	N/A	275,000-450,000	at least 17% of the years
Summer 3	N/A	170,000-275,000	N/A
Summer 4	greater than 40,000	75,000-170,000	N/A
Summer 5	less than 40,000	75,000-170,000	N/A
Summer 6	N/A	50,000-75,000	N/A
Summer 7, assessed as percentage of total years**	N/A	0-50,000	no more than 6% of the years
Summer 2 and Summer 3 combined, assessed as percentage of total years*	N/A	N/A	at least 30% of the years
Summer 4 and Summer 5 combined, assessed as ratio of Summer 5 years to total combined years**	N/A	N/A	Summer 5 no more than 17% of the total
Summer 6 and Summer 7 combined, assessed as percentage of total years**	N/A	N/A	no more than 9% of the years

af=acre feet

*avoid decrease in value
**avoid increase in value

Section 298.380 (b):
Generally, the language of proposed Section 298.380 (b) closely matches the GSA BBASC recommendations. However, one aspect of that language is problematic. As drafted, the language could be read as indicating that improvements in inflows as a result of the implementation of strategies would only be protected if those improvements actually fully meet the freshwater inflow standards rather than if they merely incrementally help to get closer to meeting those standards. The commenting parties hope that TCEQ's intent is to protect incremental improvements along the path to meeting the standard because proceeding in incremental steps will be essential. That certainly is what we understand that the GSA BBASC intended. Accordingly, the commenting parties recommend that Subsection (b) be revised to read as follows:

(b) To the extent that strategies are implemented through a water rights permit or amendment to help meet the freshwater inflow standards for San Antonio, Mission, Aransas, and Copano Bays, a water right application in the Guadalupe and San Antonio River Basins and the San Antonio-Nueces Coastal Basin, which increases the amount of water authorized to be stored, taken or diverted as described in §298.10 of this title, shall not reduce the modeled permitting frequency for any inflow regime level, listed in Figure: 30 TAC §298.380(a)(1), Figure: 30 TAC §298.380(a)(2), and Figure: 30 TAC §298.380(a)(3), below the level that would occur with the permitted strategy or strategies in place.

Figures 298.380(c)(1)-(c)(9):
As discussed above, the low levels of flow protection at these locations in the proposed rules are not justified as being adequate to support a sound ecological environment or as being needed to avoid an unreasonable adverse impact on other public interests. Accordingly, the Figures should be revised to include the components shown in the tables reproduced below. As an additional basis for the recommended revisions, we note that the proposed rules appear to have substituted the pulse size of the summer one-per-season pulse for the summer two-per-season pulse at three locations: Guadalupe River at Gonzales, Guadalupe River at Cuero, and Guadalupe River at Victoria. The larger pulse is still called for in the proposed rules with a frequency of twice per season. Although we are guessing that the substitution may have been intended to provide for an increased level of protection, it is far from clear that it would accomplish that goal. It actually is quite unlikely that the larger pulse would occur twice in any season. Historical statistics indicate that it would not. As a result, the intended protection likely would prove to be illusory because the smaller-sized pulses, which would be expected to occur twice per season, would not be

protected and could be diverted. By contrast, the second of the larger-sized pulses which is "protected" under the proposed rule is unlikely to occur and so would not actually deliver any environmental benefit. For purposes of simplification, durations of 1-per-year pulses and seasonal pulses have been limited to no more than 30 days, durations of 1-per-2-year pulses have been limited to no more than 60 days, and durations of 1-per-5-year pulses have been limited to no more than 90 days.

