REGION H
Water Planning Group

WATER MANAGEMENT STRATEGY COMMITTEE MEETING MATERIALS

October 24, 2023

Common Region H Terms and Conversion Factors

List of Abbreviations

CRU	Collective Reporting Unit
DCP	Drought Contingency Plan
DFC	Desired Future Condition
DOR	Drought of Record
EA	Executive Administrator
EPA	Environmental Protection Agency
FWSD	Fresh Water Supply District
GAM	Groundwater Availability Model
GCD	Groundwater Conservation District
GMA	Groundwater Management Area
GPCD	Gallons Per Capita Per Day
GRP	Groundwater Reduction Plan
IFR	Infrastructure Finance Report
IPP	Initially Prepared Plan
MAG	Modeled Available Groundwater
MPC	Master Planned Community
MUD	Municipal Utility District
MWP	Major Water Provider
PCS	Plumbing Code Savings
PDSI	Palmer Drought Severity Index
PWS	Public Water Supply
RFPG	Regional Flood Planning Group
RHWPG	Region H Water Planning Group
ROR	Run-of-River
RWP	Regional Water Plan
RWPA	Regional Water Planning Area
RWPG	Regional Water Planning Group
SWIFT	State Water Implementation Fund for Texas
SWP	State Water Plan
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks and Wildlife Department
TWC	Texas Water Code
TWDB	Texas Water Development Board
UCM	Unified Costing Model
URS	Unique Reservoir Site
USS	Unique Stream Segment
WAM	Water Availability Model
WCID	Water Control and Improvement District
WCP	Water Conservation Plan
WMS	Water Management Strategy
WRAP	Water Rights Analysis Package
WUG	Water User Group
WWP	Wholesale Water Provider

Water Measurements

1 acre-foot (AF) = 43,560 cubic feet = 325,851 gallons

1 acre-foot per year (ac-ft/yr) = 325,851 gallons per year = 893 gallons per day

1 gallon per minute (gpm) = 1,440 gallons per day = 1.6 ac-ft/yr

1 million gallons per day (mgd) = 1,000,000 gallons per day = 1,120 ac-ft/yr

Region H Water Planning Group
Water Management Strategy Committee
10:00 AM Tuesday
October 24, 2023
Freese and Nichols Houston Office
10497 Town and Country Way, Suite 500, Houston, TX 77024

AGENDA

1. Call to order.
2. Introductions.
3. Review and approve minutes of October 30, 2019 meeting.
4. **Receive public comments on specific issues related to agenda items 5 through 11**. (Public comments limited to 3 minutes per speaker)
5. Discuss Committee activities and schedule.
6. Discuss Water Management Strategy (WMS) recommendations from the Region H 2021 Regional Water Plan (RWP).
7. Discuss the process for identifying potentially feasible WMS for the 2026 RWP and consider making recommendations to the Region H Water Planning Group (RHWPG).
8. Discuss the process for evaluating potentially feasible WMS for the 2026 RWP and consider making recommendations to the RHWPG.
9. Discuss the process for identifying infeasible WMS and consider making recommendations to the RHWPG.
10. Discuss preliminary scope and budget for requesting Task 5 funds for the initiation of detailed investigation into potential water management strategies and consider making recommendations to the RHWPG.
11. Discuss additional potential water management strategy focus areas for the 2026 RWP.
12. **Receive public comments**. (Public comments limited to 3 minutes per speaker)
13. Adjourn.

Persons with disabilities who plan to attend this meeting and would like to request auxiliary aids or services are requested to contact Philip Taucer at (713) 600-6835 at least three business days prior to the meeting so that appropriate arrangements can be made.

Agenda Item 3

Review and approve minutes of October 30, 2019 meeting.

REGION H
Water Planning Group

REGION H WATER PLANNING GROUP
WATER MANAGEMENT STRATEGY COMMITTEE
MINUTES OF COMMITTEE MEETING
OCTOBER 30, 2019

A meeting of the Region H Water Planning Group (RHWPG) Water Management Strategy (WMS) Committee was held at 2:00 p.m., October 30, 2019, at the Freese and Nichols Houston office. A notice of said meeting was posted as required by law.

MEMBERS PRESENT: Brad Brunett, Glenn Lord, John Bartos, Jace Houston, Mike Turco, Ivan Langford

DESIGNATED ALTERNATES: Glenn Clingenpeel for Kevin Ward, Jun Chang for Jimmie Schindewolf, Veronica Osegueda for Yvonne Forrest

MEMBERS ABSENT: Robert Bruner

NON-VOTING MEMBERS PRESENT: Robert Istre, Mark Evans

NON-MEMBERS PRESENT: Ken Kramer (Sierra Club), Paul Nelson (The Woodlands G.R.E.E.N.), Shane Porter (SJRA)

CONSULTANT TEAM: Jason Afinowicz, Philip Taucer, Courtney Corso, Jordan Skipwith, Chris Drabek

1. CALL TO ORDER

The meeting was called to order at 2:00 p.m.

2. INTRODUCTIONS

Committee members were welcomed to the meeting.

3. REVIEW AND APPROVE MINUTES OF SEPTEMBER 4, 2019 WMS COMMITTEE MEETING.

The committee passed a motion to approve the minutes of the WMS Committee meeting on September 4, 2019.

4. RECEIVE PUBLIC COMMENTS ON SPECIFIC ISSUES RELATED TO AGENDA ITEMS 5 THROUGH 8.

There were no public comments.

5. DISCUSS COMMITTEE ACTIVITIES AND SCHEDULE.

Mr. Taucer provided an update to the 2021 Regional Water Plan schedule referencing various due dates. The Committee briefly discussed the anticipated schedule for review of draft project scoring for the prioritization analysis.

6. DISCUSS WATER MANAGEMENT STRATEGY RECOMMENDATIONS AND PROCESS FROM THE REGION H 2021 REGIONAL WATER PLAN.

Mr. Taucer provided an update on the progress of water management strategy (WMS) analyses for the 2021 Region H RWP, including projected needs, challenges in meeting future agricultural demand under drought conditions., the data structure for strategies, and key strategy and project recommendations.

7. RECEIVE UPDATE FROM CONSULTANT TEAM REGARDING DROUGHT MANAGEMENT AS A POTENTIAL WATER MANAGEMENT STRATEGY AND CONSIDER MAKING RECOMMENDATIONS TO THE REGION H WATER PLANNING GROUP

Mr. Taucer provided an update on analyses regarding the potential for potential drought contingency planning to be included as a WMS in the Plan. Key elements of the discussion included the treatment of drought contingency in other Regional Water Plans, challenges in estimating drought plan efficacy and compliance, potential water savings and cost, and limiting factors for reflecting a drought management WMS in the context of the RWP data. It was noted that drought management savings were partially captured in the historic data used to estimated demand for the RWP, and that the Region's needs are driven in large part by growth rather than weather. After discussion, the Committee recommended that drought management be included in the RWP as a considered strategy. The Committee also recommended that Chapter 7 of the RWP include documentation of the issues discussed and support for vigorous drought planning.

8. DISCUSS OPTIONS FOR UTILIZATION OF REMAINING UNALLOCATED TASK 5 FUNDS AND CONSIDER MAKING RECOMMENDATIONS TO THE REGION H WATER PLANNING GROUP.

Mr. Taucer explained the existing funding allocations and remaining funds available for Task 5A and presented the Committee with the option to allocate the remaining funding towards efforts after the submittal of the Initially Prepared Plan (IPP). These efforts may include the review of input from stakeholders to adjust recommendations in the IPP or to add new projects not identified as of the IPP. The Committee recommended that the Planning Group approve a notice-to-proceed request for post-Initially Prepared Plan adjustment of strategies and other strategies in response to stakeholder feedback.

9. RECEIVE PUBLIC COMMENTS.

There were no public comments.

10. ADJOURN

Without objection, the meeting was adjourned at 4:00 p.m.

Agenda Item 5

Discuss Committee activities and schedule.

REGION H
Water Planning Group

Agenda Item 5
Committee Activities and Schedule

Near-Term (1-2 meetings)

- Identifying and evaluating potential WMS
- Analyzing potentially infeasible WMS
- Establishing focus areas for WMS studies

Before IPP (1-3 meetings)

- Consideration of WMS safety factor
- Guidance during development of studies
- Policy and agency recommendations

After IPP (0-2 meetings)

- Assessing post-IPP changes
- Lessons learned /thoughts for next cycle

Agenda Item 5
Committee Activities and Schedule

*Region H accepts public comment throughout the planning cycle and at each RWPG and committee meeting.

Agenda Item 5
Committee Activities and Schedule

Date	Scheduled Events/Tasks
10/2023	WMS Committee Meeting
12/2023	RWPG Meeting
02/2024	RWPG Meeting
03/2024	Technical Memorandum due to TWDB
06/2024	Amendments for Infeasible WMS
03/2025	IPP Due
10/2025	Final RWP Due

Agenda Item 6

Discuss Water Management Strategy (WMS) recommendations from the Region H 2021 Regional Water Plan (RWP).

REGION H
Water Planning Group

Agenda Item 6
WMS in 2021 Region H RWP

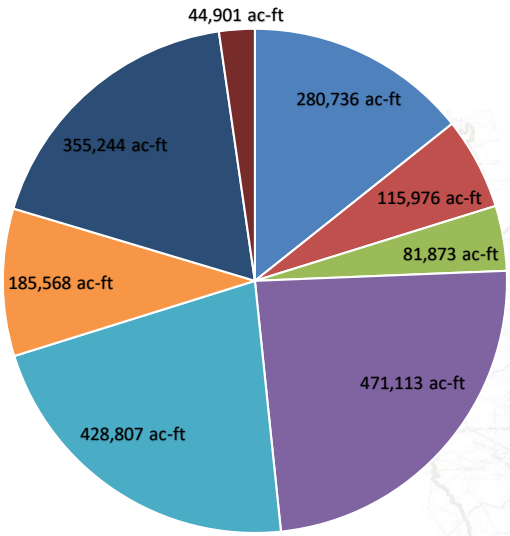
Early RWPs

Now

Agenda Item 6
WMS in 2021 Region H RWP

2070 WMS Allocations

- Conservation
- Contracts
- Groundwater
- Surface Water
- Reuse
- Treatment and Transmission
- GRPs
- Other

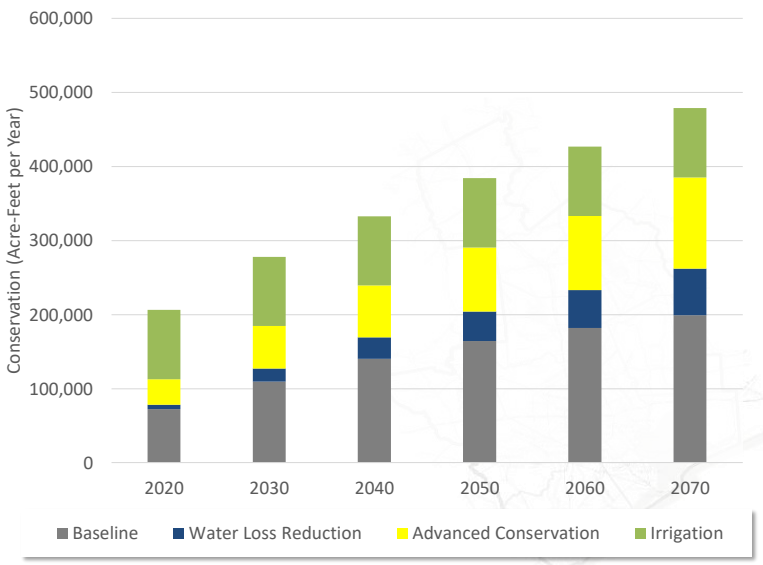


Agenda Item 6
WMS in 2021 Region H RWP

WMS and Projects

Conservation

- Irrigation
- Municipal
  - Baseline
  - Advanced
  - Water Loss Reduction



Agenda Item 6
WMS in 2021 Region H RWP

WMS and Projects

Groundwater

- Traditional
  - Expanded Use of Groundwater
  - WUG-Specified Expansions
- Newer approaches
  - Aquifer Storage and Recovery
  - Brackish Groundwater

