# Item VI: Consider Approval of the Technical Memorandum and Authorizing the Nueces River Authority/HDR to Submit to the TWDB

The TWDB requires each regional water planning group to submit a technical memorandum as a mid-cycle status update on 2026 Regional Water Plan activities. The technical memorandum will include the following information, per TWDB guidance:

- Region N's adopted process for identifying potentially feasible water management strategies,
- List of potentially feasible water management strategies to date,
- Hydrologic variance requests and TWDB approvals,
- Documentation of methodology for calculating sedimentation rate and elevation-area-capacity rating curves,
- Summary of hydrologic models use,
- Methods used for RFPG- estimated groundwater availabilities,
- Interregional coordination efforts to date,
- List of infeasible strategies from the 2026 Plan,
- TWDB DB27 data reports on population, demand, source availability, existing supply, water needs, comparison between 2026 Plan and 2021 Plan data (seven total in PDF form),
- Model files to determine water availability (electronic submittal).

A preliminary draft technical memorandum is included in this packet for consideration.

**RECOMMENDATION:** Region N approval of Technical Memorandum and Authorizing NRA to submit to TWDB by March 4, 2024 deadline





2026 Coastal Bend Region N – Regional Water Plan

DRAFT- TECHNICAL MEMORANDUM (For RWPG Consideration

Coastal Bend Region, Texas March x, 2024



2026 Coastal Bend Region N – Regional Water Plan TECHNICAL MEMORANDUM

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2026 Coastal Bend Region N – Regional Water Plan TECHNICAL MEMORANDUM

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In accordance with the Texas Administrative Code §357.12 and Section 2.12.1 of the Second Amended General Guidelines for Development of the 2026 Regional Water Plans, the Coastal Bend (Region N) Regional Water Planning Group submits this technical memorandum for consideration by the TWDB.

This technical memorandum presents:

- Data reports on population, demand, source availability, existing supply, water needs, comparison between 2026 Plan and 2021 Plan data;
- Region N's adopted process for identifying potentially feasible water management strategies,
- List of potentially feasible water management strategies to date,
- Hydrologic variance requests and TWDB approvals,
- Documentation of methodology for calculating sedimentation rate and elevationarea-capacity rating curves,
- Summary of hydrologic models use,
- Methods used for RFPG- estimated groundwater availabilities,
- Interregional coordination efforts to date,
- List of infeasible strategies from the 2026 Plan, and
- Model files to determine water availability (electronic submittal).

The appendix includes the seven- DB27 reports requested by the TWDB for inclusion in the technical memorandum. The contents of this technical memorandum were approved at Region N's public meeting on February 22, 2024 that included the 14-day public notice and posting requirements.

# 1 DB27 Data Reports

The following DB27 reports are provided in Appendix A of this document.

- Report # 1- Water User Group (WUG) Population Projections
- Report # 2- WUG Water Demand Projections
- Report # 3- Source Availability
- Report # 4- WUG Existing Water Supply
- Report # 5- WUG Needs/Surplus
- Report # 6- WUG Data Comparison to 2026 RWP
- Report # 7- Source Data Comparison to 2026 RWP

# 2 Documented Process used by the Coastal Bend Regional Water Planning Group to Identify Potentially Feasible Water Management Strategies

During Region N's meeting on October 12, 2023, the planning group discussed the types of water management strategies shown in Table 2-1 that regional water planning groups are advised to consider for identified water needs as provided in TWDB guidance<sup>1</sup> and as required by Texas Water Code §16.053(e)(3) and 31 Texas Administrative Code §357.34(c).

Table 2-1. Types of Potentially Feasible Water Management Strategies Considered byRegion N, per Statutory Guidance

Conservation	Interbasin Transfers
Drought Management	System Optimization
Reuse	Reallocation of Reservoir Storage to New Uses
Management of Existing Supplies	Yield Enhancement
Conjunctive Use	Water Quality Improvements
Acquisition of Available Existing Supplies	New Surface Water Supply
New Water Supplies	New Groundwater Supply
Regional Water Supply Facilities	Brush Control
Desalination – Seawater	Precipitation Enhancement
Desalination – Brackish Groundwater	Aquifer Storage and Recovery
Voluntary Redistribution	Cancellation of Water Rights
Emergency Transfers	Rainwater Harvesting

<sup>&</sup>lt;sup>1</sup>Section 5.1 of the First Amended General Guidelines for Fifth Cycle of Regional Water Plan Development, Exhibit C, April 2017.

The Coastal Bend Regional Water Planning Group (RWPG) adopted the following process on October 12, 2023 to use to identify potentially feasible water management strategies for development of the 2026 Region N Regional water Plan (2026 Plan)<sup>2</sup>:

1) The Coastal Bend RWPG recognizes that regional water planning is an evolving process and draws upon results obtained from previous planning efforts. A summary of water management strategies (WMSs) from the five previous planning cycles (2001, 2006, 2011, 2016, 2026 Plans) will be discussed at a Region N meeting for consideration for the 2026 Plan. The Texas Water Code list of WMSs eligible for consideration in the Plan will be discussed, including TWDB Water Loss Audit Report, conservation best management practices, and drought management as required by TWDB guidance.

2) The Nueces River Authority will host a workshop for water utilities located within the 11-county Region N area to discuss local plans and assess potential regional collaboration opportunities. Current local, on-going studies and future water plans, including specific WMSs of interest, will be solicited from Water User Groups (WUGs) and Wholesale Water Providers (WWPs).

3) Considering information compiled from outreach, a draft list of potentially feasible WMSs will be discussed at a Coastal Bend RWPG meeting for public comment.

4) HDR, technical consultant, will follow-up with WUGs and WWPs to confirm the list of water management strategies for development of the 2026 Plan.

5) The Coastal Bend RWPG will consider forming a subcommittee to review potentially feasible strategies and prepare a draft scope of work for strategies to evaluate for the 2026 Plan. The scope of work subcommittee will review a preliminary list of potentially feasible WMSs and prepare a recommendation for Coastal Bend RWPG consideration given TWDB funding allocations.

6) A scope of work for strategies to be evaluated will be considered and adopted at a RWPG meeting after receiving public comment. Subsequently, the Nueces River Authority will submit a letter request for TWDB consideration and approval.

7) Based on the adopted list of potentially feasible water management strategies, potential water management strategies will be identified to meet needs for all WUGs and WWPs with identified needs. If no potentially feasible strategy can be identified for a WUG or WWP with a need, the reason for this will be documented in the Technical Memorandum, IPP and Final Plan.

8) The list of potentially feasible water management strategies will be included in the Technical Memorandum, IPP, and Final Plan.

9) After TWDB approval of the scope of work for water management strategy evaluations, additional water management strategies may be considered and approved for inclusion in the 2026 Plan at WUG sponsor request and expense. These strategies will be brought to the Coastal Bend RWPG for consideration as potentially feasible WMSs and if approved will be included in the Initially Prepared Plan and Final Plan.

<sup>&</sup>lt;sup>2</sup> Pursuant to Texas Administrative Code Title 31 Part 10 Chapter 357.5(e)(4) of the Regional Water Planning Guidelines which states: "Before a regional water planning group begins the process of identifying potentially feasible water management strategies, it shall document the process by which it will list all possible water management strategies and identify the water management strategies that are potentially feasible for meeting a need in the region."