Figure: 30 TAC §298.380(c)(1)
United States Geological Survey Gage 08167000, Guadalupe River at Comfort

Season	Hydrologic Condition	Subsist-ence	Base	2 per Season Pulse	1 per Season Pulse	1-per-year-pulse	1-per-2-year-pulse	1-per-5-year-pulse
Winter	Dry	31 cfs	54 cfs	Trigger: 140 cfs Volume: 1,030 af Duration: 11 days	Trigger: 350 cfs Volume: 3,390 af Duration: 20 days	Trigger: 4,020 cfs Volume: 37,400 af Duration: 30 days	Trigger: 7,420 cfs Volume: 72,400 af Duration: 60 days	Trigger: 15,900 cfs Volume: 100,000 af Duration: 90 days
Winter	Average	N/A	77 cfs					
Winter	Wet	N/A	110 cfs					
Spring	Dry	18 cfs	35 cfs	Trigger: 400 cfs Volume: 2,980 af Duration: 17 days	Trigger: 1,190 cfs Volume: 8,950 af Duration: 26 days			
Spring	Average	N/A	69 cfs					
Spring	Wet	N/A	100 cfs					
Summer	Dry	2 cfs	25 cfs	Trigger: 160 cfs Volume: 1,130 af Duration: 12 days	Trigger: 570 cfs Volume: 4,110 af Duration: 19 days			
Summer	Average	N/A	50 cfs					
Summer	Wet	N/A	75 cfs					
Fall	Dry	25 cfs	48 cfs	Trigger: 160 cfs Volume: 1,110 af Duration: 13 days	Trigger: 500 cfs Volume: 4,060 af Duration: 24 days			
Fall	Average	N/A	77 cfs					
Fall	Wet	N/A	110 cfs					

cfs = cubic feet per second
af = acre-feet
N/A = not applicable

Figure: 30 TAC §298.380(c)(2)
United States Geological Survey Gage 08167500, Guadalupe River near Spring Branch

Season	Hydrologic Condition	Subsist-ence	Base	2 per Season Pulse	1 per Season Pulse	1-per-year-pulse	1-per-2-year-pulse	1-per-5-year-pulse
Winter	Dry	18 cfs	70 cfs	Trigger: 210 cfs Volume: 1,520 af Duration: 11 days	Trigger: 570 cfs Volume: 5,150 af Duration: 19 days	Trigger: 5,720 cfs Volume: 51,900 af Duration: 30 days	Trigger: 11,300 cfs Volume: 109,000 af Duration: 60 days	Trigger: 23,700 cfs Volume: 242,000 af Duration: 82 days
Winter	Average	N/A	100 cfs					
Winter	Wet	N/A	160 cfs					
Spring	Dry	18 cfs	44 cfs	Trigger: 870 cfs Volume: 6,500 af Duration: 19 days	Trigger: 2,310 cfs Volume: 17,500 af Duration: 26 days			
Spring	Average	N/A	91 cfs					
Spring	Wet	N/A	160 cfs					
Summer	Dry	18 cfs	36 cfs	Trigger: 240 cfs Volume: 1,520 af Duration: 11 days	Trigger: 870 cfs Volume: 5,970 af Duration: 19 days			
Summer	Average	N/A	64 cfs					
Summer	Wet	N/A	110 cfs					
Fall	Dry	18 cfs	57 cfs	Trigger: 230 cfs Volume: 1,660 af Duration: 12 days	Trigger: 1,000 cfs Volume: 8,060 af Duration: 23 days			
Fall	Average	N/A	100 cfs					
Fall	Wet	N/A	150 cfs					

cfs = cubic feet per second
af = acre-feet
N/A = not applicable

Figure: 30 TAC §298.380(c)(3)
United States Geological Survey Gage 08171000, Blanco River at Wimberley, Texas

