



Via WMP2014@lcra.org

Water Management Plan Staff
Lower Colorado River Authority
3700 Lake Austin Blvd
Austin, TX 78703

Re: Comments and requests from August 25 stakeholder meeting

Dear Staff:

Thank you for making the documents from the Water Management Plan WAM Model available on the website on August 22, 2014 and the additional WAM overview. Having the data to review is an essential part of understanding and improving the way the model performs and providing confidence in the level of protection being provided for the Colorado River, Matagorda Bay and estuaries. The following is a discussion of my analysis of what this model run tells us about what can be expected from the WMP.

The "LCRA Water Management Plan - WAM Model Summary Output¹ ("Output Summary"), pages 2 and 3, point to the key concern regarding distribution of water for the Bays and Estuaries (B&E). Page 2, line 57 indicates the percent of months the Threshold inflow criteria are met with a goal of 100% to ensure that the bay and estuary systems survive the drought by maintaining refuge conditions in certain areas. The 2010 WMP and 2012 Application met these criteria in 97% of the months during the period of record and the 2014 Proposal only meets the criteria 94% of the months. More critically, page 3 indicates that during the Drought-of-Record, when the need for water in the bays and estuaries is most critical, the threshold criteria was met only 89% of the months in the 2012 Application and drops to 82% in the 2014 Proposal.

Threshold and MBHE 1-4 components drive the health of the bays and estuaries. Performance of the model under these criteria is indicated in page 8 of the WAM Output. Lines 52 and 57 indicate that the % of months threshold criteria is in effect drops from 9% in the 2012 Application to 6% in the 2014 Proposal, and the percent of months the criteria are met likewise drops from 97% to 94% during the period of record. Though a page is not provided for Drought-of-Record, it is expected that the drop in months met would mirror page 3; 89% dropping to 82%.

Though the average annual amount of water provided for B&E in the 2014 Proposal increases from the 2012 Application (from 61,190 acre-feet to 62,134 acre-feet), performance in months meeting the threshold and MBHE 1-3 criteria goes down while only months meeting MBHE 4 goes up. Our concern is that less water is being provided during the most critical drought periods, thereby threatening bay health and survival. From the discussion at the stakeholder meeting,² and analysis of the data, we speculate that this shift is caused by the way the annual and multi-year caps are structured and now linked together for all environmental flow components; more specifically the 50% limitation on storable inflows and the 25,000 af limitation on maximum releases. The "caps method" seems to cause more water to be available in "good times" and less water in critical drought periods.

¹ LCRA Water Management Plan - WAM Model Summary Output, posted on LCRA's website on August 22, 2014, pages 2 and 3.

² LCRA Stakeholder meeting, August 25, 2014, Rosebud Center.

Annual and Multi-year Caps ("caps method").

The "LCRA Water Management Plan - WAM Model Monthly Summary"³ (Monthly Summary") demonstrates the concerns discussed in our August 18, 2014 letter to the Board regarding the impacts of the annual and multi-year caps on environmental flows.

Annual and multi-year cap tables were used in the 2010 WMP⁴. However, in this instance, the tables were for specific environmental flow components and were linked directly with unqualified commitments to meet the flow component. For example, items (15) on instream flows, and (16) on bay and estuary needs contain multi-year tables establishing average annual targets with multi-year maximums. In both cases the tables were linked with unconditional commitments to meet the environmental flow needs as follows:

"Instream flow needs will be met by the release of stored water from Lakes Buchanan and Travis to maintain the daily river flows at no less than the critical flow needs *in all years*." [emphasis added], and

"Critical inflow needs of [the bay and estuaries] will be met *in all years* with releases of stored water from Lakes Buchanan and Travis." [emphasis added].

No triggers were used along with the caps. The trigger for caps (98% of managed available capacity) may be part of the reason water is driven toward "wet" months in the current proposal. The very high trigger causes artificial conditions to be created and to be in effect for almost the entire period of record. To be consistent with caps associated only with subsistence and threshold components, the trigger for the use of caps should be adjusted to coincide with instituting subsistence and threshold environmental flow conditions (probably around 1.0 - 1.4 MAF). This will likewise ensure that adequate environmental flows are provided without creating artificial limitations during average dry and wet conditions.

Bays and Estuaries Component

After review of WAM Monthly for Bays and Estuaries (B&E), we conclude again that the proposed "caps method" of limiting water for environmental flows does not appear to be reasonable or practicable. Pages 10-19 demonstrate that using an accounting methodology that lumps ALL environmental flow water into one amount that is distributed on an annualized basis with cap for annual and multi-years, causes a disproportional amount of water to be made available to the bay and estuaries (B&E) during "good times" (especially MBHE 4 component), while shorting these systems during "extraordinary" drought conditions (Threshold component). Of the 1,594,705⁵ AF of water provided for the B&E (page 12) only 9% (136,324⁶ AF; page 13) is provided for the threshold component (Table 1). As pointed out earlier, during Drought-of-Record this amount of water attains the threshold criteria only 82% of the time.