# 3 List of Potentially Feasible WMSs Identified by the Coastal Bend Regional Water Planning Group

A summary of water management strategies (WMSs) from the five previous planning cycles (2001, 2006, 2011, 2016, 2021 Plans) was discussed at the January 25, 2024 Region N meeting. A draft list of potentially feasibility water management strategies (WMSs) for the 2026 Plan was discussed. The list included strategies evaluated in previous plans, consideration of the types of water management strategies outlined in TWDB guidance (Table 2-1), and additional water management strategies identified by Wholesale Water Providers and Water User Groups during interviews conducted by HDR from October 2023 to January 2024 to gather feedback on local, on-going studies and future water supply plans. During the January 25<sup>th</sup> Region N meeting, comments were provided by regional water planning group members and local stakeholders to add four water management strategies from previous regional water plans, two new strategies related to transmission system improvements to boost existing supply resiliency, and one potential reuse project.

The Nueces River Authority hosted a workshop on January 26<sup>th</sup> for water utilities, water providers, and local stakeholders to discuss local plans, assess potential regional collaboration opportunities, and receive public input. Table 3-1 summarizes the list of potentially feasible WMSs identified by the Coastal Bend Regional Water Planning Group to date. A subcommittee appointed on October 12, 2023 will review the list of potentially feasible water management strategies (Table 3-1) and prioritize water management strategies to be included in the TWDB scope of work request, which requires approval by TWDB for notice to proceed to begin Task 5B- Evaluation of Water Management Strategies. The subcommittee will present a draft Task 5B scope of work at the next Region N meeting on May 9<sup>th</sup>. It is important to note that not all strategies listed below will be evaluated and/or recommended in the 2026 Region N Plan due to lack of sponsor, funding constraints, or other factors. This list is strictly a list of potentially feasible water management strategies identified to date for inclusion in the Technical Memorandum in accordance with TWDB guidance.

The City of Alice is currently implementing a 3 MGD brackish groundwater WMS and anticipates the project to be delivering water by the end of 2024. Since this strategy is actively in construction for completion prior to delivery of the 2026 Region N Plan, it is not included in the list of potentially feasible water management strategies.

# Table 3-1. Tabular List of Potentially Feasible Water Management Strategies forConsideration in the 2026 Region N Plan

Municipal Water Conservation, including meter replacement

Irrigation Water Conservation

Manufacturing Water Conservation

Mining Water Conservation

**Drought Management** 

Mary Rhodes Pipeline Rehabilitation

Evangeline Groundwater Project, up to 24 MGD with Brackish Groundwater Desalination

Gulf Coast Aquifer Supplies- Additional Groundwater for Rural Entities

City of Corpus Christi- Inner Harbor Seawater Desalination Project, up to 30 MGD

City of Corpus Christi- La Quinta Seawater Desalination Project, up to 40 MGD

Port of Corpus Christi Authority- Harbor Island Seawater Desalination Project, up to 50 MGD

Local Balancing Storage Reservoir to make reliable run-of-the-river rights, affected by drought

Nueces Off-Channel Reservoir Project

City of Corpus Christi- Aquifer Storage and Recovery

Pipeline from Choke Canyon Reservoir to Lake Corpus Christi

Nueces River Diversion to Choke Canyon Reservoir

San Patricio Municipal Water District Water Treatment Plant (WTP) Improvements- Microfiltration

City of Corpus Christi- ON Stevens WTP Facility Expansion

San Patricio Municipal Water District- Replacement of Nueces River Raw Water Transmission Main

Port of Corpus Christi Authority- La Quinta Seawater Desalination Project, up to 30 MGD

Sediment Removal in Lake Corpus Christi and Choke Canyon Reservoir

San Patricio Municipal Water District- Transmission Pump Station at Dressen Improvements

Reclaimed Wastewater Supplies and Reuse- Nueces County

Air capture wells- Duval County Irrigation

# 4 Hydrologic Variance Requests Submitted by the Region and TWDB Approval of Variances

The TWDB guidelines<sup>3</sup> state that planning groups must use firm yield and TCEQ WAM Run 3 for determining current and future water supplies unless a hydrologic variance request is approved by the TWDB Executive Administrator for variations from the standard modeling requirements.

At the Region N meeting on May 18, 2023, Region N discussed the TCEQ WAMs relevant to surface water supplies in the region and the City of Corpus Christi Water Supply Model (formerly NUBAY model). In 1990, the City of Corpus Christi developed the Lower Nueces River Basin and Estuary Model (NUBAY) to evaluate its multi-basin regional water supply system subject to environmental flow provisions and reservoir operating policies. Since then, the City and other public agencies have supported enhancements and updates to the NUBAY model, which has been renamed the City of Corpus Christi Water Supply Model. The previous Region N Plans (2006, 2011, 2016, and 2021) used the Corpus Christi Water Supply Model to evaluate water availability, with safe yield as a basis for developing water planning and needs analysis for the City of Corpus Christi and its customers. The Corpus Christi Regional Water Supply System, simulated by the Corpus Christi Water Supply Model, includes the City's contracted and/or permitted water rights from Choke Canyon Reservoir, Lake Corpus Christi, Lake Texana, and the Lower Colorado River.

In 2017, the Corpus Christi Water Supply Model was updated to include:

- Recent hydrology through 2015 to include the most recent drought of record for a total model period of 82 years (1934 to 2015), including extensions to net evaporation and ungaged runoff below LCC for recent hydrology using methods consistent with previous model version (1934 to 2003);
- New TWDB volumetric survey data for Lake Corpus Christi (2016), Choke Canyon Reservoir (2012), and Lake Texana (2010) with updated sedimentation rates;
- Recent hydrology for Lake Texana and the Colorado River (for Mary Rhodes Phase II supplies) through 2015;
- Lake Texana callback of 5,400 ac-ft/yr as exercised by LNRA for local water users in Jackson County pursuant to City of Corpus Christi contract terms; and
- Verification that all enhancements maintain the provisions of the TCEQ 2001 Agreed Order.

In 2019, additional model updates were made to include:

- Lake Texana callback of 10,400 ac-ft/yr as exercised by LNRA for local water users in Jackson County pursuant to City of Corpus Christi contract terms; and
- Operational flexibility to exercise water supply calls on the Garwood water right on the Colorado River at a variable rate according to diversion rate and priority date of the rights and based on MRP Phase II system capacities.

<sup>&</sup>lt;sup>3</sup> Second Amended General Guidelines for Development of the 2026 Regional Water Plans, September 2023.

The Region N planning group does not consider the TCEQ Nueces Basin WAM Run 3 to be the best model to simulate the Corpus Christi Regional Water Supply System operation policy subject to permits nor does it reflect all aspects of the TCEQ 2001 Agreed Order. Furthermore, the hydrology ends in 1996 and doesn't cover the recent drought of record.