Season	Hydrologic Condition	Subsist-ence	Base	2 per Season Pulse	1 per Season Pulse	1-per-year-pulse	1-per-2-year-pulse	1-per-5-year-pulse
Winter	Dry	10 cfs	20 cfs	Trigger: 54 cfs Volume: 360 af Duration: 10 days	Trigger: 380 cfs Volume: 3,840 af Duration: 28 days	Trigger: 2,820 cfs Volume: 24,900 af Duration: 30 days	Trigger: 4,640 cfs Volume: 43,100 af Duration: 58 days	Trigger: 8,310 cfs Volume: 82,000 af Duration: 74 days
Winter	Average	N/A	34 cfs					
Winter	Wet	N/A	52 cfs					
Spring	Dry	13 cfs	18 cfs	Trigger: 360 cfs Volume: 2,370 af Duration: 18 days	Trigger: 960 cfs Volume: 6,540 af Duration: 26 days			
Spring	Average	N/A	40 cfs					
Spring	Wet	N/A	64 cfs					
Summer	Dry	8 cfs	18 cfs	Trigger: 74 cfs Volume: 410 af Duration: 9 days	Trigger: 190 cfs Volume: 1,130 af Duration: 13 days			
Summer	Average	N/A	36 cfs					
Summer	Wet	N/A	56 cfs					
Fall	Dry	10 cfs	18 cfs	Trigger: 82 cfs Volume: 500 af Duration: 10 days	Trigger: 440 cfs Volume: 3,220 af Duration: 21 days			
Fall	Average	N/A	36 cfs					
Fall	Wet	N/A	54 cfs					

cfs = cubic feet per second
af = acre-feet
N/A = not applicable

Figure: 30 TAC §298.380(c)(4)
United States Geological Survey Gage 08172000, San Marcos River at Luling, Texas

Season	Hydrologic Condition	Subsist-ence	Base	2 per Season Pulse	1 per Season Pulse	1-per-year-pulse	1-per-2-year-pulse	1-per-5-year-pulse
Winter	Dry	89 cfs	120 cfs	Trigger: 340 cfs Volume: 1,800 af Duration: 8 days	Trigger: 1,330 cfs Volume: 11,400 af Duration: 23 days	Trigger: 6,120 cfs Volume: 56,400 af Duration: 30 days	Trigger: 10,600 cfs Volume: 110,000 af Duration: 57 days	Trigger: 17,900 cfs Volume: 208,000 af Duration: 78 days
Winter	Average	N/A	160 cfs					
Winter	Wet	N/A	210 cfs					
Spring	Dry	89 cfs	110 cfs	Trigger: 1,140 cfs Volume: 6,800 af Duration: 14 days	Trigger: 2,740 cfs Volume: 18,400 af Duration: 21 days			
Spring	Average	N/A	160 cfs					
Spring	Wet	N/A	220 cfs					
Summer	Dry	73 cfs	110 cfs	Trigger: 240 cfs Volume: 1,090 af Duration: 6 days	Trigger: 500 cfs Volume: 2,670 af Duration: 9 days			
Summer	Average	N/A	170 cfs					
Summer	Wet	N/A	220 cfs					
Fall	Dry	81 cfs	120 cfs	Trigger: 540 cfs Volume: 2,740 af Duration: 9 days	Trigger: 1,710 cfs Volume: 11,200 af Duration: 18 days			
Fall	Average	N/A	170 cfs					
Fall	Wet	N/A	200 cfs					

cfs = cubic feet per second
af = acre-feet
N/A = not applicable

Figure: 30 TAC §298.380(c)(5)
United States Geological Survey Gage 08173000, Plum Creek near Luling, Texas

Season	Hydrologic Condition	Subsist-ence	Base	2 per Season Pulse	1 per Season Pulse	1-per-year-pulse	1-per-2-year-pulse	1-per-5-year-pulse
Winter	Dry	3 cfs	5 cfs	Trigger: 350 cfs Volume: 1,800 af Duration: 17 days	Trigger: 1,470 cfs Volume: 6,870 af Duration: 23 days	Trigger: 4,550 cfs Volume: 19,000 af Duration: 26 days	Trigger: 7,280 cfs Volume: 29,700 af Duration: 29 days	Trigger: 10,800 cfs Volume: 43,100 af Duration: 32 days
Winter	Average	N/A	8 cfs					
Winter	Wet	N/A	12 cfs					
Spring	Dry	2 cfs	3 cfs	Trigger: 720 cfs Volume: 3,300 af Duration: 17 days	Trigger: 2,100 cfs Volume: 8,860 af Duration: 21 days			
Spring	Average	N/A	6 cfs					
Spring	Wet	N/A	10 cfs					
Summer	Dry	1 cfs	2 cfs	Trigger: 48 cfs Volume: 230 af Duration: 10 days	Trigger: 230 cfs Volume: 1,080 af Duration: 15 days			
Summer	Average	N/A	3 cfs					
Summer	Wet	N/A	5 cfs					
Fall	Dry	1 cfs	3 cfs	Trigger: 150 cfs Volume: 720 af Duration: 13 days	Trigger: 750 cfs Volume: 3,280 af Duration: 17 days			
Fall	Average	N/A	5 cfs					
Fall	Wet	N/A	8 cfs					