Surface Water

- Reservoirs and Expansions
- Water Rights and System Operation
- Seawater Desalination

Agenda Item 6
WMS in 2021 Region H RWP

WMS and Projects

Reuse

- Direct
  - Reclamation for Municipal Irrigation
- Indirect
  - Municipal projects
  - Industrial reuse

Treatment and Transmission

- Treatment
  - BWA, COH, GCWA, Pearland, and others
  - NEWPP
- Transmission
  - GRP transmission projects
  - BWA and CWA projects
  - IBTs

Agenda Item 6
WMS in 2021 Region H RWP

WMS and Projects

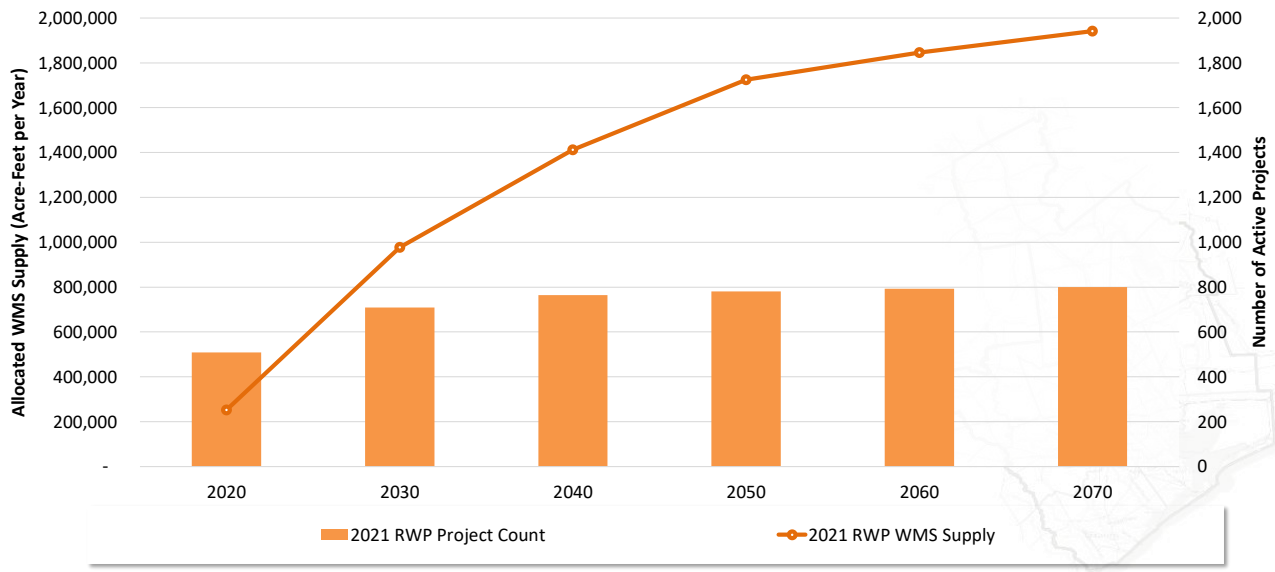
Groundwater Reduction Plans

- WWPs and WUGs in
  - Fort Bend County
  - Harris County
  - Montgomery County

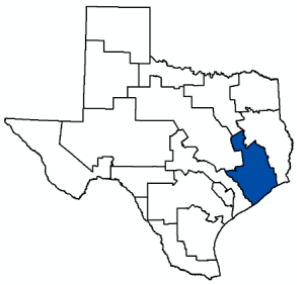
Other

- Brazos Saltwater Barrier
- GCWA Shannon PS Expansion
- Municipal Drought Management
- New and Expanded Contracts

Agenda Item 6
WMS in 2021 Region H RWP



Agenda Item 6
WMS in 2021 Region H RWP



$80 billion
plan implementation

$110 - $177 billion lost annually
598,200 – 1.3 million jobs lost

$20 billion
plan implementation

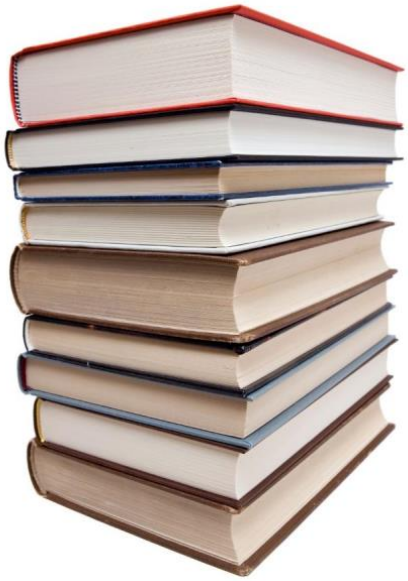
$5.2 - $21.7 billion lost annually
28,800 – 148,200 jobs lost

Agenda Item 7

Discuss the process for identifying potentially feasible WMS for the 2026 RWP and consider making recommendations to the Region H Water Planning Group (RHWPG).

REGION H
Water Planning Group

Agenda Item 7
Identifying Potentially Feasible WMS

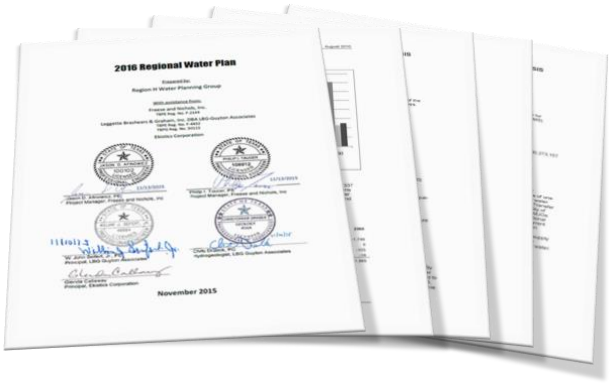


- 31 TAC 357.12(b)
  - Public meeting to determine the process for identifying potentially feasible WMSs;
  - Document process and public input
  - *List all possible potentially feasible WMSs.*

Agenda Item 7
Identifying Potentially Feasible WMS

- Flexibility in methods of identifying and selecting WMS
- Criteria determined by RWPG
- Group should receive public comment on proposed process

Agenda Item 7
Identifying Potentially Feasible WMS



- Three-step ID process
  - Strategies from prior RWP
  - New from scope development
  - Request for inclusion
- Some added later in process
- Statutory categories (20+)

Agenda Item 7
Identifying Potentially Feasible WMS

- Thoughts?
- Recommendations to RWPG?

Region H

DRAFT Potentially Feasible WMS and Key Projects

Conservation

Industrial Conservation[1]
Irrigation Conservation
Advanced Municipal Conservation
Water Loss Reduction

Conveyance

BWA Transmission Expansion
CHCRWA Transmission and Internal Distribution
City of Houston GRP Transmission
COH, NHCRWA, and CHCRWA Shared Transmission
CWA Transmission Expansion
East Texas Transfer
GCWA Industrial Raw Water Line
Lake Livingston to SJRA Transfer
LNVA Neches-Trinity Basin Interconnect
NFBWA Phase 2 Distribution Segments
NHCRWA Distribution Expansion
NHCRWA Transmission Lines
Southeast Transmission Line Improvements
Surfside Beach Supply Infrastructure
WHCRWA Distribution Expansion
WHCRWA/NFBWA Transmission Line

Groundwater Development

Aquifer Storage and Recovery
Brackish Groundwater Development and Groundwater Blending
BWA Brackish Groundwater Development
City of Houston Area 2 Groundwater Infrastructure
Expanded Use of Groundwater
Forestar Houston County Project[1]
Forestar Liberty County Project[1]
GCWA Backup Well Development
Groveton Groundwater Expansion
SJRA Catahoula Aquifer Supplies

Groundwater Reduction Plans

CHCRWA GRP
City of Houston GRP
City of Missouri City GRP
City of Richmond GRP
City of Rosenberg GRP
City of Sugar Land IWRP
Fort Bend County MUD 25 GRP
Fort Bend County WC&ID No. 2 GRP
Montgomery County MUDs 8 and 9 GRP
NFBWA GRP
NHCRWA GRP

Porter SUD Joint GRP
River Plantation and East Plantation Joint GRP
SJRA GRP
WHCRWA GRP

Reuse

City of Houston Reuse
City of Pearland Reuse
Galveston County Industrial Reuse
NFBWA Member District Reuse
NHCRWA Member District Reuse
San Jacinto Basin Regional Return Flows
Wastewater Reclamation for Industry[1]
Wastewater Reclamation for Municipal Irrigation
Westwood Shores MUD Reuse

Surface Water Development

Allens Creek Reservoir
BRA System Operation Permit
Dow Reservoir and Pump Station Expansion
Freeport Seawater Desalination
Lake Somerville Augmentation[1]
Lone Star Lake[1]
Manvel Supply Expansion
NRG Cedar Bayou Desalination

Treatment

BWA Conventional Treatment Expansion
City of Houston Treatment Expansion
City of Houston West Water Purification Plant
GCWA Western Galveston County Treatment Expansion
Harris County MUD 50 Surface Water Treatment Plant[2]
Northeast Water Purification Plant Expansion
Pearland Surface Water Treatment Plant
SEWPP Additional Module

Other

Brazos Saltwater Barrier
GCWA Shannon Pump Station Expansion
Municipal Drought Management[1]
New and Expanded Contracts

Notes:

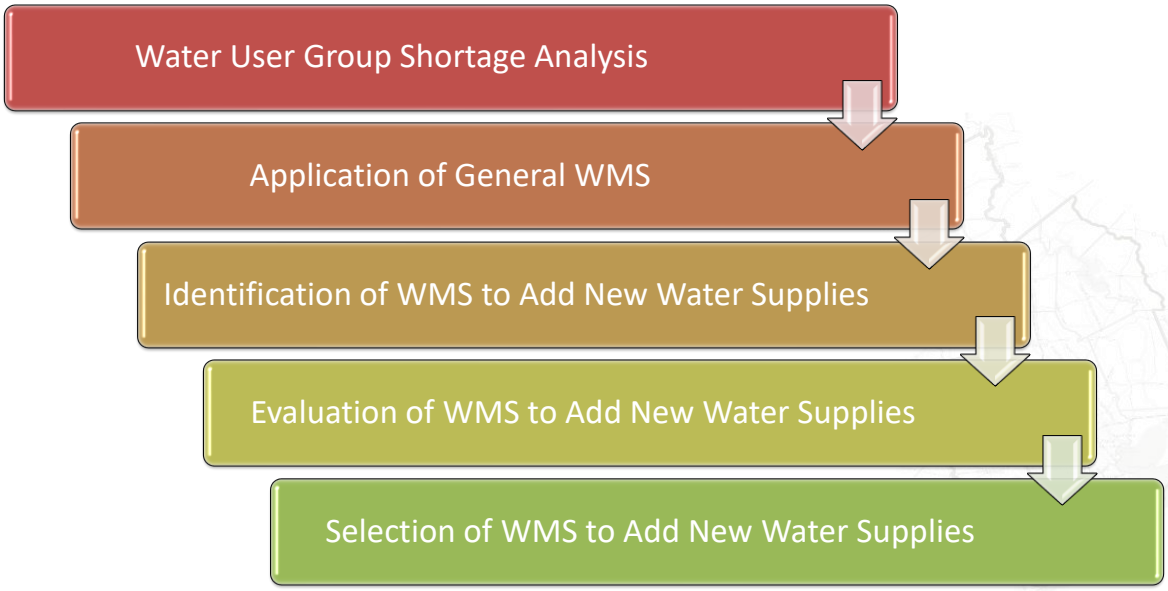
1. *Considered but not recommended in the Region H 2021 RWP.*
2. *Requested through the 2022 Region H WUG survey.*

