

**CONFORMED WATER MANAGEMENT
PLAN
FOR
WATER USE PERMIT No. 5851**



Brazos River Authority

Approved and Effective April 2, 2018

Table of Contents

	Page
Section I Overview of the Water Management Plan	1
A. Major Sections of the Water Management Plan	3
B. Revisions to the Water Management Plan	3
1. Required Updates to the Water Management Plan	3
2. Minor Amendments or Modifications to the Water Management Plan	4
3. Amendments to the Water Management Plan to Adjust Environmental Flow Conditions Based on Environmental Flow Standards Rule Changes	5
4. Evaluation of Drought Conditions	5
Section II Sources of Supply and Water Rights	6
A. Summary of BRA Reservoir System	6
B. Additional Water Rights	7
C. Contractual Rights to Water Supply	8
D. System Operation Permit	8
E. System Operation Permit – New Appropriation at Actual and Proposed Diversion Points	9
Section III Water Supply Contracting	16
A. Long-Term Contracts	16
B. Short-Term Contracts	24
C. Water Delivery and Customer Location	24
D. Future Contracts	24
Section IV Water Supply Operations	26
A. Water Supply System Overview	26
1. Reservoir Operations	26
2. Legal Constraints	26
3. Operational Considerations	26
B. System Operation Permit	29
C. System Order Modifications	30
D. Environmental Flows Under the System Operation Permit	31
1. Operating Guidelines to Manage Impacts on Reservoir Fisheries from Reservoir Level Fluctuations	31
2. Environmental Flows Special Conditions	32
a. Measurement Point Locations and Flow Levels	32
b. Applicable Measurement Points for Reaches	44
3. Operational Considerations Related to Environmental Flows	47
4. Run-of-River Diversion Rates	47
a. Diversion Rate Trigger Levels	47
b. Diversion Rates by River Segment	49
5. Annual Environmental Flows Achievement Report	50

Section V	Water Rights Accounting and Reporting	51
A.	Overview of the BRA Water Rights Accounting Plan	51
B.	Customer Water Use Accounting	52
C.	Daily Reservoir Accounting	53
D.	Appropriation Accounting Plan	53
1.	Environmental Flows.....	53
a.	Classification of High Flow Pulses	53
b.	Diversion and Storage of High Flow Pulses	54
2.	Return Flow Accounting Plan.....	54
3.	Bed and Banks Delivery Plan	55
4.	Diversion Points.....	56
5.	Firm and Non-Firm Water Availability by Location	57
6.	Reservoir Storage and Withdrawal Plans	57
a.	Accounting by Priority Date	57
b.	Conditions for Refilling Storage Emptied Under the System Operation Permit	59
c.	Accounting for High Flow Pulses Impounded Under the System Operation Permit	59

Tables

	Page
Table 2.1	Summary of Brazos River Authority Reservoir Water Rights6
Table 2.2	BRA Contractual Rights to Water Supply.....8
Table 2.3	Water Management Plan Appropriation Scenarios 12
Table 2.4	Maximum Diversions Under the System Operation Permit..... 14
Table 3.1	BRA Long-Term Contracts..... 16
Table 4.1	Summary of Estimated Channel Losses and Travel Times for Average Conditions 27
Table 4.2	Threshold Elevation by System Reservoir 31
Table 4.3A	Brazos River Near South Bend – USGS #08088000..... 33
Table 4.3B	Brazos River Near Palo Pinto – USGS #08089000 34
Table 4.3C	Brazos River Near Glen Rose – USGS #08089100..... 35
Table 4.3D	Brazos River Near Waco – USGS #08096500 36
Table 4.3E	Leon River Near Gatesville – USGS #08100500 37
Table 4.3F	Little River Near Little River – USGS #08104500 38
Table 4.3G	Little River Near Cameron – USGS #08106500 39
Table 4.3H	Brazos River at SH21 Near Bryan – USGS #08108700 40
Table 4.3I	Navasota River Near Easterly – USGS #08110500..... 41
Table 4.3J	Brazos River Near Hempstead – USGS #08111500 42
Table 4.3K	Brazos River Near Richmond – USGS #08114000 43
Table 4.3L	Brazos River Near Rosharon – USGS #08116650 44
Table 4.4	WMP Reaches with Applicable SB3 Measurement Points..... 45
Table 4.5	Diversion Rate Trigger Levels for Measurement Points..... 48
Table 4.6	Maximum Aggregated Diversion Rate for River Diversions in Each Segment 49
Table 5.1	Accounting Plan Diversion Reaches..... 55

Section I

Overview of the Water Management Plan

This Water Management Plan (WMP) is part of and incorporated into the Brazos River Authority's (BRA) Water Use Permit No. 5851 (System Operation Permit). This WMP governs the operating principles upon which decisions are made for diversion, storage, and use of water appropriated under the System Operation Permit. The BRA submitted with this WMP its Technical Report in Support of the Water Management Plan (WMP Technical Report), dated November 28, 2012, as revised on June 12, 2013 and updated in May 2014 following TCEQ's adoption of SB3 rules for the Brazos River basin. This Conformed WMP (including WMP Technical Report and Appendices) was further revised with conforming changes, approved by the Executive Director, based on the Commission's Final Order dated September 16, 2016 approving issuance of the System Operation Permit and the Permit itself, issued on November 30, 2016. The WMP Technical Report is part of the WMP and serves the following functions:

1. to include background material that provides context for the development of the WMP;
2. to provide supporting materials, such as the Little River Watershed Study and the evaluation of Operating Guidelines to Manage Impacts on Reservoir Fisheries, on which the management strategies and methodologies included in the WMP are based; and
3. to include the accounting plan and water availability models.

This Water Management Plan has been modified only to the extent necessary to reflect the Commission's September 16, 2016 Order, including its adopted approach on return flows and otherwise regarding its determinations regarding the amount of appropriation.¹ As part of these conforming changes, the revised Accounting Plan

¹ BRA notes that the issued Permit contains a clerical error, located in one recital and in Paragraph 1.B.(2), incorrectly referencing the established amount of BRA Return Flows as 47,322 af/yr, when the hearing record and the Order have recognized that amount as 47,332 af/yr. Throughout the components of this Conformed WMP, including the WMP Technical

submitted herewith and outlined in Section V below, and the exhibits listed below, are incorporated into this Water Management Plan, and corresponding changes have also been made in the WMP Technical Report. Otherwise, the WMP Technical Report and Appendices remain in the form considered in the 2015 hearing conducted by the State Office of Administrative Hearings (SOAH) and subsequently by the Commission; those WMP components, considered as a whole, will be updated and superseded through the future process of considering BRA's first required amendment of its Water Management Plan, as discussed in Section I.B below. In order to accurately reflect the Commission's action several exhibits have been added to this Water Management Plan:

(A) the Commission's September 16, 2016 Order;

(B) a Summary of Authorized Return Flow Discharges Within the Permit, in a series of tables listing all return flows that BRA is appropriated and authorized to use, and showing which are BRA Return Flows and which are Return Flows of Others, as defined in Section II.D below;²

(C) a Table of Maximum Annual Use Under the System Operation Permit by Reach;³ and

Report and the Accounting Plan, the correct amount of 47,332 af/yr has been used for BRA Return Flows. At the first available future opportunity, BRA will request that this clerical error be corrected in the System Operation Permit pursuant to TCEQ Rule § 297.61.

² Table 1 of Exhibit B is also included as Table 2.22 in the Conformed WMP Technical Report; Table 2 of Exhibit B is also included as Table 2.23 in the Conformed WMP Technical Report; and Table 3 of Exhibit B is also included as Table 2.24 in the Conformed WMP Technical Report. "BRA Return Flows" include return flows from plants owned or operated by BRA as well as return flows from water supplied by BRA. These tables also correspond with the recitals in the System Operation Permit wherein TCEQ has identified the specific sources of treated wastewater discharges that comprise the return flows appropriated to BRA under the System Operation Permit.

³ This table, which is also included as Table 2.21 in the Conformed WMP Technical Report, supersedes Tables G.3.14 through G.3.25 from Appendix G-3 of the WMP Technical Report. It provides the maximum diversion for each reach and shows the 14% reduction approved by the Commission.

(D) the BRA Accounting Plan.⁴

A. Major Sections of the Water Management Plan

This WMP contains the following sections:

Section I – Overview of the Water Management Plan

Section II – Sources of Supply and Water Rights

Section III – Water Supply Contracting

Section IV – Water Supply Operations

Section V – Water Rights Accounting and Reporting

B. Revisions to the Water Management Plan

1. Required Updates to the Water Management Plan

The BRA will submit an application for a revised WMP with the Texas Commission on Environmental Quality (TCEQ) no later than the tenth (10th) anniversary of the date this WMP is final and non-appealable. Such application may seek reconsideration of the entire WMP and may request additional amendments thereto. The BRA will also submit any other applications as may be otherwise required by this WMP. The BRA may also submit, as needed, applications to amend or modify portions of the WMP during the interim period before the BRA is required to submit an application pursuant to the 10-year WMP review requirement in the System Operation Permit. Unless qualifying as minor amendments or modifications, such applications for reconsideration or

⁴ The Accounting Plan has been revised, as approved by the Executive Director, to account for return flows under Texas Water Code §§ 11.042 and 11.046(c), as required by the Commission. A complete electronic copy of the conformed Accounting Plan, including the textual discussion and each of the Excel workbooks that comprise the Accounting Plan, is attached hereto on a CD.

amendment of the WMP shall be subject to the applicable TCEQ notice and contested case hearing requirements.

2. Minor Amendments or Modifications to the Water Management Plan

The following types of revisions to the WMP could be considered minor amendments or modifications so long as they do not otherwise require notice and opportunity for a contested case hearing, although they may be subject to an expedited public review process:

1. The addition of diversion points, as provided by Section 297.102(b) of Title 30 of the Texas Administrative Code, consistent with the diversion limitations for the reach in which the diversion point is located (Table 4.6);
2. Modifications to the water accounting plan;
3. Modifications to the water availability models to address changed conditions, such as modifications to the amount of available return flows;
4. Changes to the WMP to ensure that BRA's operations are consistent with adopted environmental flow rules for the Brazos River basin;
5. The selection of a new measurement point in the event that the United States Geological Survey (USGS) ceases the operation of any such streamflow gages identified in the System Operation Permit;
6. Modifications to the estimated channel losses and travel times (Table 4.1); and
7. Similar modifications that do not require notice and an opportunity for a contested case hearing pursuant to Section 295.158 of Title 30 of the Texas Administrative Code.

All of these types of revisions and modifications require prior approval by the Executive Director of the TCEQ.

The BRA is not required to submit for approval any updates or amendments to the information or documents contained in the WMP Technical Report (including the Technical Appendices) if TCEQ review and approval of such information or documents

is not otherwise required by Chapter 11 of the Texas Water Code, TCEQ rules, or this WMP.

3. Amendments to the Water Management Plan to Adjust Environmental Flow Conditions Based on Environmental Flow Standards Rule Changes

Upon petition of the Executive Director of the TCEQ, the environmental flow special conditions contained in the WMP may be adjusted to achieve compliance with adopted environmental flow standards. Amendments under this provision may occur based on future amendments to the adopted environmental flow standards. Any such petition to amend the WMP on this basis will be subject to the procedural and other requirements outlined in Section 298.25 of Title 30 of the Texas Administrative Code.

4. Evaluation of Drought Conditions

In recognition of recent drought conditions, Special Condition 5.C.7 of the System Operation Permit requires that BRA perform a detailed evaluation of whether the drought ending in May 2015 represents a drought worse than the drought of the 1950s, and whether that recently ended drought decreases the amount of water available for appropriation under the System Operation Permit. BRA provided the required report to the TCEQ documenting its findings, meeting the June 16, 2017 deadline following issuance of the System Operation Permit. That evaluation, which concluded that the drought ending in May 2015 does not decrease the amount of water available for appropriation under the Permit, has been reviewed and accepted by TCEQ staff.

Section II

Sources of Supply and Water Rights

The following sources of water supply and water rights make up the BRA System and are authorized to be operated as a system pursuant to the System Operation Order (System Order), the System Operation Permit, and this WMP.