At the May 18, 2023 Region N meeting, the planning group also considered TWDB's guidance to use firm yield when determining surface water availability. The City's regional water supply system is prone to severe drought. Average annual inflows to Lake Corpus Christi and Choke Canyon System are lower with each successive drought, with the most recent hydrology update to the Corpus Christi Water Supply Model (through 2015) showing a *new* drought of record for the Corpus Christi Regional Water Supply System. Safe yield is a standard approach that Region N and the City of Corpus Christi have consistently used in previous planning cycles as a provision for climate and growth uncertainty, such that a *specified reserve amount remains* in storage during the modeled critical drought.

At the Coastal Bend Meeting on May 18, 2023, the Coastal Bend RWPG approved submittal of a hydrologic variance request to the TWDB Executive Administrator to (1) use the Corpus Christi Water Supply Model to evaluate water availability for the Corpus Christi Regional Water Supply System and (2) use of safe yield with 75,000 acft reserve and the City's reservoir operating policies to calculate water availability from the Corpus Christi Regional Water Supply System for the 2026 Region N Water Plan. The TWDB approved the hydrologic variance request on January 8, 2024. A copy of the hydrologic variance request submitted by Region N, additional background information related to the request, and TWDB approval of variance is included in Appendix B.

Surface water availability for all other surface water rights, including run of the river rights, is based on TCEQ WAM Run 3. Pursuant to TWDB guidance "Run of river availability, or firm diversion, evaluated for a municipal sole-source water use, is defined as the minimum monthly diversion amount that is available 100% of the time during a repeat of the drought of record (i.e., this minimum volume must be available each and every month)."

5 Methodology Utilized for Calculating the Anticipated Sedimentation Rate and Revised Area-Capacity Rating Curve for Reservoirs

The Corpus Christi Water Supply Model, used to calculate surface water availability for the Corpus Christi Regional Water System, includes a 82 year hydrologic period from 1934 to 2015. used reservoir sedimentation estimates for 2020, 2030, 2060 and 2070 in the model from the 2021 Regional Water Plan. For 2050 and 2080, existing data was used to interpolate sedimentation rates for 2050 and extrapolate for 2080 including updating areas and capacities for the reservoirs expected to correspond with these decades. This method relies on the sedimentation rates for reservoirs simulated in the model and from the adopted 2021 Regional Water Plan.

For Nueces County WCID 3 and smaller run-of-river water rights in the Nueces River Basin, firm yield supplies were based on the minimum annual supply that could be diverted over a historical period of record limited by minimum month conditions in accordance with TWDB

guidelines. Run-of-river availabilities were simulated for these water users using the TCEQ unmodified Nueces WAM Run 3, which determined monthly availability subject to water right priority and hydrologic conditions. Minimum month conditions were assessed within the context of use-appropriate monthly percentage of the annual firm diversion. The TCEQ Nueces Basin WAM hydrology ends in 1996 and doesn't cover the recent drought of record. It is anticipated that storage will be identified as a water management strategy to bridge potential seasonal water shortages to avoid overestimating the reliability of run-of-river water during drought.

# 6 Preliminary Surface Water Availability Analysis and Summary Table of Hydrologic Models Used

Table 6-1 presents surface water supplies available to Region N, including safe yield for entities where hydrologic variances were approved. For surface water withdrawals that do not require permits, such as for livestock purposes, Region N estimated local annual water availability volumes under drought of record conditions based on current water use data provided by the TWDB. Region N's consultant is coordinating with wholesale water providers to confirm water contracts and infrastructure constraints. This may constrain existing surface water supplies and result in supplies from the Corpus Christi Regional Water Supply System being lower than the availability shown.

Table 6-1. Surface Water Supplies Available to Region N (Not limited by infrastructure)

Source	Entity Using	Alternative			Surface Water Availability (ac-f					-ft/yr)	
		Utilized as the Basis for Planning	Model Used	Basis	2030	2040	2050	2060	2070	2080	
Corpus Christi Regional Water Supply System <sup>1</sup>	City of Corpus Christi and its direct/indirect customers	Yes	Corpus Christi Water Supply Model <sup>2</sup>	Safe Yield- 75,000 acft reserve	170,000	168,000	166,000	164,000	162,000	157,000	
Nueces- Run of the River	Nueces County WCID #3 <sup>3</sup>	No	TCEQ Nueces WAM	Firm Yield	384	384	384	384	384	384	

N/A- Not applicable.

<sup>1</sup>Includes Corpus Christi contract with the City of Three Rivers to divert up to 3 MGD (or 3,363 acft/yr) from Choke Canyon. <sup>2</sup>See details on model modification assumptions, described in Section 4.

<sup>3</sup>Subject to Nueces County WCID # 3's Certificate of Adjudication provisions for No. 2466, 1909+ priority, no storage.

The following models were used to develop surface water availabilities for the 2026 Region N Plan.

- Corpus Christi Water Supply Model
- TCEQ Nueces Basin Water Availability Model

Details of the model runs performed to determine surface water availability are included in Table 6-2.

Name of Model (and version)	Model Use/Entities Served	Date Modifications were Approved by TWDB	Run Performed by	Date of Model Run	Model Inputs/Output Files Used	Comments
Corpus Christi Water Supply Model v.13	Corpus Christi Regional Water Supply System	January 8, 2024	HDR	2/9/2024	/2030_SY_75/ and /2080_SY_75/ OSUM; OASYSOP OCCR; OLCC OQEST; OQM OSALTTRC; OSYSOP OTEX; OTEXOP OTRACE; OWQ OBAY; OBBEST DAIYP; ADDSOUR	2020 and 2080- Safe Yield; Includes timeseries from Region K LCRA Cutoff unmodified Run 3 2030- 2080 conditions for the City of Corpus Christi's Garwood/ Colorado Water Right.
TCEQ Nueces WAM- Run 3	Run of the River Right Holders, including NCWCID # 3	Not Applicable	HDR	5/3/2018	/2020/ and /2070/ N_RUN3.DAT N_RUN3.DIS N_RUN3.EVA N_RUN3.flo N_RUN3.out (Note: to minimize file size, output file not included in CD)	Consistent yield for 50 year period; 2080 set equal to 2070.

## Table 6-2. Models Used in Determining Surface Water Availability in Region N

# 7 Groundwater Availability and Methodologies Utilized by Coastal Bend RWPG- Estimated Groundwater Availabilities

Three groundwater management areas (GMAs) are represented within the Region N 11county area: GMA 13, GMA 15, and GMA 16. These GMAs adopted new desired future conditions (DFCs) between October and November 2021, as summarized in Table 7-1. These DFCs were then used by the TWDB to develop Modeled Available Groundwater estimates (MAGs) for use in development of the 2026 Region N Regional Water Plan. A summary of the MAGs and associated TWDB model run and date of TWDB model simulation from which the MAGs originated is included in Table 7-2. These MAG projections based on GMA-approved desired future conditions were discussed at Region N's meeting on October 12, 2023 and confirmed to serve as the basis of groundwater availability in the 2026 Region N Plan.