Agenda Item 8

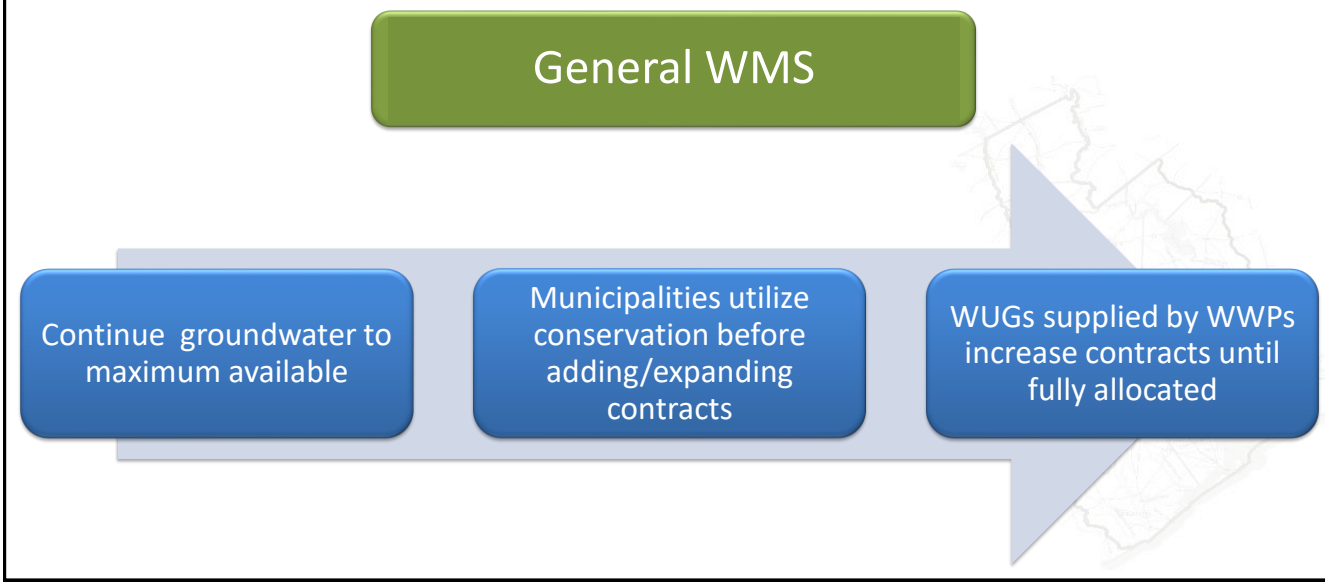
Discuss the process for evaluating potentially feasible WMS for the 2026 RWP and consider making recommendations to the RHWPG.

REGION H
Water Planning Group

Agenda Item 8
Evaluating Potentially Feasible WMS

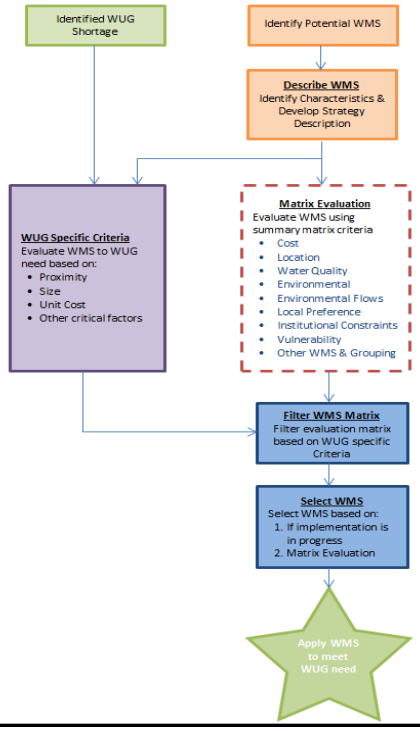


Agenda Item 8
Evaluating Potentially Feasible WMS



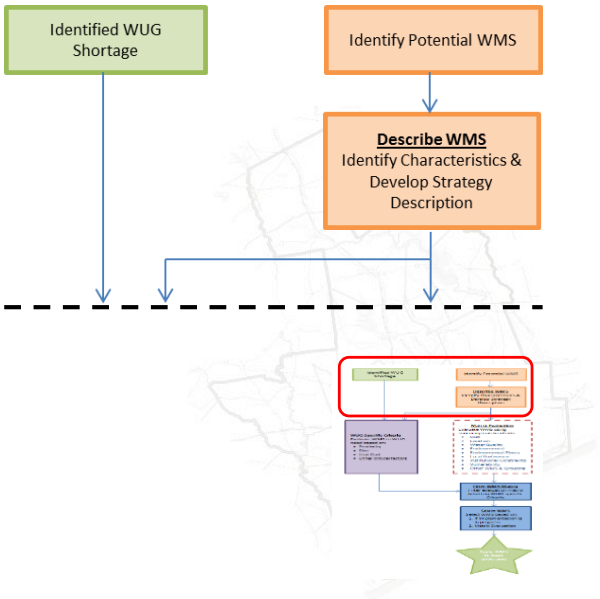
Agenda Item 8
Evaluating Potentially Feasible WMS

- Two-track process
- Follows application of generalized WMS
- More consistent method
- Major steps
  - Identification/definition of needs and WMS
  - WUG-centered evaluation
  - WMS-centered evaluation
  - Filtering, selection, and application



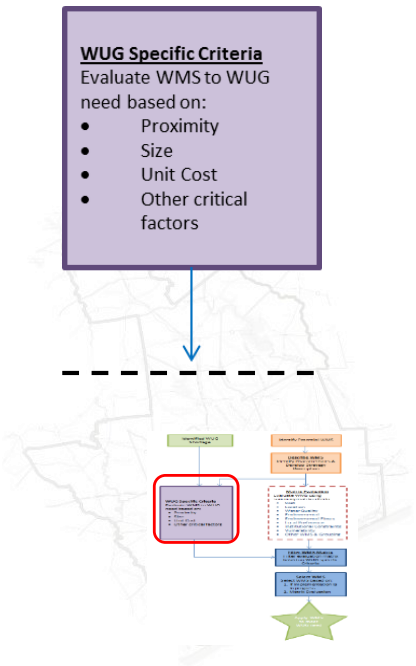
Agenda Item 8
Evaluating Potentially Feasible WMS

- Inputs into evaluation
- Identified shortages
- List of identified potentially-feasible WMS
- Must develop detailed WMS descriptions before evaluating



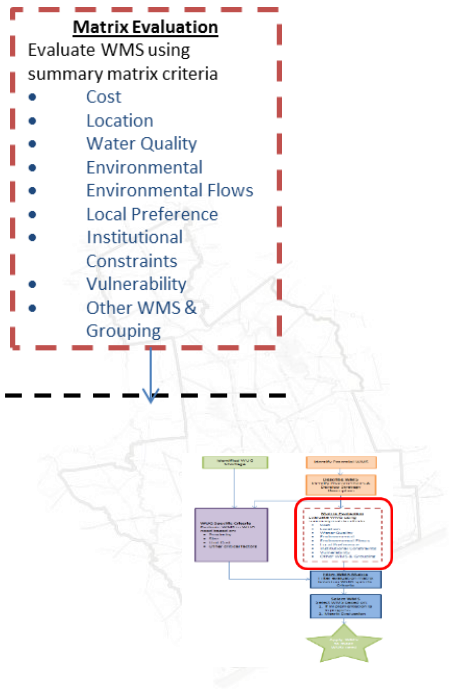
Agenda Item 8
Evaluating Potentially Feasible WMS

- First WMS evaluation phase focused on specific WUG need
- WUG-specific questions
  - Reasonable proximity to need?
  - Right-sized or easily combined?
  - Timing of WMS vs. need
  - Unit cost supportable?
  - Known flaws?



Agenda Item 8
Evaluating Potentially Feasible WMS

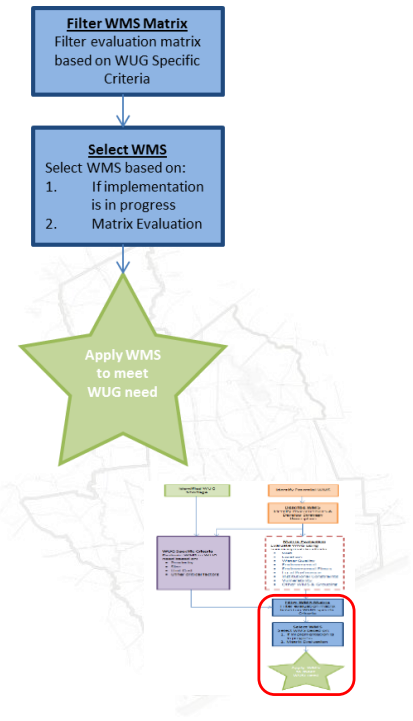
- Second evaluation phase focused on WMS
- Evaluation based on criteria matrix
- Utilizes a scoring system from 1 to 5 for each criterion
  - Allows more range per criterion
  - Avoids unnecessary bias from +/- system



Category	Rating Criteria				
	1	2	3	4	5
Cost	>$1000/ac-ft	$750 to $1000/ac-ft	$500 to $750/ac-ft	$250 to $500/ac-ft	<$250/ac-ft
Location	IBT required, long distance or outside Region H.	IBT & Conveyance required for use to meet significant needs.	IBT required for some need centers. Conveyance required.	Some conveyance required to need centers.	No IBT. Relatively near centers of high demand.
Water Quality	Quality reduced significantly.	Quality reduced.	No known quality issues.	Quality improved.	Existing problems are reduced.
Environmental Land & Habitat	Significant issues and opposition.	Some issues and opposition.	Impacts can be mitigated. Limited concerns.	Minimal mitigation or concerns.	Limited or no known impacts.
Impacts on Environmental Flows	Significantly reduces instream or B&E flows.	Reduces instream or B&E flows.	No impact.	Increases instream or B&E flows.	Significantly increases instream or B&E flows.
Local Preference	No local support. Significant opposition.	Minimal local support. Some opposition.	Some local support. Limited opposition.	Local support. Minimal opposition.	Widespread local support. Multi-use benefits likely.
Institutional Constraints / Risk of Implementability	Permits opposed. Significant property required.	Some permit opposition. Some property acquisition necessary.	Permits expected with minimal problems. Property available.	Application in progress. Property acquired or under acquisition.	Permits issued. Facilities or land owned. Water available.
Vulnerability from natural and man-made disasters	Significant risk	Substantial risk	Moderate risk	Slight risk	Minimal risk
Impacts on Other WMS	Significant negative impacts.	Some negative impacts and/or little grouping.	No impact.	Some positive impacts.	Significant positive impacts.

Agenda Item 8
Evaluating Potentially Feasible WMS

- Matrix filtered for each WUG need – list of WMS available to that WUG
- Strategies in progress selected first
- If need remains, select additional WMS based on matrix
- Apply results to plan and database



Agenda Item 8
Evaluating Potentially Feasible WMS

- Thoughts?

- Recommendations to RWPG?