A. Summary of BRA Reservoir System

The BRA stores water in the three reservoirs it owns and operates: Possum Kingdom Lake, Lake Granbury, and Lake Limestone. The BRA also contracts for conservation storage space in eight U.S. Army Corps of Engineers (USACE) reservoirs in the Brazos basin: Lakes Proctor, Belton, Stillhouse Hollow, Georgetown, Granger, Somerville, Whitney, and Aquilla. BRA reservoir water rights may be summarized as follows:

Table 2.1 Summary of Brazos River Authority Reservoir Water Rights

Water Right ID	Reservoir Name	Authorized Storage (acft)	Priority Date	Priority Diversion (acft/yr)	Max Diversion Rate (cfs)	*System Order Diversions	
						Amount (acft/yr)	Type Use
COA 12-5155	Possum Kingdom	724,739	4/6/1938	230,750	Unspecified	175,000	Mun
						250,000	Ind
						250,000	Irr
						49,800	Min
						--	Hydro
COA 12-5156	Granbury	155,000	2/13/1964	64,712	Unspecified	40,000	Mun
						45,000	Ind
						14,500	Irr
						500	Min
COA 12-5157	Whitney	50,000	8/30/1982	18,336	5,000	25,000	Mun
						25,000	Ind
COA 12-5158	Aquilla	52,400	10/25/1976	13,896	2,100 releases through dam & 90 from reservoir perimeter	17,000	Mun
						18,200	Ind
						200	Min
COA 12-5159	Proctor	59,400	12/16/1963	19,658	Unspecified	18,000	Mun
						17,800	Ind
						18,000	Irr
						200	Min
COA 12-5160	Belton	457,600	12/16/1963	100,257	Unspecified	95,000	Mun
						150,000	Ind
						149,500	Irr
						500	Min

Water Right ID	Reservoir Name	Authorized Storage (acft)	Priority Date	Priority Diversion (acft/yr)	Max Diversion Rate (cfs)	*System Order Diversions	
						Amount (acft/yr)	Type Use
COA 12-5161	Stillhouse Hollow	235,700	12/16/1963	67,768	Unspecified	74,000	Mun
						74,000	Ind
						73,700	Irr
						300	Min
COA 12-5162	Georgetown	37,100	2/12/1968	13,610	Unspecified	16,500	Mun
						16,400	Ind
						4,100	Irr
						100	Min
COA 12-5163	Granger	65,500	2/12/1968	19,840	Unspecified	30,000	Mun
						29,800	Ind
						5,500	Irr
						200	Min
COA 12-5164	Somerville	160,110	12/16/1963	48,000	Unspecified	49,500	Mun
						50,000	Ind
						50,000	Irr
						500	Min
COA 12-5165	Limestone	225,400	5/6/1974 for 217,494 acft & 9/4/1979 for 7,906 acft	65,074	Unspecified	69,500	Mun
						77,500	Ind
						70,000	Irr
						500	Min
P 2925B	Allens Creek	145,533	9/1/1999	202,000 from Brazos, 99,650 from reservoir	2,200 from Brazos, 300 from perimeter of reservoir, and 700 downstream releases		
*The total amount of water diverted or released from any one System reservoir for a particular purpose may exceed the authorization for that purpose under that reservoir's certificate of adjudication, but may not exceed the total authorized diversions for all purposes from that reservoir in any calendar year. COA = Certificate of Adjudication Mun = Municipal Irr = Irrigation Ind = Industrial Min = Mining							

B. Additional Water Rights

Other water rights making up part of the BRA System include the following:

- Excess Flows Permit – Certificate of Adjudication (COA) No. 12-5166, as amended;
- System Order – Originally adopted July 23, 1964, amended and incorporated into BRA's reservoir water rights; and

- Interbasin Transfer Rights – COA No. 12-5167, COA No. 12-5155 (Possum Kingdom Lake water right), and COA No. 12-5156 (Lake Granbury water right).

C. Contractual Rights to Water Supply

The BRA has contracted for the following additional water supplies, which contribute to the System:

Table 2.2 BRA Contractual Rights to Water Supply

Water Supply Agreement	Annual Amount (acft)	Effective Date	End Date
Colorado(LCRA)	25,000	10-05-2001	10-9-2050
Hubbard Creek	14,000	03-10-2005	Perpetual (Life of Water Rights)
Stamford	3,000	9-10-2001	8-31-2041
Palo Pinto	1,000	8-31-2007	Perpetual (Life of Water Rights)

D. System Operation Permit

Significant provisions of the System Operation Permit include the following:

- Appropriation of Water – Authorizes diversion, impoundment and use of previously unappropriated state water. The amount that is available depends upon the applicable Demand Scenario, with the maximum authorized annual use being 516,955 acre-feet. These maximum diversion and use amounts are set out in Table 2.4 below.
- Return Flows – Authorizes the use of return flows discharged into state watercourses that are not authorized for use by the discharger or some other party. The Commission’s adopted approach on return flows includes a new appropriation to BRA with two distinct categories of return flows: the bed and banks authorization under Texas Water Code § 11.042(b) and (c) for those return flows from BRA water supplies or discharged from plants owned or operated by BRA (defined as BRA Return Flows); and return flows discharged from other sources, authorized under Texas Water Code §§ 11.046 and 11.121 (defined as Return Flows of Others). The amount of BRA’s appropriation of the return flows

of others is subject to reduction under some circumstances. BRA's storage, diversion and use of that portion of the appropriation based on surface water based return flows is interrupted by direct reuse and is terminated by indirect reuse in cases where the discharger of those flows obtains a § 11.042(c) authorization to divert its own return flows. Similarly, BRA's storage, diversion and use of groundwater based return flows is interrupted by direct reuse and is terminated by indirect reuse in cases where the discharger of those flows obtains a § 11.042(b) authorization to divert its own return flows. BRA shall not oppose an application for such an authorization under § 11.042(c) or § 11.042(b) on the basis of its own claim to those flows. Throughout this WMP, references to "Return Flows" reflect this approach adopted by the Commission in approving the System Operation Permit, and the term "Return Flows" encompasses both BRA Return Flows and Return Flows of Others.

- Bed and Banks – Authorizes the use of the bed and banks of the Brazos River below Possum Kingdom Lake and of the Brazos River tributaries below lakes Proctor, Belton, Stillhouse Hollow, Georgetown, Granger, Somerville, Aquilla and Limestone for conveyance, storage, and subsequent diversion of appropriated water, including Return Flows, subject to identified losses and special conditions.
- Diversion Points – Authorizes the diversion and use of appropriated water at diversion points authorized under BRA's water rights, and locations identified and included in this WMP.
- Other Conditions – Contains numerous other special conditions including, but not limited to, conditions regarding the WMP, adopted environmental flow standards, and accounting requirements.

E. System Operation Permit – New Appropriation at Actual and Proposed Diversion Points

The appropriation that is available under the System Operation Permit, using actual and proposed diversion points, is set forth below. For these analyses, this section:

- Determines water availability with existing BRA contracts modeled at their actual diversion locations, and projected demands from the BRA System identified in the regional water plans and other studies;
- Determines the System Operation Permit appropriation needed to satisfy existing BRA contracts and projected water supply needs identified in the regional water plans and other studies;
- Determines the additional firm and non-firm supply that could be available from the BRA System after satisfying existing BRA contracts and demands identified in the regional water plans and other studies, as well as the System Operation Permit appropriation associated with this additional supply; and
- Evaluates how the use of the System Operation Permit appropriation changes based on diversions made to meet water needs for the proposed expansion at the Comanche Peak Nuclear Power Plant (CPNPP), and the construction of Allens Creek Reservoir.

The firm supply from the BRA System is analyzed in two ways. The first way, referred to as the Variable Demand Scenarios, has a large water supply component that is only used when called for by BRA customers. Many of the larger BRA customers have their own water rights; the Variable Demand Scenarios assume that these customers use their own water rights first, only using BRA contract water during drier periods. These scenarios represent the supply of the BRA System based on expected operations, but are not the basis for the System Operation Permit appropriation. The second way, referred to as the Firm Use Scenarios, looks at the firm yield of the BRA System using only the BRA System water rights, including the System Operation Permit. In these Firm Use Scenarios all BRA contracts are assumed to be fully exercised in each year.

The analyses underlying the WMP's determination of the new appropriation available under the System Operation Permit are described in more detail in Section 2.4 of the WMP Technical Report. As conditions change in the future, the way that BRA uses the System Operation Permit appropriation may change. These changes will be addressed in future WMPs.

Table 2.3 shows the Appropriation Scenarios developed for this analysis. These scenarios were designed to determine the impact of return flows, the Allens Creek Reservoir, and the proposed expansion at the CPNPP (Units 3 and 4) on the potential use of appropriations by the BRA under its other water rights and the System Operation Permit. Four different demand levels are used in the scenarios, referred to using the letters A through D. All of these scenarios assume full use of existing BRA contracts as described above for the Variable Demand and Firm Use scenarios, and they include projected regional water plan demands for the System Operation Permit. The demands change because of assumptions about the CPNPP expansion and the presence of Allens Creek Reservoir. These projects are addressed separately because of their significant impact on water supply. Demand levels A and C do not have the CPNPP expansion. Demand levels B and D assume that the CPNPP expansion is in place. Demand levels A and B do not have Allens Creek Reservoir, while demand levels C and D assume that supplies are available from this source.

Table 2.3 Water Management Plan Appropriation Scenarios

Scenario	CPNPP Expansion	Allens Creek Reservoir
Demand Level A	N	N
Demand Level B	Y	N
Demand Level C	N	Y
Demand Level D	Y	Y

The demands for each reach of the river under alternative scenarios, for both the Firm Use and Variable Demand analyses, are provided and discussed in Section 2.4 of the WMP Technical Report.

Table 2.4 below⁵ shows the maximum annual diversions of water authorized under the System Operation Permit. The volumes shown within the first row (“Total Permitted Diversions”) in Table 2.4 include the appropriation amounts from Paragraph 1.A. USE of the Permit and BRA Return Flows authorized in Paragraph 1.B.(2) of the Permit. The Commission’s Final Order required that BRA’s annual diversion and use under the System Operation Permit and this WMP (except for BRA Return Flows) be immediately reduced by 14% of the amounts authorized in Paragraph 1.A. USE of the Permit, due to sedimentation in BRA’s reservoirs, subject to Special Condition 5.D.5.b. Therefore, this table has also been conformed to show the amounts of maximum annual appropriation with that 14% reduction, as required under Special Condition 5.D.5.a. The final row of Table 2.4 shows the Total Authorized Diversions under the System Operation Permit. The volumes of the total authorized diversions include the reduced authorized amounts set out in Paragraphs 5.D.5)a.1. through 4. of the Permit and BRA Return Flows authorized in Paragraph 1.B.(2) of the Permit.

Subject to Special Condition 5.D.5.b, the maximum annual use for each reach is also limited to 86% of the largest maximum annual diversion under the “SysOp” for that

⁵ This table is also included as Table 2.20 in the Conformed WMP Technical Report.

reach in Tables G.3.14 through G.3.25 of Appendix G-3 of the WMP Technical Report, for the firm appropriation demand scenario that is applicable during the year in which water is diverted, or 1,460 acre-feet, whichever is greater. These 14% reductions by reach are shown in Exhibit C to this Water Management Plan.

**Table 2.4 Maximum Diversions Under the System Operation Permit
(acft/yr)**

Demand Level	Level A – Current Contracts	Level B – Current Contracts with CPNPP Expansion	Level C – Current Contracts with Allens Creek	Level D – Current Contracts with Allens Creek and CPNPP Expansion
Total Permitted Diversions	381,068	344,625	516,955	482,035
BRA Return Flows	47,332	47,332	47,332	47,332
Maximum Diversion without 14% Reduction⁶	333,736	297,293	469,623	434,703
Maximum Diversion with 14% Reduction⁷	287,013	255,672	403,876	373,845
Total Authorized Diversions	334,345	303,004	451,208	421,177

In the future, BRA may use uncommitted firm yield capacity under the System Operation Permit to develop additional non-firm supply that is available on a 75/75 basis (75% of the water, 75% of the time). Table 2.14 in Section 2.4.4 of the Technical Report shows potential 75/75 non-firm supplies at the Rosharon gage under the four demand levels with and without return flows. Maximum annual non-firm supplies of up to 440,760 acft/yr could be developed under certain conditions. However, because future updates to this WMP will be required prior to BRA supplying non-firm water contracts under the System Operation Permit, and because the prior WMP non-firm modeling did not include return flows in the manner authorized in the Final Permit, the former Table 2.5 has been deleted from this Conformed WMP.