Aquifer	Desired Future Condition						
GMA 13 (Date DFC Adopted 11/19/2021)							
Carrizo-Wilcox, Queen City, and Sparta Aquifer System	Average drawdown of 48 feet (+/- 5 feet) for all of GMA 13 calculated from the end of 2012 conditions to the year 2080						
GMA 15 (Date DFC	Adopted 10/14/2021)						
Aransas Gulf Coast Aquifer System	0 feet of drawdown of the Gulf Coast Aquifer System						
Bee Gulf Coast Aquifer System	7 feet of drawdown of the Gulf Coast Aquifer System						
GMA 16 (Date DFC Adopted 11/23/2021)							
Bee GCD Gulf Coast Aquifer System	93 feet of drawdown of the Gulf Coast Aquifer System						
Live Oak UWCD Gulf Coast Aquifer System	45 feet of drawdown of the Gulf Coast Aquifer System						
McMullen GCD Gulf Coast Aquifer System	12 feet of drawdown of the Gulf Coast Aquifer System						
Kenedy County GCD Gulf Coast Aquifer System	27 feet of drawdown of the Gulf Coast Aquifer System						
Brush Country GCD Gulf Coast Aquifer System	89 feet of drawdown of the Gulf Coast Aquifer System						
Duval County GCD Gulf Coast Aquifer System	137 feet of drawdown of the Gulf Coast Aquifer System						
San Patricio County GCD Gulf Coast Aquifer System	69 feet of drawdown of the Gulf Coast Aquifer System						
Non-District Kleberg Gulf Coast Aquifer System	21 feet of drawdown of the Gulf Coast Aquifer System						
Non-District Nueces Gulf Coast Aquifer System	26 feet of drawdown of the Gulf Coast Aquifer System						

Table 7		E. de ma			les e		ing F		
Table 7-	1. Desirea	Future	Conditions	Adopted	Dy	GIVIAS	IN F	kegion	N

Aquifer	County	Region	River Basin	Modeled Available Groundwater (ac-ft/yr)						
				2030	2040	2050	2060	2070	2080	
		GM	A 13 (Model Rur	n: GR21-018	MAG, dated	7/25/2022)				
Carrizo- Wilcox	McMullen	N	Nueces	7,768	4,867	4,854	4,854	4,854	4,854	
Queen City	McMullen	N	Nueces	3	3	3	3	3	3	
		GM	A 15 (Model Rur	n: GR21-020	MAG, dated	8/16/2022)				
Gulf Coast	Aransas	N	San Antonio- Nueces	1,547	1,547	1,547	1,547	1,547	1,547	
Gulf Coast	Bee	N	San Antonio- Nueces	8,001	8,003	7,983	7,985	7,986	7,972	
Gulf Coast	Bee	N	Nueces	26	26	26	26	26	26	
GMA 16 (Model Run: GR21-021 MAG, dated 10/31/2022)										
Gulf Coast	Bee	N	Nueces	2,943	3,129	3,216	3,267	3,267	3,267	
Gulf Coast	Bee	N	San Antonio- Nueces	32,604	34,650	35,616	36,171	36,171	36,171	
Gulf Coast	Brooks	N	Nueces-Rio	10,246	10,706	11,014	11,476	12,874	12,874	
Gulf Coast	Duval	N	Nueces	702	752	802	856	856	856	
Gulf Coast	Duval	N	Nueces-Rio	43,636	46,776	49,924	53,070	53,070	53,070	
Gulf Coast	Jim Wells	N	Nueces	1,186	1,186	1,186	1,186	1,362	1,362	
Gulf Coast	Jim Wells	N	Nueces-Rio	17,604	18,366	19,164	19,852	22,736	22,736	
Gulf Coast	Kenedy	N	Nueces-Rio	20,208	23,396	25,524	28,716	30,842	30,842	
Gulf Coast	Kleberg	N	Nueces-Rio	18,078	19,978	21,374	23,274	24,284	24,284	
Gulf Coast	Live Oak	N	Nueces	22,652	20,764	20,466	20,466	20,466	20,466	
Gulf Coast	Live Oak	N	San Antonio- Nueces	136	124	122	122	122	122	
Gulf Coast	McMullen	N	Nueces	1,020	1,020	1,020	1,020	1,020	1,020	
Gulf Coast	Nueces	N	Nueces-Rio	1,512	1,574	1,632	1,690	1,690	1,690	
Gulf Coast	Nueces	N	Nueces	12,062	12,582	13,080	13,596	13,636	13,636	

## Table 7-2. Modeled Available Groundwater Values and Details on Related TWDB Model Runs

Aquifer	County	Region	River Basin	Modeled Available Groundwater (ac-ft/yr)					
				2030	2040	2050	2060	2070	2080
Gulf Coast	San Patricio	N	Nueces	9,004	9,748	10,494	11,238	11,238	11,238
Gulf Coast	San Patricio	N	San Antonio- Nueces	<u>81,028</u>	<u>83,096</u>	<u>85,162</u>	<u>87,230</u>	<u>87,230</u>	<u>87,230</u>
Total Modeled Available Groundwater (acft/yr)			291,966	302,293	314,209	327,645	335,280	335,266	
Gulf Coast Aquifer Only (acft/yr)				284,195	297,423	309,352	322,788	330,423	330,409

## Table 7-2. Modeled Available Groundwater Values and Details on Related TWDB Model Runs

Region N did not perform any independent analyses using groundwater availability models (GAM) to estimate groundwater availability, nor were any alternative methods utilized by Region N to estimate groundwater availabilities.

Groundwater supplies in the 2026 Region N Water Plan are based on MAG projections provided by the TWDB, constrained by well capacity as reported in TCEQ PWS database. The average annual capacity was estimated to be ½ the rated or tested capacity to account for potential seasonal peaking conditions. For non-municipal groundwater users with groundwater capacities that are not readily obtained from publicly available sources, the groundwater supply was calculated based on TWDB historical water use records (2010-current) using the maximum groundwater use reported over the most recent decade. The final step in determining groundwater supplies was to compare the MAG-preserved well capacities to projected demands for each WUG that has historically relied on groundwater. Groundwater supply was set equal to the amount of capacity or water demand, whichever is lower.

For water user groups that use both groundwater and surface water supplies, it was generally assumed that the water user group would use groundwater up to its well capacity (limited by MAG) and then use available surface water per rights or contracts to total the projected water demand through combination of groundwater and surface water supplies. However, for South Texas Water Authority (STWA) customers that rely on both surface and groundwater supplies, surface water supplies were allocated based on historical water use records provided by STWA accounting for modest growth subject to surface water availability, with the remaining water supplies provided by groundwater up to water demand subject to MAG and capacity constraints. Region N assumes that excess groundwater beyond demands would not be pumped and therefore would be available as a collective resource for future water management strategy development subject to adopted MAGs.

The TWDB allows the regional water planning groups to utilize a MAG peak factor for determining groundwater availability, if needed. Region N is not requesting to utilize the MAG peak factor option for any counties in Region N.

# 8 Interregional Coordination

The TWDB guidance<sup>4</sup> requires regional water planning groups to discuss and document interregional coordination efforts at multiple points during the planning cycle. Interregional coordination efforts may include but are not limited to, the region's use of regional liaisons, forming committees to meet with neighboring regions or their representatives, and authorizing RWPG administrators or planning group consultants to meet with neighboring regions or their representatives.

The Coastal Bend RWPG participates in interregional coordination through member participation in the Interregional Planning Council (Carl Crull, Other- Representative), Nueces River Authority's participation in the South Central Texas (Region L) Regional Water Planning Group (Travis Pruski, Region L County Representative), and technical consultant coordination with the Lower Colorado River (Region K), Lavaca (Region P), South Central Texas (Region L), and Rio Grande (Region M).