MEMORANDUM

FREESE AND NICHOLS

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10497 Town and Country Way, Suite 500 + Houston, Texas 77024 + 713-600-6800 + FAX 817-735-7491 www.freese.com

TO: Region H Water Management Strategy Committee

FROM: Philip Taucer

SUBJECT: DRAFT Potential Water Management Strategy (WMS) Identification and Selection Methodology

DATE: 10/15/2023

PROJECT: SJR21660

Introduction

Pursuant to 31 TAC 357.12(b), the RHWPG is required to prepare a summary of its process for identifying and selecting Water Management Strategies (WMS) for development of the 2026 Regional Water Plan (RWP). This process shall be presented to the public for comment at a public meeting of the Region H Water Planning Group (RHWPG). The methodology described below proposes a WMS selection methodology for consideration and adoption by the RHWPG. This evaluation methodology will also be applied by the RHWPG to evaluate WMS Projects which, for the purposes of regional planning, refer to specific infrastructure used to increase or manage water supplies. It is recognized that WMS may include one or more projects that can each be scored individually in the selection process.

Potential WMS are defined based on a determination of needs developed from a comparison of projected demands and existing supplies. These strategies are to be analyzed at the Major Water Provider (MWP), Wholesale Water Provider (WWP) or Water User Group (WUG) level. A detailed technical memorandum will be prepared for each of the management strategies and projects that are selected and considered to be overarching key strategies or projects.

Shortage Analysis

The regional water planning process begins with identifying current and projected future water demands. After water demands are identified for all WUGs, water supplies available to Region H are identified and allocated to WUGs and WWPs based on current usage and contracts. By matching the supplies and the demands, projected surpluses and shortages are determined. MWP supplies and contracts are also reviewed to determine their respective surplus or need during the planning period.

Application of General WMS

The selection of WMS begins with the identification of certain “general WMS” that are readily available. Such alternatives can provide simple, cost-effective solutions to shortage without the development of new, major water projects. These strategies include the use of groundwater where available, the expansion or extension of existing contracts for water supplies between WUGs and WWPs, and the reduction of demand through water conservation.

In evaluating the general WMS, the RHWPG makes three assumptions. First, the RHWPG assumes that every municipal WUG with a projected shortage would, where feasible, utilize conservation before

developing additional groundwater supplies, seeking out or increasing a WWP contract, or pursuing any other strategies to increase supply. This is pursuant to the language of 31 TAC 357.34(g).

Secondly, WUGs would continue to develop groundwater until it is fully utilized. This is based upon the observed pattern of development in the region, where the Gulf Coast Aquifer is available in all of the southern counties. The supply of groundwater will not be allocated in excess of regulations set forth by subsidence or groundwater conservation districts or other entities that have regulatory power over the consumption of groundwater.

Finally, those WUGs currently receiving water from WWPs would be able to increase their contract amounts until the WWP supplies were fully allocated. This assumes the use of existing supplies conveyed through existing infrastructure wherever possible.

Identification of Potential WMS

Potential WMS will include, but are not limited to, the strategies considered in the 2021 RWP. These strategies, plus additional strategies formulated since the completion of the 2021 RWP, are included as *Attachment 1* to this memorandum.

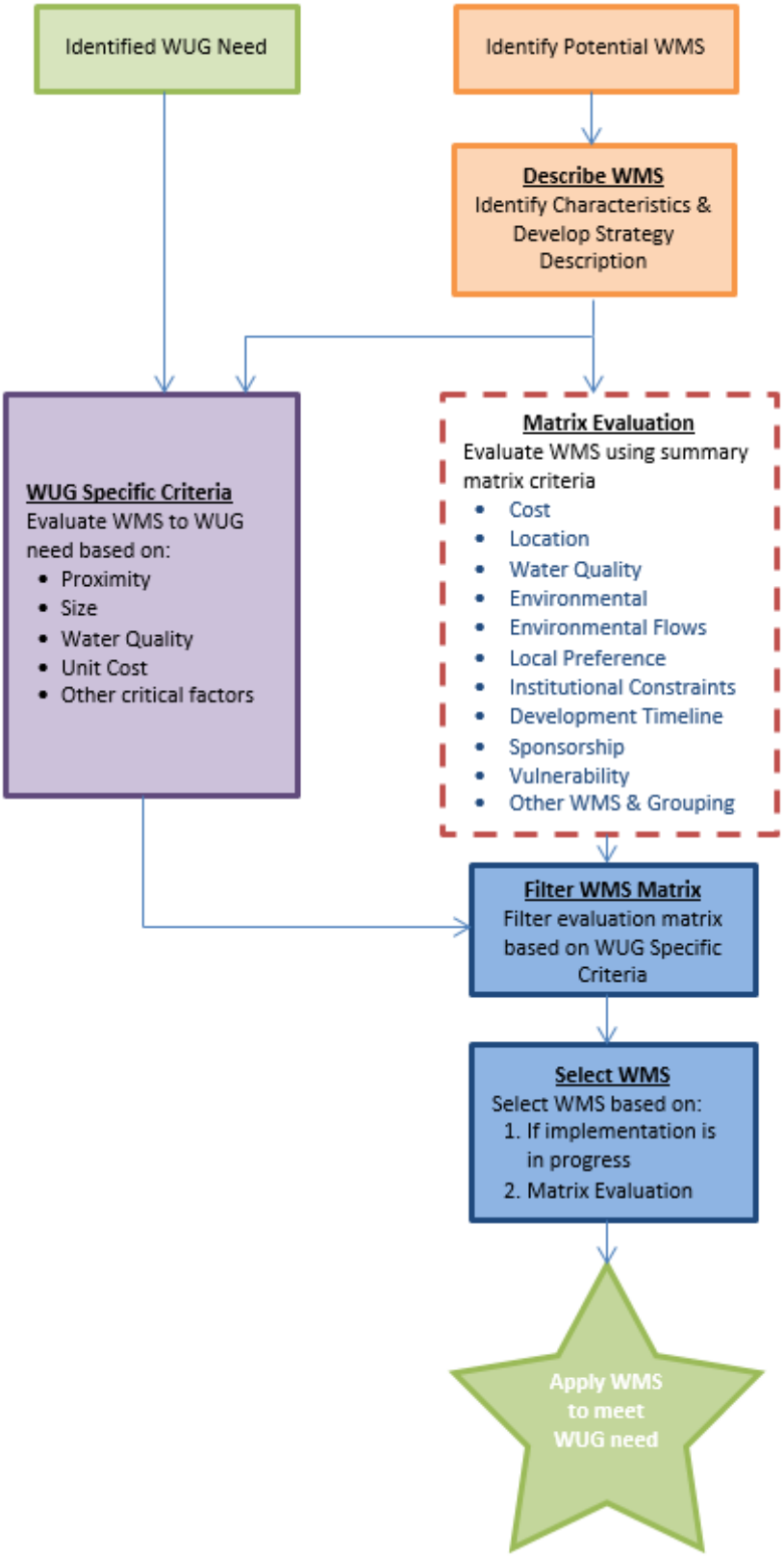
WMS Evaluation and Selection Process

For the 2026 RWP, a dual-phased WMS selection process is proposed. Inputs into the dual-phase process include the identified WUG shortages (after the application of General WMS) and the potential WMS. The output is the application of WMS(s) to meet a WUG need. *Figure 1* presents a flow chart of the proposed WMS selection process.

Prior to the dual phases, the proposed strategies will be described in detail. Within the dual phases, the first phase (the WUG Specific Criteria phase) focuses on the WUG, as it aims to evaluate the WMS for a specific WUG need. During this phase, questions such as the following must be addressed for a given WMS to be considered acceptable to apply to meet a WUG need:

- Is the strategy within reasonable proximity to location of water need?
- Is the strategy right-sized or easily paired with another WMS?
- Is the expected water quality produced by the strategy significantly different from existing water quality at the WUG?
- Is the unit cost (and capital if no WWP is present) supportable by the target WUG?
- Has any other flaw relating to the WMS and WUG been identified?

Figure 1. Region H WMS Selection Methodology Process



The second phase (the Matrix Evaluation phase) focuses on the evaluation of the WMS. In this phase, each WMS will be evaluated based on the matrix criteria presented in *Table 1*. Each WMS will be given a score from one to five for each analysis criterion, and the phase will ultimately develop a matrix of rated WMS. The analysis criteria include the following:

- Cost – Evaluates the unit cost of the water produced by the strategy.
- Location – Evaluates the degree of interbasin transfer or conveyance required to move the water to significant demand centers within Region H.
- Water Quality – Evaluates the strategy's impact on water quality.
- Environmental Land & Habitat – Evaluates the degree of environmental land impacts and the degree of public opposition expected by the strategy.
- Environmental Flows – Evaluates the degree of impact to environmental flows to bays and estuaries. This evaluation is independent of the application of adopted environmental flow standards that are required to be enforced upon new water right appropriations. Projects that are found to reduce flows are not necessarily in violation of these standards just as compliance with the adopted standards does not mean a project will not reduce instream flows.
- Local Preference – Evaluates the local preference and likelihood for public support or opposition created by the strategy.
- Institutional Constraints/Risk of Implementability – Evaluates the potential for factors such as permitting and land acquisition to affect the strategy.
- Development Timeline – Evaluates the amount of time necessary to implement the strategy.
- Sponsorship – Evaluates whether a sponsor has been identified and is committed to implementing the strategy.
- Vulnerability – Evaluates the risk from natural or man-made disasters such as hurricanes, climate change, or terrorism to impact the strategy's ability to deliver water.
- Impacts on Other WMS – Evaluates the likelihood of the strategy to impact other WMS and the potential for the strategy to be applied in coordination with other WMS.

After the dual-phase description, the emphasis of the methodology shifts to the identification and selection of WMS to meet the needs of a particular WUG of interest. To accomplish this process, the evaluation matrix is filtered for each WUG need, such that all WMS that meet the WUG Specific Criteria are available for selection.

Selection of the WMS will first occur by selecting any strategies that are already in progress. This is intended to make the planning process parallel with ongoing developments within Region H while still allowing for thorough quantitative evaluation of each strategy under consideration. Subsequent selections of WMS will be made, as needed, based on the filtered Matrix Evaluation. After WMS selection, the selected WMS are applied to meet WUG needs.

Table 1. WMS Evaluation Matrix

Category	Rating Criteria				
	1	2	3	4	5
Cost	>$1,000/ac-ft	$750 to $1,000/ac-ft	$500 to $750/ac-ft	$250 to $500/ac-ft	<$250/ac-ft
Location	IBT required, long distance or outside Region H.	IBT & Conveyance required for use to meet significant needs.	IBT required for some need centers. Conveyance required.	Some conveyance required to need centers.	No IBT required. Relatively near centers of high demand.
Water Quality	Quality of supply is reduced significantly.	Quality of supply is reduced.	No known water quality issues.	Quality of supply is improved.	Existing water quality problems are reduced.
Environmental Land & Habitat	Significant environmental issues and opposition.	Some environmental issues and opposition.	Environmental impacts can be mitigated. Limited concerns.	Minimal mitigation of impacts needed. Minimal concerns.	Limited or no known impacts.
Impacts on Environmental Flows	Significantly reduces instream or B&E flows.	Reduces instream or B&E flows.	No impact.	Increases instream or B&E flows.	Significantly increases instream or B&E flows.
Local Preference	No local support. Significant opposition.	Minimal local support. Some opposition.	Some local support. Limited opposition.	Local support. Minimal opposition.	Widespread local support. Multi-use benefits likely.
Institutional Constraints / Risk of Implementability	Permits opposed. Significant property required.	Some permit opposition. Some property acquisition necessary.	Permits expected with minimal problems. Property available.	Permit application in progress. Property acquired or under acquisition.	Permits issued. Facilities or land owned. Water available.
Development Timeline	>35 years	25-35 years	15-25 years	5-15 years	0-5 years
Sponsorship	No sponsor readily identifiable.	Sponsor identifiable, but uncommitted.	Sponsor(s) identified; commitment level uncertain.	Sponsor(s) are identified and committed to strategy.	Sponsors identified and strategy is in development.
Vulnerability	Significant risk from natural and man-made disasters.	Substantial risk from natural and man-made disasters.	Moderate risk from natural and man-made disasters.	Slight risk from natural and man-made disasters.	Minimal risk from natural and man-made disasters.
Impacts on Other Management Strategies	Significant negative impacts.	Some negative impacts and/or little chance of grouping.	No impact.	Some positive impacts, potential synergistic effects.	Significant positive impacts, synergy achieved.