cfs = cubic feet per second
af = acre-feet
N/A = not applicable

Figure: 30 TAC §298.380(c)(6)
United States Geological Survey Gage 08173900, Guadalupe River at Gonzales, Texas

Season	Hydrologic Condition	Subsist-ence	Base	2 per Season Pulse	1 per Season Pulse	1-per-year-pulse	1-per-2-year-pulse	1-per-5-year-pulse
Winter	Dry	210 cfs	N/A	Trigger: 1,150 cfs Volume: 9,640 af Duration: 13 days	Trigger: 4,140 cfs Volume: 48,300 af Duration: 29 days	Trigger: 14,300 cfs Volume: 165,000 af Duration: 30 days	Trigger: 24,400 cfs Volume: 306,000 af Duration: 57 days	Trigger: 36,700 cfs Volume: 492,000 af Duration: 70 days
Winter	Average	N/A	N/A					
Winter	Wet	N/A	796 cfs					
Spring	Dry	210 cfs	400 cfs	Trigger: 3,250 cfs Volume: 26,900 af Duration: 17 days	Trigger: 6,590 cfs Volume: 58,400 af Duration: 24 days			
Spring	Average	N/A	591 cfs					
Spring	Wet	N/A	791 cfs					
Summer	Dry	210 cfs	400 cfs	Trigger: 950 cfs Volume: 7,060 af Duration: 10 days	Trigger: 1,760 cfs Volume: 14,800 af Duration: 14 days			
Summer	Average	N/A	591 cfs					
Summer	Wet	N/A	727 cfs					
Fall	Dry	180 cfs	N/A	Trigger: 1,410 cfs Volume: 11,400 af Duration: 13 days	Trigger: 4,330 cfs Volume: 41,200 af Duration: 23 days			
Fall	Average	N/A	N/A					
Fall	Wet	N/A	746 cfs					

cfs = cubic feet per second
af = acre-feet
N/A = not applicable

Figure: 30 TAC §298.380(c)(7)
United States Geological Survey Gage 08175000, Sandies Creek near Westhoff, Texas

Season	Hydrologic Condition	Subsist-ence	Base	2 per Season Pulse	1 per Season Pulse	1-per-year-pulse	1-per-2-year-pulse	1-per-5-year-pulse
Winter	Dry	4 cfs	6 cfs	Trigger: 300 cfs Volume: 1,880 af Duration: 16 days	Trigger: 770 cfs Volume: 4,840 af Duration: 21 days	Trigger: 4,020 cfs Volume: 24,500 af Duration: 29 days	Trigger: 6,240 cfs Volume: 38,000 af Duration: 32 days	Trigger: 14,300 cfs Volume: 86,700 af Duration: 39 days
Winter	Average	N/A	10 cfs					
Winter	Wet	N/A	12 cfs					
Spring	Dry	1 cfs	3 cfs	Trigger: 440 cfs Volume: 2,710 af Duration: 18 days	Trigger: 1,670 cfs Volume: 10,100 af Duration: 24 days			
Spring	Average	N/A	6 cfs					
Spring	Wet	N/A	9 cfs					
Summer	Dry	1 cfs	2 cfs	Trigger: 59 cfs Volume: 330 af Duration: 11 days	Trigger: 250 cfs Volume: 1,430 af Duration: 16 days			
Summer	Average	N/A	3 cfs					
Summer	Wet	N/A	4 cfs					
Fall	Dry	2 cfs	3 cfs	Trigger: 150 cfs Volume: 960 af Duration: 14 days	Trigger: 570 cfs Volume: 3,650 af Duration: 18 days			
Fall	Average	N/A	6 cfs					
Fall	Wet	N/A	9 cfs					

cfs = cubic feet per second
af = acre-feet
N/A = not applicable

Figure: 30 TAC §298.380(c)(8)
United States Geological Survey Gage 08175800, Guadalupe River at Cuero