Of greater concern is the monthly and annual distribution of the water. The model does not deliver the *threshold component* water during the most critical drought years. On page 13 we see that water is made available for threshold flows in only 9 of the 145 months in the Drought-of-Record and only 6 months of the other three drought periods. Comparing the 15 months when water was

³ LCRA Water Management Plan, WAM Model Summarized Output, August 21, 2014 Prepared by Kennedy Resource Company.

⁴ LCRA 2010 WMP as amended January 27, 2010, item (15) page P-4 and item (16) page P-5.

⁵ Hand calculated from PDF table; some minor errors in calculating totals may occur.

⁶ Hand calculated from PDF table; some minor errors in calculating totals may occur.

provided with regulated flows⁷, 3 months the water was not needed to meet threshold, 4 months the water provided was not adequate to meet threshold, 4 months the water provided met threshold, and one month greatly exceeded threshold. Despite the fact that the model provided water for threshold flows in 15 months during drought conditions, 42 month did not met threshold (13% of drought conditions; Table 1 and page 15).

REQUEST 1: Since tabular output of storable inflows for each month was not provided, it is not possible to determine whether storable inflows were adequate to meet threshold conditions or whether the 50% limit on the amount of storable inflows under the "cap method" limited the amount of water provided for threshold environmental flows. We request that you compare the months when threshold was not met with storable inflows and provide an accounting of which months were limited by the cap method.

Table 1.⁸

LCRA 2014 Proposal (August) Data extracted from Monthly Summary tables as noted:

	Number of Months	Months Threshold Not Met (15)	Number of Consecutive Months	% Months Not Met	% Months Met	Water Provided for Threshold (13)	Water Provided for MBHE (OP60)(14)	Total Water Provided for B&E (12)
Non-Drought (N1)		2	0			2,355	116,780	49,135
Drought of Record (DOR)	145	26	*	18%	82%	60,428	177,725	238,153
Non-Drought (N2)		0				0	56,931	56,931
Drought (DR2)	46	1		2%	98%	22,410	45,105	67,515
Non-Drought (N3)		4				12,041	494,339	506,380
Drought (DR3)	54	2		4%	96%	0	88,041	88,041
Non-Drought (N4)		5				32,935	538,746	561,681
Drought- Current (DR4)	72	13	**	18%	82%	6,155	20,714	26,869
TOTAL Drought (DR)	317	42		13%	87%	88,993	331,585	420,578
TOTAL Non-Drought (N)	571	11		2%	98%	47,331	1,206,796	1,174,127
TOTAL Period of Record (POR)	888	53		6%	94%	136,324	1,538,381	1,594,705
Notes: DR = DROUGHT = Months inside drought box N = Non Drought = Months outside drought box in numbered order of occurrence * 7 x 1 month; 4 x 2 months; 1 x 3 months; 2 x 4 months ** 2 x 1 month; 2 x 2 months; 1 x 3 months; 1 x 4 months (12) Total Water Provided for B&E (13) Amount Provided for Threshold Component (14) Amount Provided for OP60 Component (15) Final Regulated Flow @ Matagorda Bay								

A key component of B&E health is salinity. The staff did not provide tables to indicated the number of months salinity is above the 27.5 ppt target and the number of consecutive months of stress above the target. These two parameters are the key in-the-bay indicators of attainment of threshold and MBHE goals.

Based on the above analysis, we re-iterate our concern: it is not reasonable that, as the duration of a drought extends over multiple years, the amount of water provided to meet the lowest level freshwater inflow to Matagorda Bay is arbitrarily reduced by application of an arbitrary set of rules. This lack of logic runs contrary to the stated objective of threshold flows: "*threshold, is a fixed*"

⁷ Comparing the amount of water delivered (page 13) with the regulated flows received in the bay for the same month (page 15).

⁸ Table was prepared by hand calculating the periods from the pages cited in the Monthly Summary.

monthly value to provide refuge conditions that would ideally be achieved 100% of the time,⁹ as prescribed by the science and stated in previous WMPs. Again, it is not reasonable to arbitrarily reduce this fixed monthly amount of water delivered to the bay during conditions that threaten the ecological integrity of the bay system by driving up salinity and increasing the risk that the bay system will be fundamentally and irreversibly damaged.

Request 2: Discussion at the August 25 stakeholder meeting indicated that sufficient water was available in the TCEQ combined models to provide "huge" amounts of water for B&E, yet the staff modified the criteria to artificially limit the amount of water for B&E. Therefore, we request that:

- 1) Staff provide an output summary that includes ONLY TCEQ recommended criteria so we can understand the base-line that LCRA was working from, and
- 2) Staff remove or modify the "cap model" to ensure that water distribution for B&E is shifted to maximize attainment goals:
 - a) Threshold at goal of 100%
 - b) MBHE 1 at goal of 90%
 - c) MBHE 2 at goal of 75%, and
 - d) High salinity months over 27.5 ppt are minimized and consecutive months of high salinity are minimized.