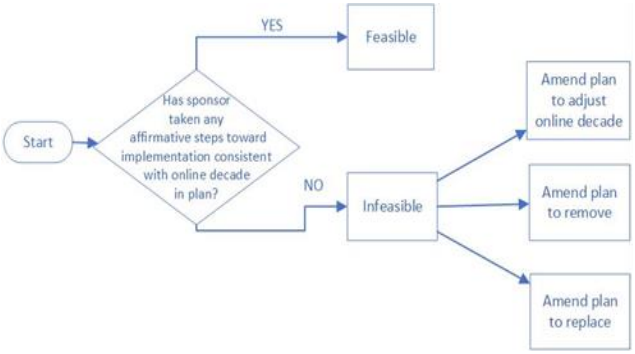
Agenda Item 9

Discuss the process for identifying infeasible WMS and consider making recommendations to the RHWPG.

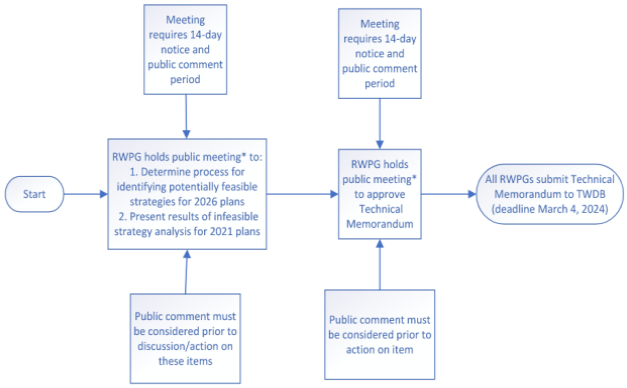
REGION H
Water Planning Group

Agenda Item 9
Identifying Potentially Infeasible WMS

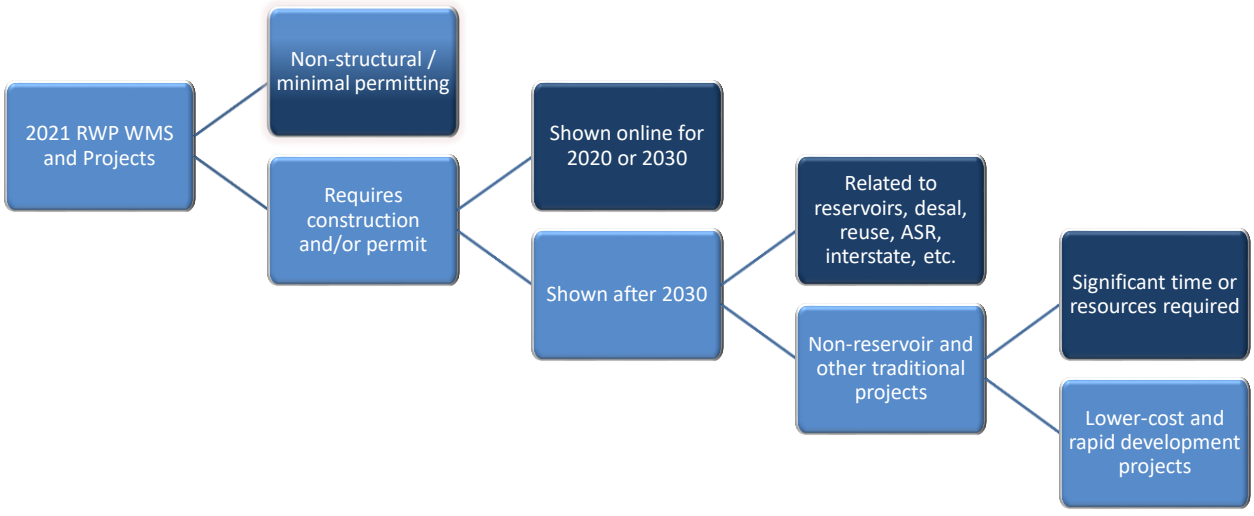
Mechanics



Public Process



Agenda Item 9
Identifying Potentially Infeasible WMS



Agenda Item 9
Identifying Potentially Infeasible WMS

Extra Challenges

- Documenting actions
  - Finding data
  - What is / isn't "close enough"
- Aggregate entities
  - County-Other
  - Industry
  - Agriculture

Some Things That Help

- Sponsor involvement
  - Key strategies
  - Regional projects
- Ongoing supply management programs
  - GRPs
  - Integrated planning

Agenda Item 9
Identifying Potentially Infeasible WMS (Strategies)

- Major Reservoir and Desalination
  - Allens Creek
  - Dow Reservoir and Pump Station Expansion
  - Freeport Desalination
- Irrigation Conservation
  - Aggregate WUG
  - Implementation at farm scale
  - Funding by owner or operator
  - Rapid implementation

Agenda Item 9
Identifying Potentially Infeasible WMS (Strategies)

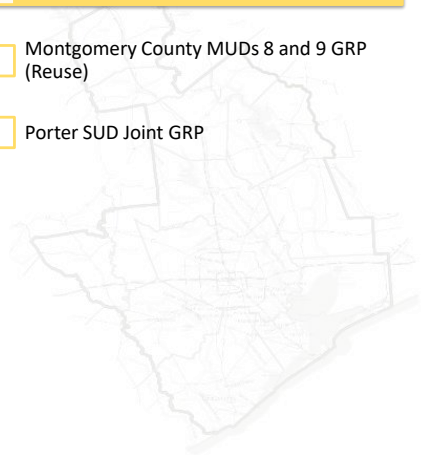
- Advanced Municipal Conservation
  - Non-structural demand management
  - Many have existing WCP
  - Gradual implementation
  - Limited initial savings
- Water Loss Reduction
  - Some physical components
  - Many have existing WCP
  - Gradual implementation
  - Limited initial savings
  - Generally utility operating budget rather than distinct project appropriation

Agenda Item 9
Identifying Potentially Infeasible WMS (Strategies)

Construction initiated or contracts awarded	Part of ongoing Inf. program	Funding secured
Brackish Groundwater Supplies	Fort Bend WCID 2, Missouri City, and Rosenberg GRPs	Groveton Groundwater Expansion
Expanded Use of Groundwater	GCWA Galveston County Raw Water Expansion	Surfside Beach Supply Enhancement
New/Expanded Contract with City of Houston		Westwood Shores MUD Reuse
Regional Water Authority Member District Reuse		
Richmond GRP (Reuse)		

Agenda Item 9
Identifying Potentially Infeasible WMS (Strategies)

Action on approval, pilot study, ordinance, or permit	2020 volumes not Inf.-dependent	Coordination Ongoing
City of Pearland Reuse	Industrial Supply Reallocation	Montgomery County MUDs 8 and 9 GRP (Reuse)
Manvel Supply Expansion (Groundwater)	Montgomery County MUDs 8 and 9 GRP (Catahoula)	Porter SUD Joint GRP
	New/Expanded Contracts with GCWA LNVA, and SJRA	
	Other BRA System Operation Supplies	
	SJRA GRP and Reuse Supplies for Manufacturing	

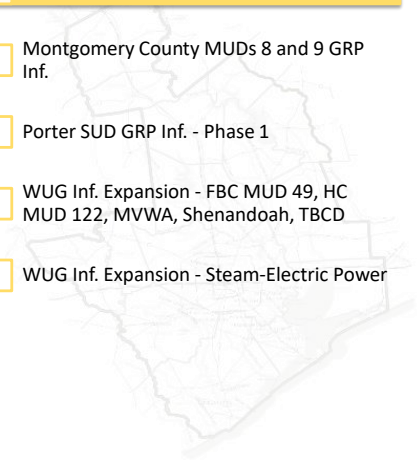


Agenda Item 9
Identifying Potentially Infeasible WMS (Projects)

Construction initiated or contracts awarded	Part of ongoing Inf. program	Funding secured
Regional Water Authority Member District Reuse Inf.	GCWA Industrial Raw Water Line	Groveton Well Development
Richmond Reuse Inf.	WUG Inf. Expansion - The Woodlands - Phase 1	Surfside Beach Supply Inf.
WUG Inf. Expansion (Brackish) - Dobbin-Plantersville WSC - Phase 1		Westwood Shores Reuse Inf.

Agenda Item 9
Identifying Potentially Infeasible WMS (Projects)

Action on approval, pilot study, ordinance, or permit	Aggregate WUG, Some implementation in county	Coordination Ongoing
Manvel Supply Expansion - Groundwater Development	WUG Inf. Expansion (Groundwater) – County-Other, Agriculture, and Industry	Montgomery County MUDs 8 and 9 GRP Inf.
Pearland Reuse Inf.	WUG Inf. Expansion – County-Other, Agriculture, and Industry	Porter SUD GRP Inf. - Phase 1
		WUG Inf. Expansion - FBC MUD 49, HC MUD 122, MVWA, Shenandoah, TBCD
		WUG Inf. Expansion - Steam-Electric Power



Agenda Item 9
Identifying Potentially Infeasible WMS

- Thoughts?
- Recommendations to RWPG?