Season	Hydrologic Condition	Subsist-ence	Base	2 per Season Pulse	1 per Season Pulse	1-per-year-pulse	1-per-2-year-pulse	1-per-5-year-pulse
Winter	Dry	130 cfs	N/A	Trigger: 1,610 cfs Volume: 14,100 af Duration: 13 days	Trigger: 4,610 cfs Volume: 55,300 af Duration: 26 days	Trigger: 16,600 cfs Volume: 247,000 af Duration: 30 days	Trigger: 24,700 cfs Volume: 406,000 af Duration: 60 days	Trigger: 45,400 cfs Volume: 869,000 af Duration: 90 days
Winter	Average	N/A	N/A					
Winter	Wet	N/A	980 cfs					
Spring	Dry	120 cfs	410 cfs	Trigger: 3,370 cfs Volume: 31,800 af Duration: 18 days	Trigger: 8,870 cfs Volume: 110,000 af Duration: 30 days			
Spring	Average	N/A	680 cfs					
Spring	Wet	N/A	940 cfs					
Summer	Dry	130 cfs	390 cfs	Trigger: 1,050 cfs Volume: 8,300 af Duration: 12 days	Trigger: 2,110 cfs Volume: 19,300 af Duration: 17 days			
Summer	Average	N/A	600 cfs					
Summer	Wet	N/A	800 cfs					
Fall	Dry	86 cfs	N/A	Trigger: 1,730 cfs Volume: 14,100 af Duration: 13 days	Trigger: 5,200 cfs Volume: 54,700 af Duration: 23 days			
Fall	Average	N/A	N/A					
Fall	Wet	N/A	870 cfs					

cfs = cubic feet per second
af = acre-feet
N/A = not applicable

Figure: 30 TAC §298.380(c)(9)
United States Geological Survey Gage 08176500, Guadalupe River at Victoria, Texas

Season	Hydrologic Condition	Subsist-ence	Base	2 per Season Pulse	1 per Season Pulse	1-per-year-pulse	1-per-2-year-pulse	1-per-5-year-pulse
Winter	Dry	160 cfs	N/A	Trigger: 1,690 cfs Volume: 14,400 af Duration: 13 days	Trigger: 4,620 cfs Volume: 56,100 af Duration: 26 days	Trigger: 16,700 cfs Volume: 257,000 af Duration: 30 days	Trigger: 25,500 cfs Volume: 438,000 af Duration: 60 days	Trigger: 48,000 cfs Volume: 971,000 af Duration: 90 days
Winter	Average	N/A	N/A					
Winter	Wet	N/A	975 cfs					
Spring	Dry	130 cfs	400 cfs	Trigger: 3,300 cfs Volume: 33,000 af Duration: 18 days	Trigger: 9,020 cfs Volume: 119,000 af Duration: 30 days			
Spring	Average	N/A	648 cfs					
Spring	Wet	N/A	945 cfs					
Summer	Dry	150 cfs	370 cfs	Trigger: 1,040 cfs Volume: 8,570 af Duration: 11 days	Trigger: 2,060 cfs Volume: 19,200 af Duration: 16 days			
Summer	Average	N/A	568 cfs					
Summer	Wet	N/A	795 cfs					
Fall	Dry	110 cfs	N/A	Trigger: 1,880 cfs Volume: 15,600 af Duration: 13 days	Trigger: 5,370 cfs Volume: 57,800 af Duration: 23 days			
Fall	Average	N/A	N/A					
Fall	Wet	N/A	865 cfs					