⁶ These maximum annual diversion amounts exclusive of BRA Return Flows are the annual diversion and use authorization amounts set out in Paragraph 1.A. of the System Operation Permit, subject to Special Condition 5.D.5)a. therein.

⁷ These maximum annual diversion amounts exclusive of BRA Return Flows are the reduced annual diversion and use authorization amounts set out in Special Condition 5.D.5)a. of the System Operation Permit, subject to Special Condition 5.D.5)b. therein.

The supplies that are shown in this and other sections of this WMP are available assuming full use of all existing priority rights held by BRA and others. These analyses only use unappropriated water that is available after meeting the environmental flow conditions set out in this WMP. Therefore, the System Operation Permit does not impair existing water rights or vested riparian rights.

Furthermore, the newly approved Watermaster for the lower Brazos basin is expected to be in operation by the time diversions under the System Operation Permit are implemented. BRA will conduct its operations under the System Operation Permit, as with its other existing water rights, in compliance with TCEQ's rules governing watermaster operations, found in Chapter 304 of Title 30 of the Texas Administrative Code. The Brazos Basin Watermaster will be responsible for overseeing the priority system within the lower basin (Possum Kingdom Lake and below), further protecting existing water rights.

Section III

Water Supply Contracting

A. Long-Term Contracts

The BRA, as of November 1, 2012, has 146 long-term water supply contracts providing for the diversion and use of approximately 696,719 acft/yr. The BRA also has two subordination agreements. Table 3.1 lists these contracts and agreements and summarizes their essential elements.

Table 3.1 BRA Long-Term Contracts

BRA Contract Name	Use Type	Diversion Location	Annual Amount (acft)
439 WATER SUPPLY CORP.	MU	Lake Belton	560
439 WATER SUPPLY CORP.	MU	Lake Belton	849
ABILENE, CITY OF	SUB	Possum Kingdom Lake	14,000
ACTON MUNICIPAL UTILITY DIST.	MU	Lake Granbury	1,000
ACTON MUNICIPAL UTILITY DIST.	MU	Lake Granbury	4,000
ACTON MUNICIPAL UTILITY DIST.	MU	Lake Granbury	2,000
ALL SEASONS TURF GRASS	IR	Hempstead gage to Richmond gage	50
ALUMINUM COMPANY OF AMERICA	IN	Little Rv/ San Gabriel Rv confluence to Little Rv nr Cameron gage	5,000
AQUILLA WATER SUPPLY DISTRICT	MU	Lake Aquilla	5,953
BASA RESOURCES INC.	MI	Possum Kingdom Lake	1,000
BELL CO. WATER CONTROL & IMP.	MU	Lake Belton	3,000
BELL CO. WATER CONTROL & IMP.	MU	Lake Stillhouse Hollow	10,000
BELL COUNTY WCID #1	MU	Lake Belton	49,509

BRA Contract Name	Use Type	Diversion Location	Annual Amount (acft)
BELTON, CITY OF	MU	Lake Belton	2,500
BLUEBONNET WATER SUPPLY CORP.	MU	Lake Belton	1,600
BLUEBONNET WATER SUPPLY CORP.	MU	Lake Belton	567
BLUEBONNET WATER SUPPLY CORP.	MU	Lake Belton	1,450
BLUEBONNET WATER SUPPLY CORP.	MU	Lake Belton	4,684
BOSQUE GENERATING, L. P.	IN	Lake Whitney Dam to Aquilla Creek/Brazos Rv confluence	6,500
BRAZOS ELECTRIC POWER COOP	IN	Possum Kingdom Lake	8,000
BRAZOS ELECTRIC POWER COOP.	OT	Possum Kingdom Lake Dam to Palo Pinto gage	3,600
BRENHAM, CITY OF	MU	Lake Somerville	4,200
BRUSHY CREEK MUD	MU	Lake Georgetown	4,000
CARR-THOMAS RANCH	IR	Palo Pinto gage to Dennis gage	50
CENTRAL TEXAS WSC	MU	Lake Stillhouse Hollow	895
CENTRAL TEXAS WSC	MU	Lake Stillhouse Hollow	1,000
CENTRAL TEXAS WSC	MU	Lake Stillhouse Hollow	100
CENTRAL TEXAS WSC	MU	Lake Stillhouse Hollow	3,100
CENTRAL TEXAS WSC	MU	Lake Stillhouse Hollow	6,950
CHISHOLM TRAIL SUD	MU	Lake Georgetown	4,760
CHISHOLM TRAIL SUD	MU	Lake Georgetown	6,340
CITATION OIL & GAS	MI	Possum Kingdom Lake	175
CLEBURNE, CITY OF	MU	Lake Whitney	4,700

BRA Contract Name	Use Type	Diversion Location	Annual Amount (acft)
CLEBURNE, CITY OF	MU	Lake Aquilla	5,300
CLEBURNE, CITY OF	MU	Lake Whitney	5,000
CORYELL CITY WATER SUPPLY DIST	MU	Lake Belton	300
COUNTRY HARVEST	IR	Lake Stillhouse Hollow Dam to Lampasas Rv nr Belton	8
DECORDOVA BEND STATES OWNERS	IR	Lake Granbury	100
DECORDOVA BEND STATES OWNERS	IR	Lake Granbury	300
DOG RIDGE WSC	MU	Lake Stillhouse Hollow	1,500
DOUBLE DIAMOND/CLIFFS	MU	Possum Kingdom Lake	1,000
DOW PIPELINE COMPANY	IN	Richmond gage to Rosharon gage	16,000
EAST WILLIAMSON CO WATER	MU	Lake Granger	13,000
EXELON GENERATION CO, LLC	IN	Lake Granbury	10,000
FORT GATES WSC	MU	Lake Belton	200
FORT GRIFFIN SUD	MU	Possum Kingdom Lake	353
FRED T. OWEN, JR.	MU	Lake Whitney	60
GATESVILLE, CITY OF	MU	Lake Belton	4,000
GATESVILLE, CITY OF	MU	Lake Belton	450
GATESVILLE, CITY OF	MU	Lake Belton	248
GATESVILLE, CITY OF	MU	Lake Belton	1,200
GEORGETOWN, CITY OF	MU	Lake Georgetown	10,000
GEORGETOWN, CITY OF	MU	Lake Georgetown	6,720

BRA Contract Name	Use Type	Diversion Location	Annual Amount (acft)
GEORGETOWN, CITY OF	MU	Lake Georgetown	15,448
GRAHAM, CITY OF	MU	Possum Kingdom Lake	1,000
GRANBURY RECREATIONAL ASSOC	IR	Lake Granbury	50
GRANBURY, CITY OF	MU	Lake Granbury	10,800
GULF COAST WATER AUTHORITY	IN	Hempstead gage to Richmond gage	30,020
GULF COAST WATER AUTHORITY	IN	Richmond gage to Rosharon gage	9,335
HARKER HEIGHTS, CITY OF	MU	Lake Stillhouse Hollow	300
HARKER HEIGHTS, CITY OF	MU	Lake Belton	3,235
HIGH GABRIEL WATER SUPPLY CORP	MU	Lake Stillhouse Hollow	310
HILL COUNTRY HARBOR VILLAGE	IR	Possum Kingdom Lake	250
HORIZON TURF GRASS, INC.	IR	Little Brazos confluence to Brazos at Hwy 21 Bryan	200
HORIZON TURF GRASS, INC.	IR	Brazos at Hwy 21 Bryan to Yegua Brazos confluence	150
JARRELL-SCHWERTNER WTR SUPPLY	MU	Lake Stillhouse Hollow	1,000
JERRY GLAZE	IR	Lake Stillhouse Hollow	100
JOHNSON COUNTY RWSC	MU	Lake Granbury	13,210
JONAH SPECIAL UTILITY DIST.	MU	Lake Georgetown	1,239
JONAH SPECIAL UTILITY DISTRICT	MU	Lake Georgetown	1,200
KEMPNER WATER SUPPLY CORP.	MU	Lake Stillhouse Hollow	2,650
KEMPNER WATER SUPPLY CORP.	MU	Lake Stillhouse Hollow	2,000
KEMPNER WATER SUPPLY CORP.	MU	Lake Stillhouse Hollow	2,000

BRA Contract Name	Use Type	Diversion Location	Annual Amount (acft)
KEMPNER WATER SUPPLY CORP.	MU	Lake Stillhouse Hollow	1,750
KEMPNER WATER SUPPLY CORP.	MU	Lake Stillhouse Hollow	500
KEY ENERGY SERVICES, LLC	MI	Dennis gage to Lake Granbury	44
KING RANCH TURFGRASS, LP	IR	Lake Granbury	760
KING RANCH TURFGRASS, LP	IR	Yegua Brazos confluence to Navasota Brazos confluence	540
LAKE PROCTOR IRR AUTHORITY	IR	Lake Proctor	3,743
LAKE WHITNEY WATER COMPANY	MU	Lake Aquilla	150
LAMPASAS, CITY OF	MU	Lake Stillhouse Hollow	1,000
LAMPASAS, CITY OF	MU	Lake Stillhouse Hollow	2,000
LAMPASAS, CITY OF	MU	Lake Stillhouse Hollow	500
LENMO INC.	IR	Lake Granbury	1,650
LENMO INC.	IR	Lake Granbury	350
LIBERTY HILL WATER SUPPLY CORP	MU	Colorado Basin	600
LORENA, CITY OF	MU	Aquilla Creek/ Brazos Rv confluence to Highbank gage	1,000
LSF DEVELOPMENT CORP.	MU	Lake Granbury	90
LUBBOCK, CITY OF	MU	Possum Kingdom Lake	961
LUBBOCK, CITY OF	SUB	Possum Kingdom Lake	400
MARLIN, CITY OF	MU	Aquilla Creek/ Brazos Rv confluence to Highbank gage	1,200
MCGREGOR, CITY OF	MU	Lake Belton	810
MOFFAT WATER SUPPLY CORP	MU	Lake Belton	500

BRA Contract Name	Use Type	Diversion Location	Annual Amount (acft)
MONARCH UTILITIES I, L.P.	MU	Lake Granbury	600
MT LAKES RANCH PROPERTY	IR	Lake Granbury Dam to Glen Rose gage	200
NORTH LEON RIVER IRR CORP	IR	Lake Proctor Dam to Leon Rv at Gatesville	2,909
NORTH RIDGE CORPORATION	MI	Possum Kingdom Lake	235
NRG TEXAS POWER, LLC	IN	Lake Limestone	7,837
NRG TEXAS, LLC	IN	Lake Limestone	5,026
NRG TEXAS, LLC	IN	Lake Limestone	8,974
NRG TEXAS, LLC	IN	Hempstead gage to Richmond gage	83,000
OAK GROVE MANAGEMENT, LLC	IN	Lake Limestone	3,838
PARKER COUNTY SUD	MU	Dennis gage to Lake Granbury	700
PECAN GROVE MUD	MU	Richmond gage to Rosharon gage	700
PECAN GROVE MUD	MU	Richmond gage to Rosharon gage	3,100
PECAN PLANTATION OWNER'S ASSOC	IR	Lake Granbury	250
PECAN PLANTATION OWNERS ASSOC.	IR	Lake Granbury	500
POSSUM KINGDOM WSC	MU	Possum Kingdom Lake	750
RANCH OWNER'S ASSOCIATION	IR	Possum Kingdom Lake	250
REX R. WORRELL	IR	Lake Granbury	300
RICHMOND, CITY OF	MU	Richmond gage to Rosharon gage	172
RICHMOND, CITY OF	MU	Richmond gage to Rosharon gage	2,760