WMS	Type	WMS Sponsor and/or select WUG Beneficiary List	2021 RWP Allocated Strategy Supply (ac-ft)			Assessment	WMS Identified as Infeasible? (Y/N)
			2,020	2,030	2,040		
Advanced Municipal Conservation	Municipal conservation	Multiple WUGs	34,537	57,356	69,935	Non-structural municipal demand management WMS. Many entities have an existing Water Conservation Plan.	N
Water Loss Reduction	Municipal conservation	Multiple WUGs	5,892	17,612	28,916	WMS reflects gradual implementation over time. Measures may be implemented as part of municipal budgets and regular operational response, rather than as a distinct entity construction project requiring separate appropriation. Many WUGs have a Water Conservation Plan, which by agency requirement includes consideration of loss reduction.	N
Irrigation Conservation	Agricultural conservation	Multiple WUGs	93,562	93,562	93,562	WMS reflects recommendation for aggregate Irrigation WUG. Not expected to be funded through water supplier programs or require formal actions by boards. Would be implemented by individual farmers or landowners, who could implement measures over a reasonably short timescale if desired.	N
Additional Supply from GCWA	Other surface water	Gulf Coast Water Authority	7,013	7,029	7,044	Reflects utilization of existing supply to meet need of customers, with 2020 WMS volumes not dependent on infrastructure at the strategy level.	N
Brackish Groundwater Supplies	Groundwater wells and other	Dobbin Plantersville WSC	258	432	683	Entity has developed additional groundwater capacity. Target formation is different than 2021 RWP assumption, but should be noted that the newer adjusted availability estimate is not capable of being reflected in 2021 RWP.	N
Brackish Groundwater Supplies	Groundwater wells and other	Panorama Village	33	48	48	The portion of the Brackish Groundwater Supplies associated with Panorama Village utilizes the WUG's existing infrastructure.	N
City of Houston GRP - Brazos Supplies	New major reservoir	Houston	-	-	34,875	Allens Creek project is proceeding.	N
City of Pearland Reuse	Other direct reuse	Pearland	314	1,154	1,154	The City of Pearland has approved expansion of the Barry Rose Water Reclamation Facility.	N
Dow Reservoir and Pump Station Expansion	New major reservoir	Brazosport Water Authority; Dow Inc	-	80,000	80,000	Dow Harris Reservoir project is proceeding.	N
Expanded Use of Groundwater, Chambers County	Groundwater wells and other	Manufacturing, Chambers	2,775	3,500	3,500	WMS reflects non-municipal groundwater expansion. TWDB well databases indicate additional groundwater wells have been drilled for industrial use in Chambers County subsequent to the 2021 RWP.	N
Expanded Use of Groundwater, Liberty County	Groundwater wells and other	Irrigation, Liberty; Livestock, Liberty	5,375	5,375	5,375	WMS reflects non-municipal groundwater expansion. TWDB well databases indicate additional groundwater wells have been drilled for agriculture in Liberty County subsequent to the 2021 RWP.	N
Expanded Use of Groundwater, Waller County	Groundwater wells and other	County-Other, Waller	975	975	2,050	WMS reflects groundwater expansion for non-WUG PWS and domestic use from small wells. TWDB well databases indicate additional groundwater wells have been drilled for domestic in Waller County subsequent to the 2021 RWP.	N
Fort Bend WCID 2 GRP - Surface Water	Other surface water	Fort Bend County WCID 2	7	29	51	The WMS reflects an ongoing effort by the sponsor to implement alternative source to groundwater to meet Subsidence District regulations. Sponsor's Board has continued to actively move the associated treatment capacity project forward.	N
Freeport Seawater Desalination	Seawater desalination	Dow Inc	-	-	11,200	Project is viable for the development timeline shown in the RWP.	N
GCWA Galveston County Raw Water Expansion	Other surface water	Gulf Coast Water Authority	2,816	2,427	2,260	GCWA has recently completed the expanded pump station facilities which are part of the infrastructure required for the WMS.	N
GCWA Galveston County Raw Water Expansion	Other surface water	Gulf Coast Water Authority; Manufacturing, Galveston	17,518	17,953	18,176	GCWA has recently completed the expanded pump station facilities which are part of the infrastructure required for the WMS.	N
Groveton Groundwater Expansion	Groundwater wells and other	Groveton	242	242	242	The City of Groveton has received TWDB funding for the project through the Drinking Water State Revolving Fund.	N
Industrial Supply Reallocation	Other surface water	NRG	21,772	27,812	27,812	Reflects utilization of existing supply to meet non-municipal needs, with WMS volumes not dependent on infrastructure at the strategy level.	N
Manvel Supply Expansion - Groundwater	Groundwater wells and other	Manvel	331	331	-	Manvel has included near-term groundwater expansion in a recent ordinance related to infrastructure development.	N
Missouri City GRP - Reuse	Other direct reuse	Missouri City	2,405	3,164	4,092	Reflects utilization of existing supply to meet need of customers, with 2020 WMS volumes not dependent on infrastructure at the strategy level. Infrastructure relates to later expansions of deliverable supply, with limited infrastructure required for 2030.	N
Missouri City GRP - Surface Water Expansion	Other surface water	Missouri City	7	276	318	Reflects utilization of existing supply to meet need of customers, with 2020 WMS volumes not dependent on infrastructure at the strategy level. Infrastructure for the WMS is part of an ongoing program by Missouri City, which has already developed extensive infrastructure for groundwater reduction.	N

WMS	Type	WMS Sponsor and/or select WUG Beneficiary List	2021 RWP Allocated Strategy Supply (ac-ft)			Assessment	WMS Identified as Infeasible? (Y/N)
			2,020	2,030	2,040		
Missouri City GRP - Surface Water Expansion	Other surface water	Missouri City	64	115	114	Reflects utilization of existing supply to meet need of customers, with 2020 WMS volumes not dependent on infrastructure at the strategy level. Infrastructure for the WMS is part of an ongoing program by Missouri City, which has already developed extensive infrastructure for groundwater reduction.	N
Montgomery County MUDs 8 and 9 GRP - Catahoula	Groundwater wells and other	Montgomery County MUD 9	682	682	682	The WMS reflects increased use of brackish groundwater supply by leveraging existing well infrastructure.	N
Montgomery County MUDs 8 and 9 GRP - Reuse	Indirect reuse	Montgomery County MUD 8; Montgomery County MUD 9	1,680	1,680	1,680	Coordination with project sponsor is ongoing.	TBD
New/Expanded Contract with BRA	New major reservoir	Brazos River Authority	-	-	-	Allens Creek project is proceeding.	N
New/Expanded Contract with City of Houston	Other surface water	Houston	10,826	13,330	16,278	Reflects utilization of existing supply to meet need of existing and/or new customers. The WMS is dependent on the expansion of the City of Houston Northeast Water Purification Plant project. Construction for the project has started.	N
New/Expanded Contract with GCWA	Other surface water	Gulf Coast Water Authority	675	3,675	2,589	Reflects utilization of existing supply to meet need of customers, with 2020 WMS volumes not dependent on infrastructure at the strategy level. Infrastructure relates to later expansions of deliverable supply.	N
New/Expanded Contract with GCWA	Other surface water	Gulf Coast Water Authority	1,256	2,092	2,092	Reflects utilization of existing supply to meet need of customers, with 2020 WMS volumes not dependent on infrastructure at the strategy level. Infrastructure relates to later expansions of deliverable supply.	N
New/Expanded Contract with GCWA - Allens Creek	New major reservoir	Brazos River Authority	-	-	13,440	Allens Creek project is proceeding.	N
New/Expanded Contract With LNVA - Reallocation	Other surface water	Lower Neches Valley Authority	416	712	1,044	Reflects utilization of existing supply to meet need of customers, with WMS volumes not dependent on infrastructure at the strategy level.	N
New/Expanded Contract with SJRA	Other surface water	San Jacinto River Authority	404	1,033	1,167	Reflects utilization of existing supply to meet need of customers, with 2020 WMS volumes not dependent on infrastructure at the strategy level. Infrastructure relates to later expansions of deliverable supply, with limited infrastructure required for 2030.	N
NFBWA Member District Reuse	Other direct reuse	North Fort Bend Water Authority	3,816	3,816	3,816	Additional districts within NFBWA have implemented and/or increased reuse.	N
NHCRWA Member District Reuse	Other direct reuse	North Harris County Regional Water Authority	300	300	300	Additional districts within NHCRWA have implemented and/or increased reuse.	N
Other BRA System Operation Supplies	Other surface water	Dow Inc; Irrigation, Waller; Manufacturing, Brazoria	19,431	19,431	19,431	Reflects utilization of existing supply to meet non-municipal needs, with WMS volumes not dependent on infrastructure at the strategy level.	N
Porter SUD Joint GRP	Indirect reuse	Conroe	1,680	2,240	2,240	Coordination with project sponsor is ongoing.	TBD
Richmond GRP - New/Expanded Contract with BRA	New major reservoir	Brazos River Authority	-	-	-	Allens Creek project is proceeding.	N
Richmond GRP - Reuse	Other direct reuse	Richmond	458	458	458	Richmond has executed a reuse agreement with Fort Bend MUD 215 and awarded a contract for the expansion of the reclaimed water system at the Regional Wastewater Treatment Plant .	N
Rosenberg GRP - Groundwater Offset	Conjunctive use	Rosenberg - Unassigned Water Volumes	30	46	43	The City of Rosenberg is continuing its Groundwater Reduction Plan efforts and has developed GRP infrastructure.	N
SJRA GRP - Groundwater Offset	Conjunctive use	San Jacinto River Authority	4,586	16,548	14,151	Reflects utilization and reallocation of existing supply to meet non-municipal needs, with WMS volumes not dependent on infrastructure at the strategy level.	N
SJRA GRP - Participant Surface Water	Other surface water	San Jacinto River Authority	1,567	7,305	8,351	Reflects utilization of existing supply to meet need of customers, with 2020 WMS volumes not dependent on infrastructure at the strategy level. Infrastructure relates to later expansions of deliverable supply, with limited infrastructure required for 2030.	N
SJRA Reuse Supplies for Manufacturing	Indirect reuse	San Jacinto River Authority	2,749	3,550	4,308	Reflects utilization of existing supply to meet need of customers, with WMS volumes not dependent on infrastructure at the strategy level.	N
SJRA Reuse Supplies for Manufacturing - Regional Return Flows	Indirect reuse	San Jacinto River Authority	4,655	17,350	17,654	WMS volumes not dependent on infrastructure at the strategy level. Application filed.	N

WMS	Type	WMS Sponsor and/or select WUG Beneficiary List	2021 RWP Allocated Strategy Supply (ac-ft)			Assessment	WMS Identified as Infeasible? (Y/N)
			2,020	2,030	2,040		
Surfside Beach Supply Enhancement	Other surface water	Freeport	323	323	323	Surfside beach has contracted with Freeport for the associated source water. Contracts have been awarded for construction and a loan has been secured from TWDB.	N
Westwood Shores MUD Reuse	Other direct reuse	Westwood Shores MUD	150	150	150	Westwood Shores MUD has procured project funding support through the State Revolving Fund.	N