cfs = cubic feet per second
af = acre-feet
N/A = not applicable

Figures 298.380(c)(10)-(c)(16):
As discussed above, the low levels of pulse flow protection at these locations in the proposed rules are not justified as being adequate to support a sound ecological environment or as being needed to avoid an unreasonable adverse impact on other public interests. Accordingly, the referenced figures should be revised to include the components listed below. For purposes of simplification, durations of 1-per-year pulses and seasonal pulses have been limited to no more than 30 days, durations of 1-per-2-year pulses have been limited to no more than 60 days, and durations of 1-per-5-year pulses have been limited to no more than 90 days.

Medina, San Antonio, Mission:
Medina River @ Bandera:
Recommended revision to Figure: 30 TAC §298.380(c)(10):
Add a one-per-year pulse with Trigger: 1,890 cfs, Volume: 18,000, Duration: 18 days.
Add a one-per-two-year pulse with Trigger: 3,470 cfs, Volume: 34,500, Duration: 60 days
Add a one-per-five-year pulse with Trigger: 6,920 cfs, Volume: 50,000, Duration: 83 days

Medina River @ San Antonio:
Recommended revisions to Figure: 30 TAC §298.380(c)(11):
Add a one-per-year pulse with Trigger: 2,920 cfs, Volume: 30,400, Duration: 30 days.
Add a one-per-two-year pulse with Trigger: 6,020 cfs, Volume: 69,300, Duration: 60 days
Add a one-per-five-year pulse with Trigger: 9,940 cfs, Volume: 123,000, Duration: 90 days

San Antonio @ Elmendorf:
Recommended revisions to Figure: 30 TAC §298.380(c)(12)(B):
Add a pulse with Time Period: February-October, Frequency: 1 per time period, Trigger: 8,000 cfs, Duration: 2 days.
Add a pulse with Time Period: February-October, Frequency: 1 per time period, Trigger: 11,500 cfs, Duration: 2 days.

San Antonio @ Falls City:
Recommended revisions to Figure: 30 TAC §298.380(c)(13)(B):
Add a pulse with Time Period: February-October, Frequency: 1 per time period, Trigger: 8,000 cfs, Duration: 2 days.
Add a pulse with Time Period: February-October, Frequency: 1 per time period, Trigger: 11,500 cfs, Duration: 2 days.

Cibolo Creek @ Falls City:
Recommended revisions to Figure: 30 TAC §298.380(c)(14)(B):
Add a pulse with Time Period: February-October, Frequency: 1 per time period, Trigger:

5,000 cfs, Duration: 2 days.
Add a pulse with Time Period: February-October, Frequency: 1 per time period, Trigger: 8,000 cfs, Duration: 2 days.

Recommended revisions to Figure: 30 TAC §298.380(c)(15)(A):
There is an error in the GSA BBASC report that was carried over into the proposed standards that should be corrected. The Fall dry base number reads 367cfs. That number should read 167cfs. (The number is derived by taking the average of Oct, Nov, and Dec Base dry values from the TIFP numbers on page 114 of the BBASC report).
San Antonio @ Goliad:

Recommended revisions to Figure: 30 TAC §298.380(c)(15)(B):
Add a pulse with Time Period: February-October, Frequency: 1 per time period, Trigger: 11,500 cfs, Duration: 2 days.
Add a pulse with Time Period: February-October, Frequency: 1 per time period, Trigger: 14,000 cfs, Duration: 2 days.
Mission River @ Refugio:

Recommended revisions to Figure: 30 TAC §298.380(c)(16):
Add a one-per-year pulse with Trigger: 4,160 cfs, Volume: 22,800, Duration: 30 days.
Add a one-per-two-year pulse with Trigger: 6,830 cfs, Volume: 38,400, Duration: 36 days
Add a one-per-five-year pulse with Trigger: 11,500 cfs, Volume: 66,200, Duration: 44 days