BRA Contract Name	Use Type	Diversion Location	Annual Amount (acft)
ROSEBUD, CITY OF	MU	Aquilla Creek/ Brazos Rv confluence to Highbank gage	100
ROSENBERG, CITY OF	MU	Richmond gage to Rosharon gage	4,500
ROUND ROCK, CITY OF	MU	Colorado Basin	9,484
ROUND ROCK, CITY OF	MU	Colorado Basin	4,500
ROUND ROCK, CITY OF	MU	Lake Georgetown	6,720
ROUND ROCK, CITY OF	MU	Colorado Basin	6,944
ROUND ROCK, CITY OF	MU	Lake Georgetown	18,134
SALADO WATER SUPPLY CORP.	MU	Lake Stillhouse Hollow	800
SALADO WATER SUPPLY CORP.	MU	Lake Stillhouse Hollow	800
SLC WATER SUPPLY	MU	Lake Limestone	200
SOUTH TEXAS WATER CO.	IR	Richmond gage to Rosharon gage	5,625
SPORTSMAN'S WORLD M.U.D.	MU	Possum Kingdom Lake	125
STAMFORD, CITY OF	MU	Possum Kingdom Lake	1,820
STEPHENS COUNTY RURAL WSC	MU	Possum Kingdom Lake	800
SUGAR LAND, CITY OF	MU	Richmond gage to Rosharon gage	4,588
SUGAR TREE, INC.	IR	Dennis gage to Lake Granbury	500
SUN CITY GEORGETOWN	IR	Lake Granger	15
TEMPLE, CITY OF	MU	Lake Belton Dam to Leon Rv nr Belton	18,500
TEMPLE, CITY OF	MU	Lake Belton Dam to Leon Rv nr Belton	2,500

BRA Contract Name	Use Type	Diversion Location	Annual Amount (acft)
TEMPLE, CITY OF	MU	Lake Belton Dam to Leon Rv nr Belton	9,453
TEXAS MUNICIPAL POWER AGENCY	IN	Easterly gage to Brazos Rv/Navasota Rv confluence	3,600
TEXAS PARKS & WILDLIFE DEPT.	IN	Possum Kingdom Lake	1,200
THE GROVE WATER SUPPLY CORP.	MU	Lake Belton	400
TXU ELECTRIC COMPANY	IN	Lake Limestone	16,026
TXU ELECTRIC COMPANY	IN	Lake Limestone	8,974
TXU ELECTRIC COMPANY	IN	Possum Kingdom Lake	14,000
TXU ELECTRIC COMPANY	IN	Lake Granbury	40,000
TXU ELECTRIC COMPANY	IN	Possum Kingdom Lake	43,447
UPPER LEON RIVER MUNICIPAL	MU	Lake Proctor	2,890
UPPER LEON RIVER MWD	MU	Lake Proctor	3,315
UPPER LEON RIVER MWD	MU	Lake Proctor	232
VULCAN CONST. MATERIALS, L.P.	MI	Palo Pinto gage to Dennis gage	1,000
WELLBORN SPECIAL UTILITY DIST.	MU	Easterly gage to Brazos Rv/Navasota Rv confluence	4,000
WESTERN COMPANY OF TEXAS, INC	MI	Lake Granbury Dam to Glen Rose gage	1,000
WHITE BLUFF PROPERTY OWNERS	IR	Lake Whitney	1,000
WHITNEY, CITY OF	MU	Lake Whitney	750
WILDFLOWER COUNTRY CLUB	IR	Leon Rv nr Belton to Little Rv gage	200

MU – Municipal Use; IR – Irrigation Use; IN – Industrial Use; MI – Mining Use; OT – Other; SUB – Subordination Agreement

These agreements generally do not reserve water from a particular source for a customer but rather obligate the BRA to make available at the customer's diversion

point the quantity of water specified in the contract under the terms and conditions of the contract.

B. Short-Term Contracts

The BRA sells interruptible water on a short-term basis in accordance with BRA policy. The amount of interruptible water available is determined on a yearly basis and comes from various temporarily available sources, such as unused water from prior years remaining in storage and water in storage capacity reserved for future sediment accumulation. Any water used to supply short-term contracts from the System Operation Permit is subject to the accounting requirements described in Section V of this WMP and the environmental flow requirements in Section IV.D, and may be made available on a different basis than the short-term contracts in existence as of the effective date of this WMP.

C. Water Delivery and Customer Location

The BRA supplies water to its long-term and short-term customers from the perimeters of the System reservoirs (lakeside customers) and from the streams downstream of those reservoirs (downstream customers). The BRA's lakeside customers may divert water from the reservoirs as needed under the terms of their contracts and report their water use to the BRA the following month. The BRA's downstream customers request a delivery of water before diverting water under their BRA contracts. The BRA considers the time of travel and estimated losses from the reservoir to the diversion point downstream when making releases for downstream customers. If water is available for diversion under the System Operation Permit or the Excess Flows Permit, the BRA may allow the customer to divert water under the System Operation Permit or Excess Flows Permit without releasing water from storage. The BRA shall account for the diversions under its water rights in accordance with Section V of this WMP.

D. Future Contracts

When BRA enters into additional water supply contracts supplying water appropriated by the System Operation Permit, it shall file those contracts pursuant to Section 297.102

of Title 30 of the Texas Administrative Code, thus authorizing the new diversion points. So long as diversions made under the System Operation Permit at any new diversion point comply with the reach maximum aggregate diversion rate limitations in Section IV.D.4.b of this WMP (Table 4.6), no amendment of the System Operation Permit or the WMP will be required to add such new diversion points.

Section IV

Water Supply Operations

A. Water Supply System Overview

1. Reservoir Operations

The BRA will continue to operate its System reservoirs in accordance with the legal requirements, terms and conditions of: (a) the BRA's water rights (summarized in Section II, above), including the System Operation Permit; (b) the BRA's existing contractual agreements, including but not limited to agreements with the USACE; and (c) the BRA's water supply contracts and subordination agreements (listed in Table 3.1, above), except to the extent that any of the legal requirements, terms or conditions of any of the foregoing are expressly modified or superseded by this WMP.

2. Legal Constraints

The BRA will continue to operate its System reservoirs in accordance with the following legal requirements, terms and conditions affecting BRA reservoir releases:

- Drawdown limits outlined in BRA contracts with USACE;
- Drawdown limits included in valid, existing BRA contracts with wholesale water customers;
- Terms and conditions of BRA's reservoir water rights and the System Operation Permit;
- Provisions of the System Order, as supplemented by this WMP;
- Provisions of BRA's Excess Flows Permit, COA No. 12-5166, as amended; and
- Interbasin transfers authorized under BRA's various water rights, including the System Operation Permit, and related contractual arrangements.

3. Operational Considerations

When downstream customer water needs must be met by a release from an upstream reservoir, undedicated releases from BRA System reservoirs will be used first to meet

the downstream water supply demand. Such undedicated releases may result from a variety of conditions, including reservoir leakage, voluntary minimum flow releases, excess water supply releases, flood releases, and releases for hydropower generation (Lake Whitney). Once dedicated for meeting a downstream customer's water needs, these releases will be assigned to BRA's water rights and the customer's contract.

The BRA makes reservoir release decisions to provide for beneficial use of the water downstream while also considering local water supply needs around the System reservoir(s), environmental needs, and recreational uses. BRA's determination of the timing and amount of the release is made based on the reservoir location and the location of the customer. Releases for downstream water supply are coordinated with the appropriate project site, externally or internally, depending on whether the reservoir is owned by the BRA or USACE. The BRA may release water from one or more System reservoirs, at its discretion, to meet a water supply need from a downstream customer.

As authorized under the System Operation Permit and BRA's existing reservoir water rights, the BRA uses the bed and banks of the Brazos River and its tributaries to deliver stored water to downstream customers. The BRA's reservoir releases to meet such demands will include sufficient water for the requested downstream diversion, plus the amount needed to cover the estimated channel losses from the reservoir location to the diversion location, based on the following estimated incremental travel time and loss values for each stream segment in the basin:

Table 4.1 Summary of Estimated Channel Losses and Travel Times for Average Conditions

Reach	Incremental Travel Time (days)	Incremental Losses (%)	Incremental Distance (river miles)
Possum Kingdom to Palo Pinto gage	0.51	0.52	20.2
Palo Pinto gage to Dennis gage	1.96	1.98	77.5
Dennis gage to Lake Granbury	1.53	1.20	47.3
Lake Granbury to Glen Rose gage	1.70	0.84	31.2
Glen Rose gage to Lake Whitney	4.30	1.86	68.9

Reach	Incremental Travel Time (days)	Incremental Losses (%)	Incremental Distance (river miles)
Lake Whitney to Aquilla Creek/Brazos confluence	0.56	0.45	25.3
Lake Aquilla to Aquilla Creek gage	0.12	0.11	5.0
Aquilla Creek gage to Aquilla Creek/Brazos confluence	0.44	0.39	18.2
Aquilla Creek/ Brazos confluence to Waco gage	0.44	0.30	16.9
Waco gage to Highbank gage	1.39	0.94	53.6
Lake Proctor to Leon Rv at Gatesville gage	4.27	48.50	129.1
Leon Rv at Gatesville to Lake Belton	2.73	2.60	82.3
Lake Belton to Leon Rv nr Belton gage	0.19	0.16	3.5
Leon Rv nr Belton gage to Little River gage	0.91	0.89	19.1
Lake Stillhouse Hollow Dam to Lampasas Rv nr Belton gage	0.14	0.05	3.0
Lampasas Rv nr Belton gage to Little River gage	0.95	0.53	18.9
Little River to Little/San Gabriel confluence	1.72	2.39	51.5
Lake Georgetown to N San Gabriel gage	0.03	0.02	1.0
N San Gabriel gage to Lake Granger	0.97	0.78	35.5
Lake Granger to Laneport Gage	0.13	0.13	5.0
Laneport Gage to Little/San Gabriel confluence	0.68	0.67	26.2
Little/San Gabriel confluence to Little Rv at Cameron gage	0.36	0.50	10.7
Cameron gage to Brazos/Little confluence	1.12	1.56	33.6
Highbank gage to Brazos/Little confluence	0.90	0.61	34.6
Brazos/Little confluence to Bryan gage	0.80	0.86	30.9
Bryan gage to Brazos/Yegua confluence	0.99	1.06	38.1

Reach	Incremental Travel Time (days)	Incremental Losses (%)	Incremental Distance (river miles)
Lake Somerville to Yegua gage	0.07	0.07	1.3
Yegua gage to Brazos/Yegua confluence	1.01	1.03	18.8
Brazos/Yegua confluence to Brazos/Navasota confluence	0.43	0.46	16.6
Lake Limestone to Easterly gage	1.21	0.88	25.8
Easterly gage to Brazos/Navasota confluence	5.31	3.62	105.7
Brazos/Navasota confluence to Hempstead gage	0.87	0.93	33.4
Hempstead gage to Richmond gage	2.62	2.82	101.0
Richmond gage to Rosharon gage	0.92	0.98	35.3
Rosharon gage to Gulf of Mexico	1.47	1.58	56.7

These estimated average incremental channel losses are consistent with the TCEQ's Brazos WAM. In the event actual channel losses are determined to vary from these values during a downstream release, the BRA, in coordination with its customer and the Brazos Basin Watermaster, may adjust the release as necessary to deliver the needed rate of flow at the customer diversion location. Unless expressly stated otherwise in a customer's water supply contract, the total amount of water released from the reservoir will be charged against the customer's contract.

B. System Operation Permit

The WMP Technical Report, Section 4.3.1, includes use of the System Operation Permit in coordination with the BRA's existing water rights to supply demands under alternative development scenarios, taking into account major factors that will impact operations, and assuming currently permitted return flows. (This assumption is different than the new appropriation modeling discussed in Section 2 of this WMP. In those models, historical monthly minimum return flows from 2007 to 2011 were used.) These scenarios are:

- 2025 Conditions, without the CPNPP expansion;
- 2025 Conditions, with the CPNPP expansion;

- 2060 Conditions, without the CPNPP expansion; and
- 2060 Conditions, with the CPNPP expansion.