As Region N's liaison to Region L, Carl monitors Region L's agendas and supporting documentation for any issues that might affect the Coastal Bend region. Through Carl's participation in the Interregional Planning Council, he attended on behalf of HDR virtual meetings on March 9, May 30, August 15, 2023 and February 8,2024. The Interregional Planning Council Report has been adopted and is being signed by the council members and should be available in final form in the next two weeks.

The Nueces River Authority, administrator for the Coastal Bend Region N, participated in Region L RWPG meetings on February 2, 2023, May 4, 2023, August 3, 2023, November 2, 2024, and February 14, 2024.

Several coordination calls and emails between the Coastal Bend RWPG technical consultant and Lower Colorado River (Region K), South Central Texas (Region L), Lavaca (Region P), and Rio Grande (Region M) have occurred and will continue through development of the 2026 plan. There are no known interregional coordination conflicts for any water management strategies being considered in the 2026 Coastal Bend Plan at this time.

On October 7, 2021, the Coastal Bend RWPG held a preplanning public meeting to discuss how the planning group will conduct interregional coordination and collaboration regarding water management strategies. At this meeting, the Coastal Bend RWPG considered the 2020's Interregional Planning Council recommended actions assigned to RWPGs. The Coastal Bend RWPG received a letter from the Interregional Planning Council on February 12, 2024 with suggestions for 2026 Regional Water Plan development which will be considered during plan development.

<sup>&</sup>lt;sup>4</sup> Second Amended General Guidelines for Development of the 2026 Regional Water Plans, September 2023.

# 9 Infeasible Water Management Strategies or Projects from the Coastal Bend 2021 Regional Water Plan

A new requirement for this cycle of regional planning is to identify infeasible water management strategies and projects that were recommended in the 2021 Regional Water Plans. According to TWDB guidance, "At minimum, RWPGs must review the status of recommended strategies and projects with an online decade of 2020 in the 2021 RWPs." A list of these recommended strategies and projects were provided to Region N in January 2023 in supporting data spreadsheets. RWPGs are also encouraged to review additional near-term strategies or projects with lengthy permitting or construction processes. RWPGs must document the region's process for determining infeasible WMSs.

In accordance with the Texas Water Code (§16.053(h)(10)), a strategy or project is considered infeasible if:"...the proposed sponsor of the water management strategy or project has not taken an affirmative vote or other action to make expenditures necessary to construct or file applications for permits required in connection with the implementation of the water management strategy or project under federal or state law on a schedule that is consistent with the completion of the implementation of the water management strategy or project by the time the water management strategy or project is projected by the regional water plan or the state water plan to be needed." An infeasibility review is not required for strategies or projects that do not require a permit or involve construction (i.e. water conservation). TWDB recognizes that information may be difficult to obtain for some categories of water users, such as those projects associated with county-wide water user groups. A region may therefore not be able to determine infeasibility for some strategies or projects. If responses are not received from a WUG or sponsor regarding status of a WMS, it may still be considered feasible.

In accordance with contract guidance for the 2021 RWPs, recommended strategies and projects with an online decade of 2020 were required to be online and delivering water by January 5, 2023. If any such strategies and projects are not currently implemented by this date and the project sponsor has not taken any affirmative steps towards implementation, the 2021 RWP must be amended to remove or revise the strategy or project to make them feasible. Affirmative steps by the sponsor may include but are not limited to 1) spending money on the strategy or project, 2) voting to spend money on the strategy or project, or 3) applying for a federal or state permit for the strategy or project.

The following WUGs were identified as showing WMS in the 2021 Plan for the 2020 decade. Sponsors with water management strategies shown as being implemented by the 2020 decade were contacted and status update is included below. Note: County-wide strategies were not targeted for outreach.

- City of Alice- Brackish Groundwater Desalination
  - This is a feasible strategy and should remain in the 2021 Plan. Active steps have been taken and project is anticipated to be delivering finished water by end of 2024.
- El Oso WSC- Additional groundwater well
  - Sponsor was contacted. El Oso refurbished an existing well. Awaiting additional information on capacity.

- San Diego MUD 1- Additional groundwater well
  - Sponsor was contacted. No additional info available.
- TDCJ Chase Field- Additional groundwater well
  - Sponsor was contacted. No additional info available.
- Nueces County WCID 3- Local Balancing Storage Reservoir
- Sponsor was contacted. No additional info available.
- Corpus Christi- O.N. Stevens WTP Improvements
  - This is a feasible strategy and should remain in the 2021 Plan. Active steps have been taken and project is anticipated to be completed in 2024.

The Coastal Bend RWPG discussed 2021 Region N Plan strategies with an online decade of Year 2020 at the January 26, 2023 Region N meeting and TWDB supporting data spreadsheets for consideration of infeasible strategies at the October 12, 2023 meeting.

The Coastal Bend Regional Water Planning Group (RWPG) adopted the following process on October 12, 2023 for determining infeasible water management strategies for the Coastal Bend Regional Water Plan.

- The Coastal Bend Regional Water Planning Group (RWPG) will consider TWDB guidance regarding identifying infeasible water management strategies recommended in the 2021 Region N Plan.
- Review supporting data<sup>5</sup> provided by TWDB on water management strategies (WMS) and associated projects from the 2021 Region N Plan.
- Conduct outreach to project sponsors to determine project status and assess infeasibility.
- Present the results of outreach, and analysis where applicable, at a Region N RWPG meeting. This must occur at the same meeting where the RWPG presents its process for identifying potentially feasible WMSs in the current plan under Task 5A.
- If responses are not received from a WUG or sponsor regarding status of a WMS, it will remain feasible (i.e. no action will be taken to warrant amendment to the 2021 Plan). WMSs previously identified for County-Other WUGs will remain feasible.
- The Coastal Bend RWPG will include in the Technical Memorandum a list of RWPG identified infeasible strategies for projects from the 2021 RWPs, or a statement that no infeasible strategies or projects were identified. If infeasible strategies are identified, the RWPG will prepare an amendment to the 2021 Regional Water Plan to revise/remove infeasible strategies and submit to the TWDB by the June 5, 2024 deadline.

Based on the results of sponsor outreach and discussion by Region N RWPG for projects that were unable to be confirmed, no infeasible strategies or projects were identified.