Instream Flow Component

An evaluation of WAM Monthly does not provide the information needed to make the same analysis on the instream flows for the river. Distribution of instream flows during periods of irrigation cut-off and curtailment, coinciding with extraordinary drought conditions, seem to be distributed to periods of subsistent demands/needs. When the periods of irrigation cut-off and containment are overlaid on tables 16 and 17, it appears that subsistence water is being made available during these critical periods of low river flow. Thus we see in Table 8 of the WAM Output (line 108) that subsistence instream flows at Wharton are met in 100% of the months consistent with the goal. Likewise, Base-Dry and Base-Average are met 81% and 62% of the time. Though these performance components are decreased from the 2012 Application (87% and 69%) this seems reasonable since irrigation water is cut-off a greater number of months. This distribution of water for instream flows seems reasonable.

Decoupling Environmental Flows and Ag

There are times in the annual cycle when it is reasonable that environment and agricultural use of water are handled in the same or similar manners. However, as was brought out during the discussion, there are times when this method of management breaks down. Linking the trigger for coming out of drought conditions during the seasons when water is never provided for agricultural use (October - March) is not logical and may limit opportunities to enhance environmental flows by taking advantage of hydrological events below the Highland Lakes.

Request 3: It would seem reasonable to consider a separate set of criteria for providing environmental flows during the period of second crop and the non-ag months. We therefore are requesting that the LCRA Proposal be run with bay inflows "de-coupled" from interruptible agricultural water at some point after the second crop decision point, rather than having the July 1 condition control inflow protection for 8 months.

LCRA Power Plant Demand

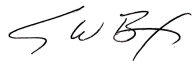
⁹ LCRA "Supplemental Filing May 2012", Section 2.4, page 2-10.

The LCRA, last year, obtained permits¹⁰ from the Lost Pines Groundwater Conservation District (LPGCD) for groundwater wells to support the power plant operations at Lake Bastrop. The permits are for 5,000 acre-feet per year for normal years and 10,000 acre-feet per year for certain drought conditions. Table 4, lines 5 and 6 of the WAM Output¹¹ indicate that the LCRA is carrying the 2010 and 2012 demand of 25,866 acre-feet per year through to the 2014 WMP Proposal. Groundwater is now being used as the PRIMARY source of water for the power plant and the four wells are operational¹².

REQUEST 4: The amount of surface water diverted by LCRA for power plant demand be reduced in the 2014 Proposal and the groundwater component handled in a similar way as the model handles Lakeside Irrigation District groundwater¹³.

Thank you for the opportunity to participate in this important public policy debate as we seek to develop a water management plan that provides for the diverse interests of our communities while protecting our environment.

Respectfully submitted,



Steve Box
Executive Director
Environmental Stewardship

cc: Myron Hess, National Wildlife Federation (WMP Advisory Committee Member)
Cindy Loeffler, Texas Parks and Wildlife Department (WMP Advisory Committee Member)
Jennifer Walker, Sierra Club (WMP Advisory Committee Member)
Judge Paul Pape, Bastrop County

Environmental Stewardship is a charitable nonprofit organization whose purposes are to meet current and future needs of the environment and its inhabitants by protecting and enhancing the earth's natural resources; to restore and sustain ecological services using scientific information; and to encourage public stewardship through environmental education and outreach. We are a Texas nonprofit 501(c) (3) charitable organization headquartered in Bastrop, Texas. For more information visit our website at <http://www.environmentstewardship.org/>.

¹⁰ Lost Pines Groundwater Conservation District permits for wells 5854919, 5854920, 5854921, and 5856922, issued May 15, 2013. Special condition (1)(a) If on January 1, the US Drought Monitor has classified Bastrop County as D2 (Drought-Severe), D3 (Drought-Extreme, or D4 (Drought-Exceptional), then permittee may withdraw an aggregated annual withdrawal amount of not more than 10,000 acre-feet per year. Condition (1)(b) In any other calendar year permittee may withdraw an aggregated annual withdrawal amount of not more than 5,000 acre-feet per year.

¹¹ LCRA Water Management Plan - WAM Model Summary Output, posted on LCRA's website on August 22, 2014, pages 4 and 5.

¹² Karen Bondy testimony to the LCRA Board Water Operations Committee on August 19, 2014. Greg Graml /David Wheelock testimony to Lost Pines Board on May 21, 2014.

¹³ Lakeside Groundwater: The model currently has 2,000 ac-ft/year of groundwater for Lakeside. The model provides a maximum of 2,000 ac-ft per year of groundwater, with no monthly amount greater than 500 ac-ft in any month between March and October. The model uses the allotted 500 ac-ft per month of groundwater supply prior to fulfilling the remaining monthly demand from run-of-river or stored water if necessary.