Depending upon the course of future development, the BRA will be able to operate its existing reservoirs and water rights, and the System Operation Permit, generally as described in the most appropriate of the foregoing operating scenarios.

C. System Order Modifications

The System Order and the BRA's existing reservoir water rights require that when a reservoir drops below 30% capacity it not be operated as part of the System until all other System reservoirs have also dropped below 30% capacity (the "30% requirement"). In such event, no releases could be made from the reservoir except for local needs so long as any other System reservoir that could meet System needs remained more than 30% full. Lake Proctor, Lake Aquilla, and Lake Georgetown are operated primarily to meet local demands and are not generally operated as part of the System. The 30% requirement is counterproductive if these reservoirs are required to be drawn below 30% capacity in order to allow System use of other reservoirs. Therefore, other BRA System reservoirs are authorized to operate as part of the System regardless of the levels of Lake Proctor, Lake Aquilla, and Lake Georgetown.

Because of the BRA's relatively small amount of storage capacity in Lake Whitney and the hydropower operations occurring independent of the BRA's water supply operations, application of the 30% requirement does not accomplish its intended purpose (reserving supply for local needs) in the case of Lake Whitney. Therefore, other BRA System reservoirs are not required to be drawn down to 30% storage prior to BRA using its full authorized storage capacity in Lake Whitney. BRA is authorized to use the full amount of its authorized storage in Lake Whitney regardless of the levels of any other System reservoirs.

As directed, BRA filed applications to amend its existing water rights in conformity with the modifications of the 30% requirement set forth above, and those applications have been approved. Such amendments shall be considered minor conforming amendments to those water rights.

D. Environmental Flows Under the System Operation Permit

The BRA may divert run-of-river flows and impound water under the System Operation Permit when specified conditions are satisfied at gaged locations within the Brazos River basin.

1. Operating Guidelines to Manage Impacts on Reservoir Fisheries from Reservoir Level Fluctuations

In order to manage the frequency and magnitude of System reservoir level fluctuations to avoid or minimize impacts on reservoir fisheries, the BRA will utilize the following operating guideline:

If possible, no reservoir should be maintained continuously at an elevation below the threshold shown in Table 4.2 for more than three consecutive years. If the running monthly annual average elevation falls below the threshold for three consecutive years, consideration should be given to excluding the reservoir from downstream releases until such time as the running monthly annual average reservoir elevation meets or exceeds the threshold elevation for the duration of one year.

Table 4.2 Threshold Elevation by System Reservoir

Reservoir	TOC* (ft-msl)	Threshold Elevation (ft-msl)	Drawdown from TOC (ft)
Aquilla	538	536	-2
Belton	594	578	-16
Georgetown	791	787	-4
Granbury	693	690	-3
Granger	504	504	0
Limestone	363	358	-5
Possum Kingdom	999	995	-4
Proctor	1162	1158	-4
Somerville	238	236	-2
Stillhouse Hollow	622	610	-12
Whitney	533	N/A	N/A

Reservoir	TOC* (ft-msl)	Threshold Elevation (ft-msl)	Drawdown from TOC (ft)
* TOC – Top of conservation			

This operating guideline is subject to temporary suspension if necessary for water supply purposes. Due to BRA's limited portion of the total water supply capacity in Lake Whitney, that reservoir is excluded from the operating guideline.

2. Environmental Flows Special Conditions

a. Measurement Point Locations and Flow Levels

The BRA will comply with environmental flow special conditions for subsistence flows, base flows, and high flow pulses (HFPs) in this WMP, for each of the applicable WMP measurement point locations at USGS gage locations throughout the basin. These environmental flow conditions are set out in Tables 4.3A through 4.3L below. The measurement points applicable to each reach are set out in Section IV.D.2.b and Table 4.4 below. The environmental flow conditions related to subsistence flows are applicable at all times at these measurement point locations.

For the purposes of environmental flow conditions for base flows and HFPs, the seasons are defined as:

Winter - November through February
Spring - March through June
Summer - July through October

Within each season, base flows and HFPs vary based on the hydrologic condition (Wet, Dry, or Average). Hydrologic condition is a trigger that determines the applicable base flow or HFP requirements at each measurement point, and is determined using the Palmer Hydrological Drought Index (PHDI) according to criteria set forth in Section 298.450 of Title 30 of the Texas Administrative Code (see WMP Technical Report Section 4.4.2.1).

The BRA shall not divert or store water pursuant to the System Operation Permit when instantaneous flow values at the reach measurement point are below applicable base and subsistence flow conditions. The BRA shall not divert or store water pursuant to the System Operation Permit if such storage or diversion would prevent meeting a seasonal schedule of individual HFPs at the applicable measurement point.

Table 4.3A - United States Geological Survey Gage 08088000, Brazos River near South Bend (30 TAC § 298.480(a)(6))						
Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	1 cfs	Dry	36 cfs	N/A	N/A	N/A
		Average	73 cfs			
		Wet	120 cfs			
Spring	1 cfs	Dry	29 cfs	1 per season Trigger: 1,260 cfs Volume: 7,280 af Duration: 10 days	2 per season Trigger: 1,260 cfs Volume: 7,280 af Duration: 10 days	1 per season Trigger: 2,480 cfs Volume: 15,700 af Duration: 13 days
		Average	60 cfs			
		Wet	100 cfs			
Summer	1 cfs	Dry	16 cfs	1 per season Trigger: 580 cfs Volume: 3,140 af Duration: 8 days	2 per season Trigger: 580 cfs Volume: 3,140 af Duration: 8 days	1 per season Trigger: 1,180 cfs Volume: 7,050 af Duration: 11 days
		Average	46 cfs			
		Wet	95 cfs			
cfs = cubic feet per second; af = acre-feet; N/A = not applicable						

Table 4.3B - United States Geological Survey Gage 08089000, Brazos River near Palo Pinto (30 TAC §298.480(a)(7))

Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	17 cfs	Dry	40 cfs	2 per season Trigger: 850 cfs Volume: 3,690 af Duration: 5 days	4 per season Trigger: 850 cfs Volume: 3,690 af Duration: 5 days	4 per season Trigger: 850 cfs Volume: 3,690 af Duration: 5 days
		Average	61 cfs		2 per season Trigger: 1,390 cfs Volume: 7,180 af Duration: 7 days	3 per season Trigger: 1,390 cfs Volume: 7,180 af Duration: 7 days
		Wet	100 cfs			
Spring	17 cfs	Dry	39 cfs	2 per season Trigger: 1,400 cfs Volume: 6,600 af Duration: 6 days	4 per season Trigger: 1,400 cfs Volume: 6,600 af Duration: 6 days	4 per season Trigger: 1,400 cfs Volume: 6,600 af Duration: 6 days
		Average	75 cfs		2 per season Trigger: 3,370 cfs Volume: 20,200 af Duration: 10 days	3 per season Trigger: 3,370 cfs Volume: 20,200 af Duration: 10 days
		Wet	120 cfs			
Summer	17 cfs	Dry	40 cfs	2 per season Trigger: 1,230 cfs Volume: 5,920 af Duration: 6 days	4 per season Trigger: 1,230 cfs Volume: 5,920 af Duration: 6 days	4 per season Trigger: 1,230 cfs Volume: 5,920 af Duration: 6 days
		Average	72 cfs		2 per season Trigger: 2,260 cfs Volume: 13,000 af Duration: 9 days	3 per season Trigger: 2,260 cfs Volume: 13,000 af Duration: 9 days
		Wet	120 cfs			

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

Table 4.3C - United States Geological Survey Gage 08089100, Brazos River near Glen Rose (30 TAC §298.480(a)(8))

Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	16 cfs	Dry	42 cfs	2 per season Trigger: 930 cfs Volume: 5,400 af Duration: 8 days	4 per season Trigger: 930 cfs Volume: 5,400 af Duration: 8 days	4 per season Trigger: 930 cfs Volume: 5,400 af Duration: 8 days
		Average	77 cfs		2 per season Trigger: 1,700 cfs Volume: 10,800 af Duration: 10 days	3 per season Trigger: 1,700 cfs Volume: 10,800 af Duration: 10 days
		Wet	160 cfs		2 per season Trigger: 2,350 cfs Volume: 14,300 af Duration: 10 days	3 per season Trigger: 6,480 cfs Volume: 46,700 af Duration: 14 days
Spring	16 cfs	Dry	47 cfs	2 per season Trigger: 2,350 cfs Volume: 14,300 af Duration: 10 days	4 per season Trigger: 2,350 cfs Volume: 14,300 af Duration: 10 days	4 per season Trigger: 2,350 cfs Volume: 14,300 af Duration: 10 days
		Average	92 cfs		2 per season Trigger: 6,480 cfs Volume: 46,700 af Duration: 14 days	3 per season Trigger: 6,480 cfs Volume: 46,700 af Duration: 14 days
		Wet	170 cfs		2 per season Trigger: 1,320 cfs Volume: 7,830 af Duration: 8 days	3 per season Trigger: 3,090 cfs Volume: 21,200 af Duration: 12 days
Summer	16 cfs	Dry	37 cfs	2 per season Trigger: 1,320 cfs Volume: 7,830 af Duration: 8 days	4 per season Trigger: 1,320 cfs Volume: 7,830 af Duration: 8 days	4 per season Trigger: 1,320 cfs Volume: 7,830 af Duration: 8 days
		Average	70 cfs		2 per season Trigger: 3,090 cfs Volume: 21,200 af Duration: 12 days	3 per season Trigger: 3,090 cfs Volume: 21,200 af Duration: 12 days
		Wet	160 cfs		2 per season Trigger: 3,090 cfs Volume: 21,200 af Duration: 12 days	3 per season Trigger: 3,090 cfs Volume: 21,200 af Duration: 12 days

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

Table 4.3D - United States Geological Survey Gage 08096500, Brazos River near Waco (30 TAC §298.480(a)(10))

Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	56 cfs	Dry	120 cfs	1 per season Trigger: 2,320 cfs Volume: 12,400 af Duration: 7 days	3 per season Trigger: 2,320 cfs Volume: 12,400 af Duration: 7 days	2 per season Trigger: 4,180 cfs Volume: 25,700 af Duration: 9 days
		Average	210 cfs			
		Wet	480 cfs			
Spring	56 cfs	Dry	150 cfs	1 per season Trigger: 5,330 cfs Volume: 32,700 af Duration: 10 days	3 per season Trigger: 5,330 cfs Volume: 32,700 af Duration: 10 days	2 per season Trigger: 13,600 cfs Volume: 102,000 af Duration: 14 days
		Average	270 cfs			
		Wet	690 cfs			
Summer	56 cfs	Dry	140 cfs	1 per season Trigger: 1,980 cfs Volume: 10,500 af Duration: 7 days	3 per season Trigger: 1,980 cfs Volume: 10,500 af Duration: 7 days	2 per season Trigger: 4,160 cfs Volume: 26,400 af Duration: 10 days
		Average	250 cfs			
		Wet	590 cfs			
cfs = cubic feet per second; af = acre-feet; N/A = not applicable						

Table 4.3E - United States Geological Survey Gage 08100500, Leon River near Gatesville (30 TAC §298.480(a)(11))

Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	1cfs	Dry	9 cfs	N/A	N/A	2 per season Trigger: 100 cfs Volume: 540 af Duration: 6 days
		Average	20 cfs			
		Wet	52 cfs			
Spring	1 cfs	Dry	10 cfs	1 per season Trigger: 340 cfs Volume: 1,910 af Duration: 10 days	3 per season Trigger: 340 cfs Volume: 1,910 af Duration: 10 days	2 per season Trigger: 630 cfs Volume: 4,050 af Duration: 13 days
		Average	24 cfs			
		Wet	54 cfs			
Summer	1 cfs	Dry	4 cfs	1 per season Trigger: 58 cfs Volume: 220 af Duration: 4 days	3 per season Trigger: 58 cfs Volume: 220 af Duration: 4 days	2 per season Trigger: 140 cfs Volume: 600 af Duration: 6 days
		Average	12 cfs			
		Wet	27 cfs			
cfs = cubic feet per second; af = acre-feet; N/A = not applicable						