<sup>&</sup>lt;sup>5</sup> Sent by TWDB to Region N on January 10, 2013. Includes the following data sheets that were reviewed: '2022SWPWMS&ProjectFeasibilityAnalysis\_WMSWorkbook+RegN.xls' 2022SWPWMS&ProjectFeasibilityAnalysis\_WMSProjectWorkbook+RegN.xlxs and 2022SWPWMS&ProjectFeasibilityAnalysis\_WMSDetails&ProjectRelationships.xlxs

2026 Coastal Bend Region N – Regional Water Plan TECHNICAL MEMORANDUM





# Appendix A

DB27 Reports:

In progress, to be provided at the Feb  $22^{\mbox{\scriptsize nd}}$  Region N Meeting

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2026 Coastal Bend Region N – Regional Water Plan TECHNICAL MEMORANDUM

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# Appendix B

Hydrologic Variance Request(s) and TWDB Approval Letters

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Appendix B: Hydrologic Variance Request(s) and TWDB Approval Letters

# Surface Water Hydrologic Variance Request Checklist

Texas Water Development Board (TWDB) rules<sup>1</sup> require that regional water planning groups (RWPG) use the most current Water Availability Models (WAM) from the Texas Commission on Environmental Quality (TCEQ) and assume full utilization of existing water rights and no return flows for surface water supply analysis. Additionally, evaluation of existing stored surface water available during Drought of Record conditions must be based on Firm Yield using anticipated sedimentation rates. However, the TWDB rules also allow, and **we encourage**, RWPGs to use more representative, water availability modeling assumptions; better site-specific information; or justified operational procedures other than Firm Yield with written approval (via a Hydrologic Variance) from the Executive Administrator in order to better represent and therefore prepare for expected drought conditions.

RWPGs must use this checklist, which is intended to save time and reduce effort, to request a Hydrologic Variance for estimating the availability of surface water sources. For Questions 4 – 10, please indicate whether the requested variance is for determining Existing Supply, Strategy Supply, or both. Please complete a separate checklist for each river basin in which variances are being requested.

## Water Planning Region: N

1. Which major river basin does the request apply to? Please specify if the request only applies part of the basin or only to certain reservoirs.

Nueces Basin. Specifically, the water supply available to the City of Corpus Christi from the Choke Canyon Reservoir and Lake Corpus Christi.

2. Please give a brief, bulleted, description of the requested hydrologic variances including how the alternative availability assumptions vary from rule requirements, how the modifications will affect the associated annual availability volume(s) in the regional water plan, and why the variance is necessary or provides a better basis for planning. You must provide more-detailed descriptions in the subsequent checklist questions. Attach any available documentation supporting the request.

The Coastal Bend Regional Water Planning Group is requesting two variances:

- Use of the Corpus Christi Water Supply Model to evaluate water availability for the Corpus Christi Regional Supply System. All other run-of-river rights will be evaluated using the Nueces WAM Run #3 to estimate availability.
- Use of Safe Yield with 75,000 ac-ft reserve and City's reservoir operations policy to evaluate surface water supplies for the Corpus Christi Regional Supply System. All other rights will be evaluated using firm yield.

Background and supporting information related to this request is provided in Attachment 1 supplement.

<sup>&</sup>lt;sup>1</sup> 31 Texas Administrative Code (TAC) §§ 357.10(14) and 357.32(c)

3. Was this request submitted in a previous planning cycle? If yes, please indicate which cycle and note how it is different, if at all, from the previous request?

### Yes

The previous Region N Plans (2006, 2011, 2016, and 2021 Plans) have received hydrologic variances to use the Corpus Christi Water Supply Model (formerly NUBAY model) and use of safe yield to evaluate water availability for the Corpus Christi Regional Supply System.

4. Are you requesting to extend the period of record beyond the current applicable WAM hydrologic period? If yes, please describe the proposed methodology. Indicate whether you believe there is a new drought of record in the basin.

Yes

## **Existing Supply**

A new drought of record for the Corpus Christi Regional Water Supply System from 2007 to 2013 was identified in the 2021 Plan. The single lowest inflow year to the Lake Corpus Christi/ Choke Canyon Reservoir system occurred in 2011. The minimum 2 year (twenty-four month) inflow to the LCC/CCR system during this most recent decade occurred from October 2010 to September 2012 at an inflow of 124,000 acft, which is 32% less than the minimum 2 year inflow to the Lake Corpus Christi/ Choke Canyon system in the Nueces Basin in the 1990's of 183,000 acft that occurred from August 1994 to July 1996 and was the driver of the previous drought of record.

The hydrology update used the same methodology that was used to develop the Nueces WAM hydrology.

5. Are you requesting to use a reservoir safe yield? If yes, please describe in detail how the safe yield would be calculated and defined, which reservoir(s) it would apply to, and why the modification is needed or preferrable for drought planning purposes.

Yes

### **Existing Supply**

Similar to the 2021 Plan cycle, the annual safe yield assumes 75,000 ac-ft remains in CCR/LCC system storage during the critical month of the drought of record. The Coastal Bend Regional Water Planning Group requests use of safe yield for supply planning, instead of the firm yield with zero remaining storage during historical drought of record conditions, due to historical trends showing increasing severity with each successive drought as described in Chapter 1.10. Background and supporting information related to this request is provided in Attachment 1 supplement.

6. Are you requesting to use a reservoir yield other than firm yield or safe yield? If yes, please describe, in a bulleted list, each modification requested including how the alternative yield was calculated, which reservoir(s) it applies to, and why the modification is needed or preferrable for drought planning purposes. Examples of alternative reservoir yield analyses may include using an alternative reservoir level, conditional reliability, or other special reservoir operations.

No

Choose an item.

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7. Are you requesting to use a different model (such as a RiverWare or Excel-based models) than RUN 3 of the applicable TCEQ WAM? If yes, please describe the model being considered including how it incorporates water rights and prior appropriation and how it is more conservative than RUN 3 of the applicable TCEQ WAM.

Yes

## **Existing Supply**

The Corpus Christi Water Supply Model (CCWSM) focuses on the operations of the CCR/LCC/Lake Texana/MRP Phase II System and is capable of simulating this system subject to the City of Corpus Christi's Phased Operations Plan and the 2001 Agreed Order governing freshwater inflow passage to the Nueces Estuary. It includes water rights and simulates availability through prior appropriation subject to hydrologic availability.

8. Are you requesting to use a modified TCEQ WAM? If yes, please describe in a bulleted list all modifications in detail including all specific changes to the WAM and whether the modified WAM is more conservative than the TCEQ WAM RUN 3. Examples of WAM modifications may include adding subordination agreements, contracts, updated water rights, modified spring flows, updated lake evaporation, updated sedimentation<sup>2</sup>, system or reservoir operations, or special operational procedures into the WAM.

No

Choose an item.

Click or tap here to enter text.

<sup>&</sup>lt;sup>2</sup> Updating anticipated sedimentation rates does not require a hydrologic variance under 31 TAC § 357.10(14). The Technical Memorandum will require providing details regarding the sedimentation methodology utilized. Please consider providing that information with this request.

9. Are you requesting to include return flows in the modeling? If yes, are you doing so to model an indirect reuse water management strategy (WMS)? Please provide complete details regarding the proposed methodology for determining reuse WMS availability.

No

**Existing Supply** 

10. Are any of the requested Hydrologic Variances also planned to be used by another region for the same basin? If yes, please indicate the other Region. Please indicate if unknown.

No

Click or tap here to enter text.

11. Please describe any other variance requests not captured on this checklist or add any other information regarding the variance requests on this checklist.

Click or tap here to enter text.

## Attachment 1-

# Hydrologic variance request to use the Corpus Christi Regional Water Supply Model for regional water supply availability instead of TCEQ Water Availability Model (WAM) Run # 3

At the Coastal Bend Meeting on May 18, 2023, the Coastal Bend (Region N) Regional Water Planning Group approved the submittal of a hydrologic variance request to the TWDB Executive Administrator to (1) use the Corpus Christi Water Supply Model to evaluate water availability for the Corpus Christi Regional Water Supply System and (2) use of safe yield with 75,000 acft reserve and the City's reservoir operating policies to calculate water availability from the Corpus Christi Regional Water Supply System for the 2026 Region N Water Plan.