WMS Project	Related WMS Types	WMS Project Sponsor and/or select WUG Beneficiary List	2021 RWP Allocated Strategy Supply (ac-ft)			Assessment	WMS Project Identified as Infeasible? (Y/N)
			2,020	2,030	2,040		
Advanced Municipal Conservation	Municipal conservation	Multiple WUGs	34,537	57,356	69,935	Non-structural municipal demand management WMS. Many entities have an existing Water Conservation Plan.	N
Water Loss Reduction	Municipal conservation	Multiple WUGs	5,892	17,612	28,916	WMS reflects gradual implementation over time. Measures may be implemented as part of municipal budgets and regular operational response, rather than as a distinct entity construction project requiring separate appropriation. Many WUGs have a Water Conservation Plan, which by agency requirement includes consideration of loss reduction.	N
Irrigation Conservation	Agricultural conservation	Multiple WUGs	93,562	93,562	93,562	WMS reflects recommendation for aggregate Irrigation WUG. Not expected to be funded through water supplier programs or require formal actions by boards. Would be implemented by individual farmers or landowners, who could implement measures over a reasonably short timescale if desired.	N
Allens Creek Reservoir	New major reservoir	Brazos River Authority; Houston	-	-	48,315	Allens Creek project is proceeding.	N
Dow Reservoir and Pump Station Expansion	New major reservoir	Dow Inc; Brazosport Water Authority	-	80,000	80,000	Dow Harris Reservoir project is proceeding.	N
Freeport Seawater Desalination	Seawater desalination	Dow Inc	-	-	11,200	Project is viable for the development timeline shown in the RWP.	N
GCWA Industrial Raw Water Line	New major reservoir;Other surface water	Gulf Coast Water Authority	20,334	20,380	33,876	GCWA has recently completed the expanded pump station facilities which are part of the infrastructure required for the transfer.	N
Groveton Well Development	Groundwater wells and other	Groveton	242	242	242	The City of Groveton has received TWDB funding for the project through the Drinking Water State Revolving Fund.	N
Manvel Supply Expansion - Groundwater Development	Groundwater wells and other	Manvel	331	331	-	Manvel has included near-term groundwater expansion in a recent ordinance related to infrastructure development.	N
Montgomery County MUDs 8 and 9 GRP Infrastructure	Groundwater wells and other;Indirect reuse	Montgomery County MUD 9; Montgomery County MUD 8	2,362	2,362	2,362	Coordination with project sponsor is ongoing.	TBD
NFBWA Member District Reuse Infrastructure	Other direct reuse	North Fort Bend Water Authority	3,816	3,816	3,816	Additional districts within NFBWA have implemented and/or increased reuse.	N
NHCRWA Member District Reuse Infrastructure	Other direct reuse	North Harris County Regional Water Authority	300	300	300	Additional districts within NHCRWA have implemented and/or increased reuse.	N
Pearland Reuse Infrastructure	Other direct reuse	Pearland	314	1,154	1,154	The City of Pearland has approved expansion of the Barry Rose Water Reclamation Facility.	N
Porter SUD GRP Infrastructure - Phase 1	Indirect reuse	Porter SUD	1,680	2,240	2,240	Coordination with project sponsor is ongoing.	TBD
Richmond Reuse Infrastructure	Other direct reuse	Richmond	458	458	458	Richmond has executed a reuse agreement with Fort Bend MUD 215 and awarded a contract for the expansion of the reclaimed water system at the Regional Wastewater Treatment Plant .	N
Surfside Beach Supply Infrastructure	Other surface water	Surfside Beach	323	323	323	Surfside beach has contracted with Freeport for the associated source water. Contracts have been awarded for construction and a loan has been secured from TWDB.	N
Westwood Shores Reuse Infrastructure	Other direct reuse	Westwood Shores MUD	150	150	150	Westwood Shores MUD has procured project funding support through the State Revolving Fund.	N
WUG Infrastructure Expansion - County-Other, Brazoria (SJ-B)	Groundwater wells and other;Other surface water	Municipal county-other (Brazoria)	331	4,600	4,269	Project represents expansions by multiple current and newly-created PWS in County-Other, and does not have a single sponsor entity. Due to the limited required infrastructure at the individual PWS scale and the presence urbanization of County-Other areas, project is feasible for relatively rapid implementation where applicable.	N
WUG Infrastructure Expansion - County-Other, Fort Bend (B)	Other surface water	Municipal county-other (Fort Bend)	675	3,675	2,589	Project represents expansions by multiple current and newly-created PWS in County-Other, and does not have a single sponsor entity. Due to the limited required infrastructure at the individual PWS scale and the presence urbanization of County-Other areas, project is feasible for relatively rapid implementation where applicable.	N
WUG Infrastructure Expansion - County-Other, Fort Bend (SJ)	Other surface water	Municipal county-other (Fort Bend)	675	3,675	2,589	Project represents expansions by multiple current and newly-created PWS in County-Other, and does not have a single sponsor entity. Due to the limited required infrastructure at the individual PWS scale and the presence urbanization of County-Other areas, project is feasible for relatively rapid implementation where applicable.	N

WMS Project	Related WMS Types	WMS Project Sponsor and/or select WUG Beneficiary List	2021 RWP Allocated Strategy Supply (ac-ft)			Assessment	WMS Project Identified as Infeasible? (Y/N)
			2,020	2,030	2,040		
WUG Infrastructure Expansion - County-Other, Galveston (SJ-B)	Other surface water	Municipal county-other (Galveston)	996	996	996	Project represents expansions by multiple current and newly-created PWS in County-Other, and does not have a single sponsor entity. Due to the limited required infrastructure at the individual PWS scale and the presence urbanization of County-Other areas, project is feasible for relatively rapid implementation where applicable.	N
WUG Infrastructure Expansion - County-Other, Harris County (SJB)	Other surface water	Municipal county-other (Harris)	831	3,047	5,677	Project represents expansions by multiple current and newly-created PWS in County-Other, and does not have a single sponsor entity. Due to the limited required infrastructure at the individual PWS scale and the presence urbanization of County-Other areas, project is feasible for relatively rapid implementation where applicable.	N
WUG Infrastructure Expansion - County-Other, Harris County (TSJ) - Phase 1	Other surface water	Municipal county-other (Harris)	831	3,047	5,677	Project represents expansions by multiple current and newly-created PWS in County-Other, and does not have a single sponsor entity. Due to the limited required infrastructure at the individual PWS scale and the presence urbanization of County-Other areas, project is feasible for relatively rapid implementation where applicable.	N
WUG Infrastructure Expansion - Fort Bend County MUD 49	Other surface water	Fort Bend County MUD 49	64	115	114	Coordination with project sponsor is ongoing.	TBD
WUG Infrastructure Expansion - Harris County MUD 122	Other surface water	Harris County MUD 122	7	29	51	Coordination with project sponsor is ongoing.	TBD
WUG Infrastructure Expansion - Manufacturing, Brazoria County (BC)	Other surface water	Manufacturing (Brazoria)	21,772	27,812	27,812	Project reflects recommendation for aggregate Manufacturing WUG. Measures would not be expected to be funded through water supplier programs or require board actions. Individual industrial entities could implement measures over a reasonably short timescale if desired. Documentation may be confidential.	N
WUG Infrastructure Expansion - Manufacturing, Fort Bend County (B)	Other surface water	Manufacturing (Fort Bend)	256	1,086	1,086	Project reflects recommendation for aggregate Manufacturing WUG. Measures would not be expected to be funded through water supplier programs or require board actions. Individual industrial entities could implement measures over a reasonably short timescale if desired. Documentation may be confidential.	N
WUG Infrastructure Expansion - Manufacturing, Fort Bend County (SJ)	Other surface water	Manufacturing (Fort Bend)	256	1,086	1,086	Project reflects recommendation for aggregate Manufacturing WUG. Measures would not be expected to be funded through water supplier programs or require board actions. Individual industrial entities could implement measures over a reasonably short timescale if desired. Documentation may be confidential.	N
WUG Infrastructure Expansion - Manufacturing, Galveston County	Other surface water	Manufacturing (Galveston)	20,061	20,088	20,114	Project reflects recommendation for aggregate Manufacturing WUG. Measures would not be expected to be funded through water supplier programs or require board actions. Individual industrial entities could implement measures over a reasonably short timescale if desired. Documentation may be confidential.	N
WUG Infrastructure Expansion - Manufacturing, Montgomery County	Other surface water	Manufacturing (Montgomery)	292	570	570	Project reflects recommendation for aggregate Manufacturing WUG. Measures would not be expected to be funded through water supplier programs or require board actions. Individual industrial entities could implement measures over a reasonably short timescale if desired. Documentation may be confidential.	N
WUG Infrastructure Expansion - Memorial Villages Water Authority - Phase 1	Other surface water	Memorial Villages Water Authority	2,069	2,388	2,758	Coordination with project sponsor is ongoing.	TBD
WUG Infrastructure Expansion - Mining, Galveston County (NT)	Other surface water	Mining (Galveston)	70	76	83	Project reflects recommendation for aggregate Mining WUG. Measures would not be expected to be funded through water supplier programs or require board actions. Individual industrial entities could implement measures over a reasonably short timescale if desired. Documentation may be confidential.	N
WUG Infrastructure Expansion - Mining, Galveston County (SJB)	Other surface water	Mining (Galveston)	273	292	322	Project reflects recommendation for aggregate Mining WUG. Measures would not be expected to be funded through water supplier programs or require board actions. Individual industrial entities could implement measures over a reasonably short timescale if desired. Documentation may be confidential.	N
WUG Infrastructure Expansion - Mining, Harris County (SJ)	Other surface water	Mining (Harris)	2,946	2,927	2,875	Project reflects recommendation for aggregate Mining WUG. Measures would not be expected to be funded through water supplier programs or require board actions. Individual industrial entities could implement measures over a reasonably short timescale if desired. Documentation may be confidential.	N
WUG Infrastructure Expansion - Mining, Harris County (SJB)	Other surface water	Mining (Harris)	2,946	2,927	2,875	Project reflects recommendation for aggregate Mining WUG. Measures would not be expected to be funded through water supplier programs or require board actions. Individual industrial entities could implement measures over a reasonably short timescale if desired. Documentation may be confidential.	N
WUG Infrastructure Expansion - Mining, Harris County (TSJ)	Other surface water	Mining (Harris)	2,946	2,927	2,875	Project reflects recommendation for aggregate Mining WUG. Measures would not be expected to be funded through water supplier programs or require board actions. Individual industrial entities could implement measures over a reasonably short timescale if desired. Documentation may be confidential.	N
WUG Infrastructure Expansion - Shenandoah	Other surface water	Shenandoah	112	463	597	Coordination with project sponsor is ongoing.	TBD
WUG Infrastructure Expansion - Steam-Electric Power, Chambers County (TSJ)	Other surface water	NRG; Steam-electric power (Chambers)	1,387	1,387	1,387	Coordination with project sponsor is ongoing.	TBD
WUG Infrastructure Expansion - Steam-Electric Power, Harris County (SJ)	Other surface water	Steam-electric power (Harris); NRG	3,581	3,581	3,581	Coordination with project sponsor is ongoing.	TBD
WUG Infrastructure Expansion - Steam-Electric Power, Harris County (SJB)	Other surface water	Steam-electric power (Harris); NRG	3,581	3,581	3,581	Coordination with project sponsor is ongoing.	TBD