Table 4.3F - United States Geological Survey Gage 08104500, Little River near Little River (30 TAC §298.480(a)(13))

Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	55 cfs	Dry	82 cfs	1 per season Trigger: 520 cfs Volume: 2,350 af Duration: 5 days	3 per season Trigger: 520 cfs Volume: 2,350 af Duration: 5 days	2 per season Trigger: 1,600 cfs Volume: 11,800 af Duration: 11 days
		Average	110 cfs			
		Wet	190 cfs			
Spring	55 cfs	Dry	95 cfs	1 per season Trigger: 1,420 cfs Volume: 9,760 af Duration: 10 days	3 per season Trigger: 1,420 cfs Volume: 9,760 af Duration: 10 days	2 per season Trigger: 3,290 cfs Volume: 32,200 af Duration: 17 days
		Average	150 cfs			
		Wet	340 cfs			
Summer	55 cfs	Dry	84 cfs	1 per season Trigger: 430 cfs Volume: 1,560 af Duration: 4 days	3 per season Trigger: 430 cfs Volume: 1,560 af Duration: 4 days	2 per season Trigger: 1,060 cfs Volume: 5,890 af Duration: 8 days
		Average	120 cfs			
		Wet	200 cfs			
cfs = cubic feet per second; af = acre-feet; N/A = not applicable						

Table 4.3G - United States Geological Survey Gage 08106500, Little River near Cameron (30 TAC §298.480(a)(14))

Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	32 cfs	Dry	110 cfs	1 per season Trigger: 1,080 cfs Volume: 6,680 af Duration: 8 days	3 per season Trigger: 1,080 cfs Volume: 6,680 af Duration: 8 days	2 per season Trigger: 2,140 cfs Volume: 14,900 af Duration: 10 days
		Average	190 cfs			
		Wet	460 cfs			
Spring	32 cfs	Dry	140 cfs	1 per season Trigger: 3,200 cfs Volume: 23,900 af Duration: 12 days	3 per season Trigger: 3,200 cfs Volume: 23,900 af Duration: 12 days	2 per season Trigger: 4,790 cfs Volume: 38,400 af Duration: 14 days
		Average	310 cfs			
		Wet	760 cfs			
Summer	32 cfs	Dry	97 cfs	1 per season Trigger: 560 cfs Volume: 2,860 af Duration: 6 days	3 per season Trigger: 560 cfs Volume: 2,860 af Duration: 6 days	2 per season Trigger: 990 cfs Volume: 5,550 af Duration: 8 days
		Average	160 cfs			
		Wet	330 cfs			
cfs = cubic feet per second; af = acre-feet; N/A = not applicable						

Table 4.3H - United States Geological Survey Gage 08108700, Brazos River at SH21 near Bryan (30 TAC §298.480(a)(15))

Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	300 cfs	Dry	540 cfs	1 per season Trigger: 3,230 cfs Volume: 21,100 af Duration: 7 days	3 per season Trigger: 3,320 cfs Volume: 21,100 af Duration: 7 days	2 per season Trigger: 5,570 cfs Volume: 41,900 af Duration: 10 days
		Average	860 cfs			
		Wet	1,760 cfs			
Spring	300 cfs	Dry	710 cfs	1 per season Trigger: 6,050 cfs Volume: 49,000 af Duration: 11 days	3 per season Trigger: 6,050 cfs Volume: 49,000 af Duration: 11 days	2 per season Trigger: 10,400 cfs Volume: 97,000 af Duration: 14 days
		Average	1,260 cfs			
		Wet	2,460 cfs			
Summer	300 cfs	Dry	630 cfs	1 per season Trigger: 2,060 cfs Volume: 12,700 af Duration: 7 days	3 per season Trigger: 2,060 cfs Volume: 12,700 af Duration: 7 days	2 per season Trigger: 2,990 cfs Volume: 20,100 af Duration: 8 days
		Average	920 cfs			
		Wet	1,470 cfs			
cfs = cubic feet per second; af = acre-feet; N/A = not applicable						

Table 4.3I - United States Geological Survey Gage 08110500, Navasota River near Easterly (30 TAC §298.480(a)(16))

Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	1 cfs	Dry	9 cfs	1 per season Trigger: 260 cfs Volume: 1,610 af Duration: 9 days	3 per season Trigger: 260 cfs Volume: 1,610 af Duration: 9 days	2 per season Trigger: 800 cfs Volume: 5,440 af Duration: 12 days
		Average	14 cfs			
		Wet	23 cfs			
Spring	1 cfs	Dry	10 cfs	1 per season Trigger: 720 cfs Volume: 4,590 af Duration: 11 days	3 per season Trigger: 720 cfs Volume: 4,590 af Duration: 11 days	2 per season Trigger: 1,340 cfs Volume: 8,990 af Duration: 13 days
		Average	19 cfs			
		Wet	29 cfs			
Summer	1 cfs	Dry	3 cfs	N/A	N/A	2 per season Trigger: 49 cfs Volume: 220 af Duration: 5 days
		Average	8 cfs			
		Wet	16 cfs			

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

Table 4.3J - United States Geological Survey Gage 08111500, Brazos River near Hempstead (30 TAC §298.480(a)(17))

Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	510 cfs	Dry	920 cfs	1 per season Trigger: 5,720 cfs Volume: 49,800 af Duration: 10 days	3 per season Trigger: 5,720 cfs Volume: 49,800 af Duration: 10 days	2 per season Trigger: 11,200 cfs Volume: 125,000 af Duration: 15 days
		Average	1,440 cfs			
		Wet	2,890 cfs			
Spring	510 cfs	Dry	1,130 cfs	1 per season Trigger: 8,530 cfs Volume: 85,000 af Duration: 13 days	3 per season Trigger: 8,530 cfs Volume: 85,000 af Duration: 13 days	2 per season Trigger: 16,800 cfs Volume: 219,000 af Duration: 19 days
		Average	1,900 cfs			
		Wet	3,440 cfs			
Summer	510 cfs	Dry	950 cfs	1 per season Trigger: 2,620 cfs Volume: 17,000 af Duration: 7 days	3 per season Trigger: 2,620 cfs Volume: 17,000 af Duration: 7 days	2 per season Trigger: 5,090 cfs Volume: 40,900 af Duration: 9 days
		Average	1,330 cfs			
		Wet	2,050 cfs			
cfs = cubic feet per second; af = acre-feet; N/A = not applicable						

Table 4.3K - United States Geological Survey Gage 08114000, Brazos River near Richmond (30 TAC §298.480(a)(18))

Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	550 cfs	Dry	990 cfs	1 per season Trigger: 6,410 cfs Volume: 60,600 af Duration: 11 days	3 per season Trigger: 6,410 cfs Volume: 60,600 af Duration: 11 days	2 per season Trigger: 12,400 cfs Volume: 150,000 af Duration: 16 days
		Average	1,650 cfs			
		Wet	3,310 cfs			
Spring	550 cfs	Dry	1,190 cfs	1 per season Trigger: 8,930 cfs Volume: 94,000 af Duration: 13 days	3 per season Trigger: 8,930 cfs Volume: 94,000 af Duration: 13 days	2 per season Trigger: 16,300 cfs Volume: 215,000 af Duration: 19 days
		Average	2,140 cfs			
		Wet	3,980 cfs			
Summer	550 cfs	Dry	930 cfs	1 per season Trigger: 2,460 cfs Volume: 16,400 af Duration: 6 days	3 per season Trigger: 2,460 cfs Volume: 16,400 af Duration: 6 days	2 per season Trigger: 5,430 cfs Volume: 46,300 af Duration: 10 days
		Average	1,330 cfs			
		Wet	2,190 cfs			
cfs = cubic feet per second; af = acre-feet; N/A = not applicable						

Table 4.3L - United States Geological Survey Gage 08116650, Brazos River near Rosharon (30 TAC §298.480(a)(19))						
Season	Sub-sistence	Hydrologic Condition	Base	Dry Condition Seasonal Pulse	Average Condition Seasonal Pulse	Wet Condition Seasonal Pulse
Winter	430 cfs	Dry	1,140 cfs	1 per season Trigger: 9,090 cfs Volume: 94,700 af Duration: 12 days	3 per season Trigger: 9,090 cfs Volume: 94,700 af Duration: 12 days	2 per season Trigger: 13,600 cfs Volume: 168,000 af Duration: 16 days
		Average	2,090 cfs			
		Wet	4,700 cfs			
Spring	430 cfs	Dry	1,250 cfs	1 per season Trigger: 6,580 cfs Volume: 58,500 af Duration: 10 days	3 per season Trigger: 6,580 cfs Volume: 58,500 af Duration: 10 days	2 per season Trigger: 14,200 cfs Volume: 184,000 af Duration: 18 days
		Average	2,570 cfs			
		Wet	4,740 cfs			
Summer	430 cfs	Dry	930 cfs	1 per season Trigger: 2,490 cfs Volume: 14,900 af Duration: 6 days	3 per season Trigger: 2,490 cfs Volume: 14,900 af Duration: 6 days	2 per season Trigger: 4,980 cfs Volume: 39,100 af Duration: 9 days
		Average	1,420 cfs			
		Wet	2,630 cfs			
cfs = cubic feet per second; af = acre-feet; N/A = not applicable						

b. Applicable Measurement Points for Reaches

Environmental flow conditions applicable to a diversion are determined based upon the reach in which the diversion is located. The applicable measurement point for each reach within the WMP area is identified in Table 4.4. The Segment ID references are provided for convenience in relating reaches, applicable measurement points and maximum diversion rates (see Table 4.6 below).

For diversions upstream of the applicable measurement point gage, the daily maximum allowable System Operation Permit run-of-river diversion amount will be limited such that the daily flow at the measurement point gage is not reduced below the applicable environmental flow standard.

For diversions located downstream of a measurement point, the environmental flow requirement will be calculated by adding the aggregated downstream System Operation Permit diversion rate to the applicable environmental flow standard at the corresponding measurement point gage.

The maximum allowable System Operation Permit diversion amount within a reach applies to the aggregate of all diversions in the reach. An allowable System Operation Permit diversion, whether upstream or downstream of the reach's applicable measurement point, will not reduce flow below the environmental flow standard at a point immediately below BRA's point of diversion and additionally will not exceed provisions set forth in Section IV.D.4.b below.

Lakeside diversion of inflows under the System Operation Permit occurring within Possum Kingdom Lake or within Lake Whitney will be according to the applicable SB3 measurement point that lies upstream of each respective lake.