Section 298.385. Water Right Permit Conditions.
Section 298.385 (a) and (b): Although it may often work out that "flow restriction special conditions" would be adequate to ensure compliance with the environmental flow standards, there is no need to constrain the commission's discretion in this manner. It simply is not possible now to predict precisely what types of permit applications the commission may be asked to consider in the future and the commission should retain flexibility to protect the flow standards. For example, consider the case of a proposed permit that, because of flow restriction special conditions, would comply with instream flow requirements but would slightly impair an applicable freshwater inflow requirement. TCEQ should retain the flexibility to include some other type of permit condition, besides a flow restriction, that would be sufficient to address the impairment if using that other type of condition would be the most efficient way to proceed. Nothing in S.B. 3 purports to limit the types of permit conditions to be used in protecting environmental flows. TCEQ should not unduly limit its options in this respect. Accordingly, the commenting parties recommend that Subsections (a) and (b) should be revised to reflect the following refinements:

(a) For water right permits with an authorization to store or divert water in the Guadalupe and San Antonio River Basins and the San Antonio-Nueces Coastal Basin, to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain ~~flow restriction~~ special conditions that are adequate to protect the environmental flow standards of this subchapter.

(b) For water right permits with an authorization to divert water in the Guadalupe and San Antonio River Basins and the San Antonio-Nueces Coastal Basin at a rate less than 20% of the pulse trigger level requirements of an applicable high flow pulse at a measurement point, as described in §298.380(c) of this title (relating to Environmental Flow Standards), and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain ~~flow restriction~~ special conditions that are adequate to protect the environmental flow standards of this subchapter; however, no special conditions are necessary to preserve or pass that applicable high flow pulse.

10% dedication

As discussed above, the 10% dedication requirement for new appropriations, as recommended by the GSA BBASC, is a necessary component of a package to contribute towards protecting a sound ecological environment. New appropriations, even when subject to other aspects of the flow standards, will reduce inflows to the bay system. Neither the BBASC recommended flow standards nor the proposed rules would be adequate to achieve the inflow levels recommended by the GSA BBEST as being adequate to support a sound ecological environment. In order to help offset those reduced inflows to some degree in order to get closer to supporting a sound ecological environment, the BBASC included the 10% dedication concept. The concept incorporates a flexible approach that would allow a permit holder to pursue alternate means of achieving the 10% amount without necessarily releasing water from the project. This type of permit condition is not unprecedented and is not inconsistent with SB 3. Accordingly, the commenting parties recommend that a new Subsection 298.385(c) be added to read as follows:

New Subsection 298.385 (c):

<u>(c) For water right permits with an authorization to store or divert more than 200 acre-feet per year of water in the Guadalupe or San Antonio River Basins or the San Antonio-Nueces Coastal Basin, to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall include, in addition to special conditions required pursuant to Subsection (a), a</u>

requirement that the water right holder dedicate, for purposes of helping to provide inflows to the San Antonio Bay System, a volume equivalent to 10% of the firm yield of the new authorization or, if there is no firm yield associated with the new authorization, a volume equivalent to 10% of the new annual authorized diversion amount. The holder of the water right may propose mechanisms to achieve compliance with the dedication requirement, including, but not limited to, releases from storage, dedication of return flows, or other strategies implemented either directly or through enforceable written commitments from the holders of other water rights or dischargers of groundwater-based return flows. In approving a dedication mechanism, the commission shall ensure that the dedication will result in the dedicated flows, although subject to reduction from naturally occurring transportation and evapotranspiration losses, being legally protected from diversion all the way to the estuary. Compliance with the volume aspect of the dedication requirement normally will be assessed on an annual basis and be measured at a point immediately downstream of the most downstream diversion point authorized by the new water right or amendment, but the commission may approve an alternate assessment period and measurement point that would be at least equally effective in providing inflows to the San Antonio Bay System and in contributing to attainment of the strategy target frequencies listed in Figures: 30 TAC §298.380(a)(1) and (a)(2).

Thank you for your consideration of our comments.
Respectfully Submitted,

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