## <u>Request for hydrologic variance for use of the Corpus Christi Water Supply Model to Evaluate Water</u> <u>Availability for the Corpus Christi Regional Water Supply System-</u>

**Background:** The TWDB guidelines<sup>1</sup> state that planning groups must use the unmodified TCEQ Water Availability Model (WAM) Run # 3 for determining current and future water supplies *unless a hydrologic variance approval is granted by the TWDB Executive Administrator for variations in modeling requirements.* TCEQ's WAM Run # 3, includes all water rights at full authorizations and no return flows.

The TCEQ Nueces Basin WAM Run # 3 does not accurately simulate the City's system operation policy within permit allowances nor does it reflect all aspects of the TCEQ 2001 Agreed Order. Furthermore, the hydrology ends in 1996 and doesn't cover the recent drought of record. WAM Run #3 is not reasonable for drought planning purposes or to reflect conditions expected in near term, actual drought conditions.

The previous Region N Plans (2006, 2011, 2016, and 2021 Plans) have received hydrologic variances to use the Corpus Christi Water Supply Model (formerly NUBAY model) to evaluate water availability for the Corpus Christi Regional Supply System. Since the original model developed in 1990, the Texas Water Development Board, U.S. Army Corp of Engineers, and City of Corpus Christi have made significant investments in the Corpus Christi Water Supply Model to simulate water availability for the regional water supply system, which spans multiple river basins.

All other run-of-river rights will be evaluated using the Nueces WAM Run #3 to estimate yields.

## <u>Supporting Information for Use of the Corpus Christi Water Supply Model to Evaluate Water</u> <u>Availability for the Corpus Christi Regional Water Supply System:</u>

All previous Region N Plans have used the Corpus Christi Water Supply Model (formerly NUBAY model) to determine water availability for the City's Regional Water Supply System.

The Corpus Christi Regional Water Supply Model includes:

- Hydrology through 2015 for total model period of 82 years (1934 to 2015), to include the most recent drought of record
- New TWDB volumetric survey data for Lake Corpus Christi and Choke Canyon Reservoir with updated sedimentation rates

<sup>&</sup>lt;sup>1</sup> First Amended General Guidelines for Development of the 2026 Regional Water Plans, October 2022.

- Integrated recent hydrology for Lake Texana and Colorado River (for Mary Rhodes Phase II supplies)
- Includes all provisions of the TCEQ 2001 Agreed Order
- Simulates current contracted supplies from Lake Texana, which includes the LNRA exercised callback for local water users in Jackson County pursuant to City of Corpus Christi contract terms
- Operational flexibility to exercise water supply calls on the Garwood water right on the Colorado River at a variable rate according to diversion rate and priority date of the rights and based on MRP Phase II system capacities.
- Other updates

## <u>Request for hydrologic variance for use of Safe Yield of 75,000 acft reserve and City's Reservoir</u> <u>Operations Policy to Evaluate Surface Water Supplies for the Corpus Christi Regional Supply System-</u>

**<u>Background</u>**: The TWDB guidelines<sup>2</sup> state that planning groups must use firm yield *unless a hydrologic* variance approval is granted by the TWDB Executive Administrator for variations in modeling requirements.

Firm yield is defined as the maximum water volume a reservoir can provide each year under a repeat of a drought of record, using anticipated sedimentation rates and assuming all senior rights are utilized and no return flows are included such that the reservoir storage draws down to <u>zero</u> or some other defined dead pool storage with no shortages.

Safe yield is a provision for climate and growth uncertainty and has been used in previous Region N plans and City of Corpus Christi water planning. Safe yield is defined as the maximum amount of supply that can be diverted from a reservoir system such that a *specified reserve amount remains* in storage during the modeled critical drought. A description of the City's existing reservoir operating policy and safe yield assumptions from the 2021 Region N Plan is included in Section 3.1: <a href="https://www.twdb.texas.gov/waterplanning/rwp/plans/2021/N/RegionN\_2021RWP.pdf?d=3050.70000">https://www.twdb.texas.gov/waterplanning/rwp/plans/2021/N/RegionN\_2021RWP.pdf?d=3050.70000</a> 00029802

The previous Region N Plans (2006, 2011, and 2016) have received hydrologic variances to use safe yield and the City's reservoir system operations policy for water supply planning for the Corpus Christi Regional Water Supply System.

Supporting Information for Use of Safe Yield and City's Reservoir Operations Policy: The City's regional water supply system includes water supplies from the Nueces, Lavaca/Navidad, and Colorado basins. The City operates the reservoirs as a system and receives roughly half of its water supplies to meet current water demands from the Choke Canyon Reservoir/Lake Corpus Christi system and the other half from the east (i.e. Mary Rhodes Pipeline supplies originating from Lake Texana and Colorado River). The City operates their reservoirs and run-of-the-river rights on the Colorado River within the four corners of their permits and in conjunction with their contract with Lavaca Navidad River Authority (LNRA) for Lake Texana supplies, with the aggregated system yield being greater than individual reservoir yields when supplies are considered separately.

<sup>&</sup>lt;sup>2</sup> First Amended General Guidelines for Fifth Cycle of Regional Water Plan Development, April 2017.

A significant amount of water supplied to the region is provided by Lake Texana in Region P and the Colorado River (Mary Rhodes Phase II) in Region K which helps mitigate drought impacts in the Nueces Basin. For example, on September 27, 2013, while the combined storage in Choke Canyon Reservoir and Lake Corpus Christi was at 33% of capacity, storage in Lake Texana was at 81.9% of capacity. Often, drought occurs at different times and at different levels of severity in the Nueces, Lavaca-Navidad, and Colorado River basins. This frequent situation gives the City flexibility in operating the CCR/LCC/Texana/MRP Phase II system to optimize water supplies<sup>3</sup>. The DOR for the Lavaca-Navidad and Colorado River basins are December 1952 to April 1957 and October 2007 to April 2015, respectively.<sup>4</sup>

The City's regional water supply system is prone to severe drought. Average annual inflows to Lake Corpus Christi and Choke Canyon System is lower with each successive drought. With the Corpus Christi Water Supply Model update in the 2021 Region N Plan cycle to include recent hydrology through 2015, a new drought of record was confirmed. In terms of severity and duration, the drought from 2007-2013 is considered to be a new DOR for the Region N planning area. Although the LCC/CCR system has not yet returned to full capacity, rainfall events in October 2013 and June 2015 ameliorated the severity of drought during this time and replenished stored water levels. The combined CCR/LCC system has not been full since September 2007 and system storage as of February 2020 is approximately 52%, hence, it is important to understand that estimates of firm or safe yield reported herein represent maximums.