Table 4.4 WMP Reaches with Applicable SB3 Measurement Points

Reach	Applicable SB3 Measurement Point (MP)	Segment ID*	SB3 Geographic Area
Possum Kingdom Lake*	For Diversions within Possum Kingdom - Brazos River near South Bend; For Flows passing through Possum Kingdom Lake – Brazos River near Palo Pinto	Possum Kingdom Lake	Upper Basin
Possum Kingdom dam to Palo Pinto gage	Brazos River near Palo Pinto	A	Middle Basin
Palo Pinto gage to Dennis gage*	Brazos River near Palo Pinto	A	Middle Basin
Dennis gage to Lake Granbury dam*	For Diversions above and within Lake Granbury - Brazos River near Palo Pinto; For Flows passing through Lake Granbury – Brazos River near Glen Rose	A, Lake Granbury	Middle Basin
Lake Granbury dam to Glen Rose gage	Brazos River near Glen Rose	B	Middle Basin
Glen Rose gage to Lake Whitney dam*	For Diversions above and within Lake Whitney - Brazos River near Glen Rose; For Flows passing through Lake Whitney – Brazos River near Waco	B, Lake Whitney	Middle Basin
Lake Whitney dam to Aquilla Creek/Brazos confluence	Brazos River near Waco	C	Lower Basin
Lake Aquilla	Brazos River near Waco	AA	Lower Basin
Lake Aquilla dam to Aquilla Creek gage	Brazos River near Waco	Lake Aquilla	Lower Basin
Aquilla Creek gage to Aquilla Creek/Brazos confluence	Brazos River near Waco	AA	Lower Basin
Aquilla Creek/ Brazos confluence to Highbank gage*	Brazos River near Waco	C	Lower Basin

Table 4.4 WMP Reaches with Applicable SB3 Measurement Points

Reach	Applicable SB3 Measurement Point (MP)	Segment ID⁺	SB3 Geographic Area
Lake Proctor	Leon River at Gatesville	Lake Proctor	Lower Basin
Lake Proctor dam to Leon Rv at Gatesville gage	Leon River at Gatesville	LA	Lower Basin
Leon Rv at Gatesville to Lake Belton dam*	For Diversions above and within Belton - Leon River at Gatesville; For Flows passing through Lake Belton – Little River near Little River	Lake Belton	Lower Basin
Lake Belton dam to Leon Rv nr Belton gage	Little River near Little River	LR	Lower Basin
Leon Rv nr Belton gage to Little River gage	Little River near Little River	LR	Lower Basin
Lake Stillhouse Hollow	Little River near Little River	Lake Stillhouse Hollow	Lower Basin
Lake Stillhouse Hollow Dam to Lampasas Rv nr Belton gage	Little River near Little River	LP	Lower Basin
Lampasas Rv nr Belton gage to Little River gage	Little River near Little River	LP	Lower Basin
Little River to Little/San Gabriel confluence	Little River near Cameron	LC	Lower Basin
Lake Georgetown	Little River near Cameron	Lake Georgetown	Lower Basin
Lake Georgetown dam to N San Gabriel gage	Little River near Cameron	GA	Lower Basin
N San Gabriel gage to Lake Granger dam	Little River near Cameron	Lake Granger	Lower Basin
Lake Granger dam to Laneport Gage	Little River near Cameron	GC	Lower Basin
Laneport Gage to Little/San Gabriel confluence	Little River near Cameron	GC	Lower Basin
Little/San Gabriel confluence to Little Rv at Cameron gage	Little River near Cameron	LC	Lower Basin
Cameron gage to Brazos/Little confluence*	Little River near Cameron	LD	Lower Basin
Highbank gage to Brazos/Little confluence	Brazos River at SH21 near Bryan	D	Lower Basin
Brazos/Little confluence to Bryan gage	Brazos River at SH21 near Bryan	D	Lower Basin
Bryan gage to Brazos/Yegua confluence	Brazos River near Hempstead	E	Lower Basin
Lake Somerville	Brazos River near Hempstead	Lake Somerville	Lower Basin
Lake Somerville dam to Yegua gage	Brazos River near Hempstead	YA	Lower Basin
Yegua gage to Brazos/Yegua confluence	Brazos River near Hempstead	YB	Lower Basin

Table 4.4 WMP Reaches with Applicable SB3 Measurement Points			
Reach	Applicable SB3 Measurement Point (MP)	Segment ID ⁺	SB3 Geographic Area
Brazos/Yegua confluence to Brazos/Navasota confluence	Brazos River near Hempstead	E	Lower Basin
Lake Limestone	Navasota near Easterly	Lake Limestone	Lower Basin
Lake Limestone dam to Easterly gage	Navasota near Easterly	NA	Lower Basin
Easterly gage to Brazos/Navasota confluence*	Navasota near Easterly	NB	Lower Basin
Brazos/Navasota confluence to Hempstead gage	Brazos River near Hempstead	E	Lower Basin
Hempstead gage to Richmond gage	Brazos River near Richmond	F	Lower Basin
Richmond gage to Gulf of Mexico*	Brazos River near Rosharon	G and H	Lower Basin
* - Reach located downstream of applicable measurement point or measurement point is within reach. + - Segments do not include lake reaches			

3. Operational Considerations Related to Environmental Flows

The WMP special conditions related to environmental flows are based upon adopted TCEQ rules for the Brazos basin (TAC Title 30, Chapter 298, Subchapter G (adopted Feb. 12, 2014)), and are applicable at all times at MP locations identified above in Section IV.D.2.a. Storage and diversion under the System Operation Permit is contingent upon satisfying flow criteria for subsistence, base flow and high flow pulse levels at the MP applicable to the storage or diversion location. This WMP defines certain conditions under which the BRA must pass high streamflow events impounded by System reservoirs downstream for environmental needs, subject to applicable HFP requirements. These HFP requirements do not apply when water is being impounded in a reservoir to refill storage that was originally depleted under the reservoir's individual water right or the System Order. The HFP requirements also do not apply to run-of-river diversions under circumstances outlined in the diversion rate trigger levels (DRTLs), addressed in Section IV.D.4.a below. The pulse flow criteria required at each measurement point are identified in Tables 4.3A through 4.3L above.

4. Run-of-River Diversion Rates

a. Diversion Rate Trigger Levels

Diversions at rates below certain thresholds are not required to meet HFP standards, pursuant to Section 298.485 of Title 30 of the Texas Administrative Code. Diversion Rate Trigger Levels (DRTLs) are the thresholds below which HFP criteria do not apply to System Operation Permit run-of-river diversions. These DRTLs are based upon pulse

levels at the MP applicable to each reach (Table 4.5) and are defined as 20% of the pulse trigger flow (Tables 4.3A through 4.3L).

Diversion rate magnitude is determined by calculating the sum of all diversions under the System Operation Permit that occur within reaches having a common applicable MP. The DRTL applies only to diversion of natural flows and Return Flows under the System Operation Permit. It does not apply to contract deliveries of water released from upstream BRA reservoirs for downstream use.

The following matrix of DRTLs (Table 4.5) sets out the environmental flow HFP criteria for the System Operation Permit.

Table 4.5 Diversion Rate Trigger Levels for Measurement Points

Measurement Point	Diversion Rate Trigger Levels (cfs) based upon 20% of pulse trigger at applicable Measurement Point			
	Season	Dry	Average	Wet
Brazos River near Palo Pinto	Winter	170 cfs	170 cfs (4/season) 278 cfs (2/season)	170 cfs (4/season) 278 cfs (3/season)
	Spring	280 cfs	280 cfs (4/season) 674 cfs (2/season)	280 cfs (4/season) 674 cfs (3/season)
	Summer	246 cfs	246 cfs (4/season) 452 cfs (2/season)	246 cfs (4/season) 452 cfs (3/season)
Brazos River near Glen Rose	Winter	186 cfs	186 cfs (4/season) 340 cfs (2/season)	186 cfs (4/season) 340 cfs (3/season)
	Spring	470 cfs	470 cfs (4/season) 1,296 cfs (2/season)	470 cfs (4/season) 1,296 cfs (3/season)
	Summer	264 cfs	264 cfs (4/season) 618 cfs (2/season)	264 cfs (4/season) 618 cfs (3/season)
Brazos River at Waco	Winter	464 cfs	464 cfs	836 cfs
	Spring	1,066 cfs	1,066 cfs	2,720 cfs
	Summer	396 cfs	396 cfs	832 cfs
Leon River at Gatesville	Winter	N/A	N/A	20 cfs
	Spring	68 cfs	68 cfs	126 cfs
	Summer	11.6 cfs	11.6 cfs	28 cfs
Little River near Little River	Winter	104 cfs	104 cfs	320 cfs
	Spring	284 cfs	284 cfs	658 cfs
	Summer	86 cfs	86 cfs	212 cfs
Little River near Cameron	Winter	216 cfs	216 cfs	428 cfs
	Spring	640 cfs	640 cfs	958 cfs
	Summer	112 cfs	112 cfs	198 cfs
Brazos River at SH21 near Bryan	Winter	646 cfs	664 cfs	1,114 cfs
	Spring	1,210 cfs	1,210 cfs	2,080 cfs
	Summer	412 cfs	412 cfs	598 cfs
Navasota River near Easterly	Winter	52 cfs	52 cfs	160 cfs
	Spring	144 cfs	144 cfs	268 cfs
	Summer	N/A	N/A	9.8 cfs
Brazos River near Hempstead	Winter	1,144 cfs	1,144 cfs	2,240 cfs
	Spring	1,706 cfs	1,706 cfs	3,360 cfs
	Summer	524 cfs	524 cfs	1,018 cfs
Brazos River	Winter	1,282 cfs	1,282 cfs	2,480 cfs

near Richmond	Spring	1,786 cfs	1,786 cfs	3,260 cfs
	Summer	492 cfs	492 cfs	1,086 cfs
Brazos River near Rosharon	Winter	1,818 cfs	1,818 cfs	2,720 cfs
	Spring	1,316 cfs	1,316 cfs	2,840 cfs
	Summer	498 cfs	498 cfs	996 cfs
N/A = Not Applicable				

b. Diversion Rates by River Segment

Table 4.6 contains maximum aggregated diversion rate limits that apply to run-of-river diversions under the System Operation Permit downstream of BRA's System reservoirs (but not to lakeside diversions). These limits on maximum aggregated diversion rates will be applied to diversion of System Operation Permit run-of-river water and are irrespective of the diversion limitations associated with HFPs.

Table 4.6 Maximum Aggregated Diversion Rate for River Diversions in Each Segment

Segment ID	Description	Max. Div. Rate (cfs)
A	Possum Kingdom dam to headwaters Lake Granbury	170
B	Lake Granbury dam to headwaters Whitney Lake	186
C + AA	Whitney Lake dam to Brazos River Highbank, and Aquilla Lake dam to confluence with Brazos River	396
D	Brazos River Highbank to Little River to Brazos SH21	412
E	Brazos River Bryan to Hempstead, and Yegua Creek from Lake Somerville dam to confluence with Brazos River	524
F	Brazos River Hempstead to Brazos River Richmond	1000
G + H	Brazos River Richmond to Brazos River Rosharon, and Brazos River Rosharon to the Gulf of Mexico	1980
NA + NB	Lake Limestone dam to Navasota River Easterly, and Navasota River Easterly to confluence with Brazos River	160
LA+LB	Leon River from Proctor Lake dam to headwaters Belton Lake	90
LR + LP	Leon River from Belton Lake dam to Little River Little River, and Lampasas River from Stillhouse Hollow dam to Little River Little River	86
LC + LD + GA + GB + GC	Little River Little River to Little River Cameron to confluence with Brazos River, and North Fork San Gabriel River from Lake Georgetown dam to confluence with San Gabriel River, and San Gabriel River downstream to confluence with Little River	180

5. Annual Environmental Flows Achievement Report

In addition to the required Accounting Plan (see Section V below), an Environmental Flows Achievement Report will be generated by BRA and submitted to TCEQ once per year. By this Annual Environmental Flows Achievement Report, BRA will provide, in a format approved by TCEQ's Executive Director, an assessment of storage and diversions of water under the System Operation Permit and WMP during the previous one-year period, to demonstrate that BRA's operations do not impact achievement of the adopted environmental flow standards.

Section V

Water Rights Accounting and Reporting

A. Overview of the BRA Water Rights Accounting Plan

The BRA's Accounting Plan is the method of accounting for and reporting water use. It covers a calendar year, with a new Accounting Plan to start on January 1st of each year. Entries in the Accounting Plan will be made regularly by BRA staff. The Accounting Plan includes:

- Customer water use, including delivery of water to downstream customers adjusted for travel time and losses;
- System reservoir operations, including inflows, diversions, water supply releases, passage of instream flows, and storage and use of water under the applicable BRA authorizations;
- Diversions made under the new appropriation contained in the System Operation Permit, including use of Return Flows;
- Compliance with environmental flow criteria, set out in Section IV.D.2 of this WMP; and
- Summaries that show use under the various BRA water rights.

The Accounting Plan consists of five Microsoft Excel workbooks and associated documentation. The five workbooks are:

Reference.xlsb	Miscellaneous data used in other workbooks, including historical data, reservoir information, conversion factors, etc.;
IFCalcs.xlsb	Instream flow calculations;

Reservoirs.xlsb	Information on the operation of the eleven existing BRA System reservoirs (Allens Creek not included at this time);
Reaches.xlsb	Tracking of water supply releases and Return Flows;
Summary.xlsb	Summary and water rights reporting.

The Accounting Plan, conformed as required by Ordering Provision 1.g(2) of the Commission's September 16, 2016 Final Order, is incorporated into this Water Management Plan as Exhibit D, and is incorporated herein by reference. In accordance with TCEQ policies and the requirements of the System Operation Permit, the Accounting Plan will be available for public inspection at BRA headquarters in Waco during normal business hours.

The following sections briefly describe the methods used in the Accounting Plan. More detailed information is contained in the Microsoft Excel workbooks that comprise the Accounting Plan.

B. Customer Water Use Accounting

The Accounting Plan includes daily entries for all BRA customer water use during the year. For customers that report water use to BRA on a monthly basis, the total volume used during the month is to be divided by the number of days in the month or converted to daily use by some other method appropriate for that particular water user. Entries may be aggregated for smaller customers with the same type of use that divert water from the same reach or reservoir. Diversions are summed on a monthly basis for annual reporting.

C. Daily Reservoir Accounting

The Accounting Plan includes daily reservoir accounting for all eleven BRA System reservoirs: Possum Kingdom, Granbury, Whitney, Aquilla, Proctor, Belton, Stillhouse Hollow, Georgetown, Granger, Somerville, and Limestone (Table 2.1 above). The daily reservoir accounting calculates inflow, assigns diversions and downstream releases to either inflows or reservoir storage according to the procedures described in Section V.D.6 below, and calculates conditions under which water is being impounded using the System Operation Permit.

D. Appropriation Accounting Plan

The Accounting Plan tracks diversions made from run-of-river flows, reservoir inflows and reservoir storage on a daily basis. It tracks water appropriated under the System Operation Permit that is used to fill reservoir storage.

1. Environmental Flows

Diversion or storage of water under the System Operation Permit cannot occur if base or subsistence flow criteria are not met at the applicable measurement point. Under HFP conditions, diversion or storage under the System Operation Permit may be limited as well, as described in Sections IV.D.2.b through IV.D.4 of this WMP. The environmental flows portion of the Accounting Plan tracks what happened with respect to environmental flow requirements during each annual reporting period.

a. Classification of High Flow Pulses

The Accounting Plan includes calculations that classify HFPs according to the flow, duration and volume of a pulse event. An HFP is initiated when flows are greater than the pulse trigger flow. An HFP is terminated when either the volume amount has passed the applicable measurement point or the duration time has passed since the high flow pulse trigger level was initiated. An HFP flow event that meets either the duration or volume criteria is a Qualifying HFP. BRA staff will enter daily stream gage flows at the WMP measurement points into the Accounting Plan spreadsheets. The

spreadsheet will automatically classify each day as either base flow or an HFP, according to the criteria in Section IV.D.2 above.

b. Diversion and Storage of High Flow Pulses

For diversions from a stream reach, diversion of run-of-river flows (including both natural flows and Return Flows) made under the System Operation Permit are subject to environmental flow requirements. Except as provided by Section IV of this WMP, diversion of run-of-river flows under the System Operation Permit will be curtailed when such diversions would cause flows to drop below the applicable HFP trigger level, or prevent flows from achieving the larger HFP trigger for measurement points with small and large pulses. However, there are several situations in which diversion from a stream reach can occur during a Qualifying HFP without such limits. Section IV.D.4.a above defines conditions where HFP standards do not apply based on diversion rates. Diversions under the System Operation Permit may also occur if the frequency criterion for Qualifying HFP events has been met during the current season. In all cases the applicable base flow criteria still apply. Diversions or storage under the System Operation Permit from inflows into a System reservoir are also subject to the environmental flow requirements in the WMP.

The WMP allows the BRA to temporarily store pulse events. BRA staff will monitor inflows into each System reservoir to determine (a) if storage is occurring under the System Operation Permit, and (b) whether applicable environmental flow conditions are being met. If impounded flows would prevent achievement of a Qualifying HFP at the applicable measurement point and must be released, BRA staff will coordinate the operational release pattern with the USACE in accordance with the USACE water control plan and rule curves for flood regulation. The schedule of releases will be recorded in the Accounting Plan for each reservoir.

2. Return Flow Accounting Plan

To verify assumptions regarding available return flows, the Accounting Plan reports monthly return flows for permitted discharges listed in Exhibit B, Tables 1 through 3

unless there is an existing permit authorizing reuse of those return flows, in which case the flows are not included as available return flows. The total annual amount of return flows for dischargers will be compared to the assumed amounts used in this WMP. If the actual return flows are less than the amount used in modeling by 5% or greater, BRA will revise the models and submit results to TCEQ.

3. Bed and Banks Delivery Plan

The Accounting Plan divides the Brazos River basin from Possum Kingdom Lake to the Gulf of Mexico into the 40 reaches listed in Table 5.1 below. Some reaches are reservoirs, and include the area from the headwaters of the conservation pool of the reservoir to the dam. Other reaches are stream segments bounded by a reservoir, stream gage or confluence. The reach accounting section of the Accounting Plan tracks BRA water supply releases as they travel through these reaches throughout the year, applying corrections for travel times and losses. The reach accounting also tracks the diversion of the water.

Table 5.1 Accounting Plan Diversion Reaches

Reach Name
Possum Kingdom Lake
Possum Kingdom Lake Dam to Palo Pinto gage
Palo Pinto gage to Dennis gage
Dennis gage to Lake Granbury Dam
Lake Granbury Dam to Glen Rose gage
Glen Rose gage to Lake Whitney Dam
Lake Whitney Dam to Aquilla Creek/Brazos Rv confluence
Lake Aquilla
Lake Aquilla Dam to Aquilla Creek gage
Aquilla Creek gage to Aquilla Creek/Brazos Rv confluence
Aquilla Creek/ Brazos confluence to Highbank gage
Lake Proctor
Lake Proctor Dam to Leon Rv at Gatesville gage
Leon Rv at Gatesville to Lake Belton Dam
Lake Belton Dam to Leon Rv nr Belton gage
Leon Rv nr Belton gage to Little River gage
Lake Stillhouse Hollow
Lake Stillhouse Hollow Dam to Lampasas Rv nr Belton gage
Lampasas Rv nr Belton gage to Little River gage
Little River gage to Little Rv/San Gabriel Rv confluence
Lake Georgetown

Reach Name
Lake Georgetown Dam to N San Gabriel gage
N San Gabriel gage to Lake Granger Dam
Lake Granger Dam to Laneport gage
Laneport gage to Little Rv/San Gabriel confluence
Little/San Gabriel confluence to Little Rv at Cameron gage
Cameron gage to Brazos Rv/Little Rv confluence
Highbank gage to Brazos Rv/Little Rv confluence
Brazos Rv/Little Rv confluence to Bryan gage
Bryan gage to Brazos Rv/Yegua Crk confluence
Lake Somerville
Lake Somerville Dam to Yegua Crk gage
Yegua Crk gage to Brazos Rv/Yegua Crk confluence
Brazos Rv/Yegua Crk confluence to Brazos Rv/Navasota Rv confluence
Lake Limestone
Lake Limestone Dam to Easterly gage
Easterly gage to Brazos Rv/Navasota Rv confluence
Brazos Rv/Navasota Rv confluence to Hempstead gage
Hempstead gage to Richmond gage
Richmond gage to Gulf of Mexico

4. Diversion Points

Table 5.1 identifies the reaches where diversions under the System Operation Permit are allowed to occur. All diversions within these reaches by BRA customers must be within the diversion limits for the applicable reach (Table 4.6). The BRA will add new diversion points as authorized by Section 297.102(b) of Title 30 of the Texas Administrative Code.

5. Firm and Non-Firm Water Availability by Location

The BRA may supply existing and future customers with water appropriated by the System Operation Permit. Firm supplies are defined in this WMP as the reliable supply of water available from the BRA System given existing or expected authorizations, infrastructure, reservoir sedimentation and contracts, and may include use of non-firm return flows and run-of-river flows, when available and when the special conditions of the System Operation Permit are met. This supply has been determined using the modeling described in Sections 2.4 and 4.3 of the WMP Technical Report. The use of non-firm appropriations will be further addressed in subsequent revisions to the WMP.

6. Reservoir Storage and Withdrawal Plans

Sections 4.1, 4.3 and 4.4 of the WMP Technical Report describe the expected operation of the BRA System reservoirs under this WMP. Storage and withdrawal of water from the System reservoirs under the various BRA authorizations will be tracked in the reservoir section of the Accounting Plan.

a. Accounting by Priority Date

BRA staff will assign all diversions made during the year to one of the existing BRA reservoir authorizations (COA No. 12-5155 through COA No. 12-5165, as amended), the Excess Flows Permit (COA No. 12-5166, as amended), or the System Operation Permit. This assignment will be shown in the Accounting Plan. BRA staff will use the following general guidelines for assigning diversions to water rights under this WMP:

1. Reservoir diversions and water supply releases will first be assigned to one of the existing BRA reservoir priority rights (COA No. 12-5155 through COA No. 12-5165). Use will be assigned the priority date of the existing right.
2. If flows at the USGS Richmond gage are greater than 2,000 cfs, use by NRG will be assigned to BRA's Excess Flows Permit (COA No. 12-5166, as amended) in accordance with the contract between NRG and BRA. This is a non-priority use.
3. If diversions or releases exceed the priority authorization of a System reservoir, the use will be assigned to another System reservoir's existing authorization under the System Order, if such authorizations are available. This is a non-priority use.
4. If System Order water is not available for reservoir diversions or releases that exceed the priority authorization of a System reservoir, then the use will be assigned to the System Operation Permit.
5. Water released or transferred via pipeline from one BRA System reservoir to another and stored in the receiving reservoir for later use will be assigned to the water right associated with the reservoir where the water

originated. The use will be assigned to the originating reservoir (using that reservoir's priority date) at the time that the water was pumped or released from the originating reservoir. Subsequent use of this stored water is not assigned a priority date and does not count against the water use from the receiving reservoir.

6. Diversion of run-of-river flows will be assigned to the System Operation Permit, using that permit's priority date. Use of downstream releases will be assigned to the water right of the reservoir where the release originated, either from the reservoir's water right or another water right pursuant to the System Order.
7. Use of BRA Return Flows at run-of-river diversions will be assigned to the System Operation Permit. For BRA Return Flows used at a BRA System reservoir, use of such return flows will occur under the reservoir's existing priority right. However, if System Operation Permit diversions are occurring at the reservoir, BRA Return Flows flowing into the reservoir may be used to the extent they are available and will be assigned the System Operation Permit priority date.

b. Conditions for Refilling Storage Emptied Under the System Operation Permit

If storage is emptied by the System Operation Permit, as opposed to the reservoir's existing water right, that storage can only be refilled with water appropriated at the priority date of the System Operation Permit. The reservoir accounting plan tracks where storage would be if there were no System Operation Permit diversions and identifies days in which water was used to fill storage under the System Operation Permit. This calculation identifies days when the terms and conditions of the System Operation Permit regarding reservoir storage are engaged. When a reservoir fills storage that would be emptied if the reservoir were operating solely under its existing right, all inflows available to BRA after senior rights are satisfied are appropriated under the reservoir's existing right.

c. Accounting for High Flow Pulses Impounded Under the System Operation Permit

Accounting for HFPs for reservoir inflow is only needed at reservoirs where diversions or releases have been made under the System Operation Permit and have created empty storage under the System Operation Permit. The reservoir accounting described above in Section V.D.6.b will track storage emptied under the System Operation Permit. BRA staff will monitor these calculations. When storage emptied under the System Operation Permit is being refilled, BRA staff will monitor the inflows to see if these flows qualify as an HFP. If the flows that refill storage emptied under the System Operation Permit qualify as an HFP, then BRA staff will record these inflows in the reservoir section of the Accounting Plan. If necessary, some of these inflows may need to be passed to meet environmental flow criteria using the guidelines discussed in Section V.D.1.b above.

The BRA is not obligated to pass the entire Qualifying HFP, only enough flow to meet or exceed the applicable pulse flow trigger level, and either to last at least as long as the required duration criterion, or to meet the volume criterion. If a Qualifying HFP starts in one season and ends in the next, the credit for the Qualifying HFP will be given to the season in which the HFP ends.

Inflows impounded under the System Operation Permit that are in excess of the WMP environmental flow requirements may be released downstream at BRA's discretion. If appropriate, this release will be recorded as a Qualifying HFP in the Accounting Plan. The release will be made using the release guidelines in Section V.D.1.b.