The 2021 Region N Plan indicated that the critical drawdown was 73 months from October 2007 to October 2013 during which time the reservoirs went from full to a minimum storage of 32.6% before inflows restored lake storage. From 2010-2012, inflows into LCC and CCR were 32% less (or 59,000 ac-ft less) than the inflows from 1994-1996 into LCC and CCR. For additional comparison, the 2010-2012 inflows were almost 50% less (or 98,200 ac-ft less) than the inflow into LCC and CCR from 1954-1956. Annual inflow to the CCR/LCC System for the model period from 1934 to 2015 is shown in Figure 1. The 3-year moving average shows the severity and duration of the recent drought relative to other droughts since the 1930s, and includes the recovery in 2013 and 2015.

In the previous 2021 Region N Plan, the Corpus Christi Water Supply Model was used to estimate firm yield of the system for 2020 and 2070 sediment conditions, which is the maximum amount of water volume that can be provided under a repeat of drought of record (DOR) conditions assuming that all senior water rights will be totally utilized and all permit conditions met. In this case, this is the yield that would be available such that reservoir active storage would be equal to zero during the worst month of the drought of record. Figure 2 shows a storage trace for the LCC/CCR system under a hypothetical 2020 firm yield demand of 194,000 ac-ft/yr. The critical month of the DOR is September 2013.

Figure 3 shows the CCR/LCC system trace based safe yield to maintain a reserve in storage during the worst, historical drought of record that occurred from 2007 to (at least) 2013. The storage trace for the LCC/CCR system is similar to Figure 2 except that a 75,000 ac-ft reserve is maintained during the critical month of the DOR (September 2013) resulting in a 2020 safe yield of 178,000 ac-ft/yr. The safe yield maintains the 75,000 ac-ft reserve through the planning period (2020-2070) and declines to 167,000 ac-ft/yr by 2070 due to sedimentation.

<sup>&</sup>lt;sup>3</sup> Subject to permitted or contracted supply amounts.

<sup>&</sup>lt;sup>4</sup> <u>https://www.lcra.org/download/2020-water-management-plan/?wpdmdl=11923</u> p. 3-2

Safe yield supply from the City's Regional Water Supply System is requested to serve as the basis of the needs analysis for entities relying on surface water supplies from the City and the City's wholesale customers (San Patricio Municipal Water District and South Texas Water Authority).



Figure 1 Annual Natural Inflow to the CCR/LCC System



Figure 2 CCR/LCC System Storage Trace- 2020 Firm Yield of 194,000 ac-ft/yr

Page 4 of 5



*Figure Error!* No text of specified style in document..1. CCR/LCC System Storage Trace- 2020 Safe Yield of 178,000 ac-ft/yr

то:	Michele Foss, Regional Water Planner, Regional Water Planning
FROM:	Nelun Fernando, Ph.D., Manager, Water Availability
DATE:	January 3, 2024
SUBJECT:	Recommendations on Region N's hydrologic variance request for the 2026 Regional Water Plan

This memorandum summarizes my review recommendations on the hydrologic variance request submitted for assessing current surface water availability in Region N's 2026 regional water plan.

1. Use the Corpus Christi Water Supply Model to evaluate existing supplies from Lake Corpus Christi and Choke Canyon Reservoir for the Corpus Christi Regional Water Supply System.

### Recommendation: Approve request.

*Justification:* The Corpus Christi Water Supply Model includes the operations of Choke Canyon Reservoir, Lake Corpus Christi, accounts for contracted supplies from Lake Texana, and the Mary Rose Pipeline Phase II System, and is capable of simulating the system's performance subject to the City of Corpus Christi's Phased Operations Plan and the 2001 Agreed Order governing freshwater inflow passage to the Nueces Estuary. Furthermore, the variance request was implemented in the 2006, 2011, 2016, and 2021 regional water plans.

2. Use of Safe Yield with 75,000 ac-ft reserve to evaluate existing surface water supplies for the Corpus Christi Regional Supply System.

#### Recommendation: Approve request.

*Justification:* The use of safe yield allows reservoir operators to maintain a supply in reserve and is a means of extending supply in the event of a drought worse than the drought of record. Furthermore, the same variance request was implemented in the 2021 regional water plan.

3. Use of hydrology updated through 2015, which includes the new drought of record from 2007 through 2013, to evaluate existing supply.

#### Recommendation: Approve request.

*Justification:* The 2021 Region N water plan identified 2007 through 2013 as a new drought of record within the Nueces River Basin. The extended hydrology covers the new drought of record.

#### Additional resources for consideration:

The TWDB has developed auxiliary extended naturalized flows and reservoir evaporation through December 2021 for the Nueces Water Availability Model (WAM). Extended naturalized flow data are available at <a href="https://www.twdb.texas.gov/surfacewater/data/ExtendedNatFlow/Data/CRUN3">https://www.twdb.texas.gov/surfacewater/data/ExtendedNatFlow/Data/CRUN3</a> extended.txt and net reservoir evaporation data are available at

https://www.twdb.texas.gov/surfacewater/data/ExtendedNatFlow/Data/CRUN3\_eva.txt.



P.O. Box 13231, 1700 N. Congress Ave. Austin, TX 78711-3231, www.twdb.texas.gov Phone (512) 463-7847, Fax (512) 475-2053

January 8, 2024

Messrs. Scotty Bledsoe and Pancho Hubert Co-Chairs Coastal Bend (Region N) Regional Water Planning Group c/o Nueces River Authority 500 IH69, Suite 805 Robstown, TX 78380

Dear Messrs. Bledsoe and Hubert:

I have reviewed your request dated December 5, 2023, for approval of alternative water supply assumptions to be used in determining existing surface water availability. This letter confirms that the TWDB approves the following assumptions:

- 1. Use of the Corpus Christi Water Supply Model, including extending the hydrology through 2015, to evaluate existing supplies from Lake Corpus Christi and Choke Canyon Reservoir for the Corpus Christi Regional Water Supply System.
- 2. Use of Safe Yield with 75,000 ac-ft reserve to evaluate existing surface water supplies for the Corpus Christi Regional Supply System.

Although the TWDB approves the use of a safe yield with 75,000 ac-ft reserve for developing estimates of current water supplies, firm yield for each reservoir must still be reported to TWDB in the online planning database and plan documents.

For the purpose of evaluating potentially feasible water management strategies, the TCEQ WAM Run 3 is to be used, unless a separate hydrologic variance for water management strategy availability is submitted and approved by the TWDB.

While the TWDB authorizes these modification to evaluate existing water supplies for development of the 2026 Region N Coastal Bend RWP, it is the responsibility of the RWPG to ensure that the resulting estimates of water availability are reasonable for drought planning purposes and will reflect conditions expected in the event of actual drought conditions; and in all other regards will be evaluated in accordance with the most recent version of regional water planning contract Exhibit C, *General Guidelines for Development of the 2026 Regional Water Plans.* 

Please do not hesitate to contact Michele Foss of our Regional Water Planning staff at 512-463-9225 or mfoss@twdb.texas.gov if you have any questions.

Board Members

Leading the state's efforts in ensuring a secure water future for Texas

Our Mission

Messrs. Scotty Bledsoe and Pancho Hubert January 8, 2024 Page 2

Sincerely,

Matt Nelson Deputy Executive Administrator

c: Travis Pruski, Nueces River Authority Kristi Shaw, HDR Michele Foss, Water Supply Planning Sarah Lee, Water Supply Planning Nelun Fernando, Ph.D., Surface Water