WMS Project	Related WMS Types	WMS Project Sponsor and/or select WUG Beneficiary List	2021 RWP Allocated Strategy Supply (ac-ft)			Assessment	WMS Project Identified as Infeasible? (Y/N)
			2,020	2,030	2,040		
WUG Infrastructure Expansion - The Woodlands - Phase 1	Other surface water	The Woodlands	1,567	7,305	8,351	SJRA and The Woodlands are working on developing expanded infrastructure, with budgeted efforts including expanded storage tank capacity.	N
WUG Infrastructure Expansion - Trinity Bay Conservation District - Phase 1	Other surface water	Trinity Bay Conservation District	342	631	955	Coordination with project sponsor is ongoing.	TBD
WUG Infrastructure Expansion (Brackish Groundwater) - Dobbin-Plantersville WSC - Phase 1	Groundwater wells and other	Dobbin Plantersville WSC	258	432	683	Entity has developed additional groundwater capacity. Target formation is different than 2021 RWP assumption, but should be noted that the newer adjusted availability estimate is not capable of being reflected in 2021 RWP.	N
WUG Infrastructure Expansion (Groundwater) - County-Other, Montgomery (SJRA GRP Participants)	Conjunctive use	Municipal county-other (Montgomery)	4,416	16,548	14,151	SJRA GRP participants in County-Other have developed additional well infrastructure subsequent to the 2021 RWP.	N
WUG Infrastructure Expansion (Groundwater) - County-Other, Waller County (B) - Phase 1	Groundwater wells and other	Municipal county-other (Waller)	975	975	2,050	Project reflects groundwater expansion for non-WUG PWS and domestic use from small wells. TWDB well databases indicate additional groundwater wells have been drilled for domestic in Waller County subsequent to the 2021 RWP.	N
WUG Infrastructure Expansion (Groundwater) - County-Other, Waller County (SJ) - Phase 1	Groundwater wells and other	Municipal county-other (Waller)	525	525	1,050	Project reflects groundwater expansion for non-WUG PWS and domestic use from small wells. TWDB well databases indicate additional groundwater wells have been drilled for domestic in Waller County subsequent to the 2021 RWP.	N
WUG Infrastructure Expansion (Groundwater) - Irrigation, Liberty County (N)	Groundwater wells and other	Irrigation (Liberty)	3,925	3,925	3,925	TWDB well databases indicate additional groundwater wells have been drilled for agriculture in Liberty County subsequent to the 2021 RWP. Measures would not be expected to be funded through water supplier programs or require formal actions by boards, but would be implemented by individuals. Could implement measures over a reasonably short timescale if desired.	N
WUG Infrastructure Expansion (Groundwater) - Irrigation, Liberty County (SJ)	Groundwater wells and other	Irrigation (Liberty)	725	725	725	TWDB well databases indicate additional groundwater wells have been drilled for agriculture in Liberty County subsequent to the 2021 RWP. Measures would not be expected to be funded through water supplier programs or require formal actions by boards, but would be implemented by individuals. Could implement measures over a reasonably short timescale if desired.	N
WUG Infrastructure Expansion (Groundwater) - Livestock, Liberty County (N)	Groundwater wells and other	Livestock (Liberty)	100	100	100	TWDB well databases indicate additional groundwater wells have been drilled for agriculture in Liberty County subsequent to the 2021 RWP. Measures would not be expected to be funded through water supplier programs or require formal actions by boards, but would be implemented by individuals. Could implement measures over a reasonably short timescale if desired.	N
WUG Infrastructure Expansion (Groundwater) - Livestock, Liberty County (NT)	Groundwater wells and other	Livestock (Liberty)	100	100	100	TWDB well databases indicate additional groundwater wells have been drilled for agriculture in Liberty County subsequent to the 2021 RWP. Measures would not be expected to be funded through water supplier programs or require formal actions by boards, but would be implemented by individuals. Could implement measures over a reasonably short timescale if desired.	N
WUG Infrastructure Expansion (Groundwater) - Livestock, Liberty County (SJ)	Groundwater wells and other	Livestock (Liberty)	100	100	100	TWDB well databases indicate additional groundwater wells have been drilled for agriculture in Liberty County subsequent to the 2021 RWP. Measures would not be expected to be funded through water supplier programs or require formal actions by boards, but would be implemented by individuals. Could implement measures over a reasonably short timescale if desired.	N
WUG Infrastructure Expansion (Groundwater) - Livestock, Liberty County (T)	Groundwater wells and other	Livestock (Liberty)	325	325	325	TWDB well databases indicate additional groundwater wells have been drilled for agriculture in Liberty County subsequent to the 2021 RWP. Measures would not be expected to be funded through water supplier programs or require formal actions by boards, but would be implemented by individuals. Could implement measures over a reasonably short timescale if desired.	N
WUG Infrastructure Expansion (Groundwater) - Livestock, Liberty County (TSJ)	Groundwater wells and other	Livestock (Liberty)	100	100	100	TWDB well databases indicate additional groundwater wells have been drilled for agriculture in Liberty County subsequent to the 2021 RWP. Measures would not be expected to be funded through water supplier programs or require formal actions by boards, but would be implemented by individuals. Could implement measures over a reasonably short timescale if desired.	N
WUG Infrastructure Expansion (Groundwater) - Manufacturing, Chambers County (T)	Groundwater wells and other	Manufacturing (Chambers)	2,775	3,500	3,500	TWDB well databases indicate additional groundwater wells have been drilled for industrial use in Chambers County subsequent to the 2021 RWP.	N

Agenda Item 10

Discuss preliminary scope and budget for requesting Task 5 funds for the initiation of detailed investigation into potential water management strategies and consider making recommendations to the RHWPG.

REGION H
Water Planning Group

Agenda Item 10
Task 5 Funding


Development of WMS Planning Database


Update & Reallocation of Strategies


Comprehensive Cost Updates


Contractual Transfers


Municipal Conservation

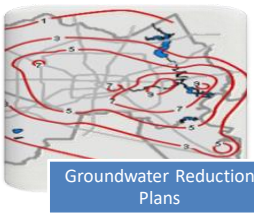

Irrigation Conservation

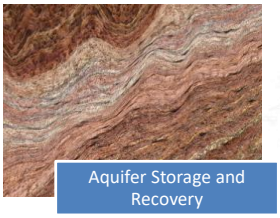

Industrial Conservation


Other Demand Management

Agenda Item 10
Task 5 Funding


Expanded Use of Groundwater


Groundwater Reduction Plans


Aquifer Storage and Recovery

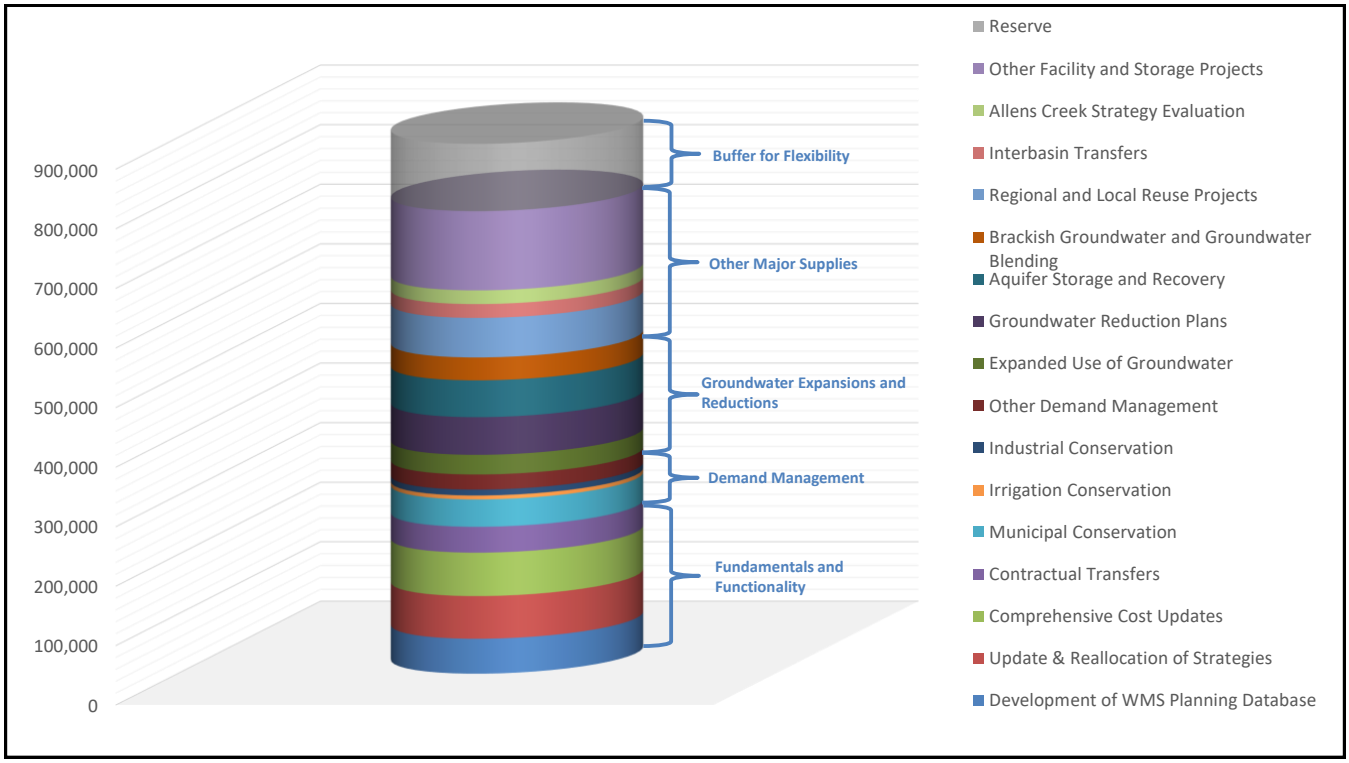

Brackish Groundwater and Groundwater Blending


Regional and Local Reuse Projects


Interbasin Transfers


Allens Creek Strategy Evaluation


Other Facility and Storage Projects



Agenda Item 10
Task 5 Funding

- Thoughts?
- Recommendations to RWPG?

Subtask Code	Subtask	Brief Scope Summary	Deliverable	Entities Potentially Served by WMS(s)	Addressing changed condition from previous cycle?	When was this WMS identified by RWPG as potentially feasible?	Was the WMS evaluated in any previous Regional Water Planning Cycles?	Is evaluation a limited update to previous technical evaluation
5B01.1	Development of WMS Planning Database	Prepare a planning tool for allocation of WMS volumes and costs to enhance project allocation. Coordinate with TWDB regarding structure and functionality of DB27 in order to mirror statewide process for project and WMS tracking.	Inputs to DB27 for all WMS and projects.	Multiple	No	N/A	N/A	N/A
5B02.1	Update & Reallocation of Strategies	Evaluate potential water management strategies based on technical evaluations and selection criteria matrix and develop documentation of selection process. Allocate selected WMS to WUGs with needs. Update RWP document and incorporate strategy allocations into DB27. Develop Chapter 5 document, incorporating modifications from public, RWPG, and agency comments.	Chapter 5 of the Regional Water Plan document and corresponding data submittal through the DB27 interface.	All with projected needs	Yes - based on updated needs assessment and recommended WMS	N/A	N/A	No
5B03.1	Comprehensive Cost Updates	Revisit cost updates for all projects and apply proper cost adjustments for inflation. Also investigate projects to identify opportunities to more thoroughly assign costs for under-documented project components in previous RWPs.	Updated technical memoranda for all projects not studied under specific, detailed analyses.	Any WUG or WWP with a WMS not studied in detail under separate funding	Yes- Updates for inflation and enhanced project definition	Yes, multiple WMS in previous RWPs	Yes - All planning cycles	Yes
5B04.1	Contractual Transfers	Examine WMS to identify which require contractual agreements and determine volumes associated with these agreements. Review will include both new supplies and recursive strategies such as transmission infrastructure WMS. Summarize recommended contractual relationships by entity and supply source.	Technical memorandum describing strategy and summarizing the contractual volumes and associated entities necessary to facilitate implementation of other WMS.	Any with WMS contingent on a contract	Yes - Potential for different contractual needs based on other WMS	Contractual transfer strategies recommended in 2001, 2006, 2011, 2016, and 2021 Regional Water Plans	Yes - 1st, 2nd, 3rd, 4th and 5th planning cycles	No
5B05.1	Municipal Conservation	Review WUG survey responses, water conservation plans, TWDB outdoor water use data, TWDB Water Loss Audit, and other available data to determine estimated achievable municipal conservation and water loss reduction levels based on WUG size or other key characteristics. Coordinate with municipal WUGs regarding conservation volumes and practices and incorporate any data received into strategy documentation and allocations.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Municipal WUGs	No	Was a recommended WMS in 2001, 2006, 2011, 2016, and 2021 Regional Water Plans	Yes - 1st, 2nd, 3rd, 4th and 5th planning cycles	No
5B05.2	Irrigation Conservation	Review technical documentation from the 2021 RWP and available crop acreage data and update calculations as appropriate to reflect changes in irrigation water demand projections. Update technical details, yields, costs, and other appropriate factors as applicable.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Irrigation WUGs	No	Was a recommended WMS in 2001, 2006, 2011, 2016, and 2021 Regional Water Plans	Yes - 1st, 2nd, 3rd, 4th and 5th planning cycles	Yes
5B05.3	Industrial Conservation	Review available literature and correspond with industrial water users regarding industrial water conservation practices within the region. Characterize volumes of potential conservation savings where entity-specific data is available. Update technical details, yields, costs, and other appropriate factors as applicable.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Manufacturing, Mining, and Steam Electric Power WUGs	Yes - substantial changes to industrial demand projections and evolution of industry and water use.	Was a recommended WMS in 2006, 2011, and 2016 Regional Water Plans	Yes - 2nd, 3rd, and 4th planning cycles	No
5B05.4	Other Demand Management	Review WUG survey responses, drought contingency plans, TWDB and TCEQ data, and other available data to determine estimated achievable savings from drought contingency measures or other demand management based on measure type, WUG size, or other key characteristics. Coordinate with WWPs and municipal WUGs regarding volumes and practices and incorporate any data received into strategy documentation.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Multiple potential WWPs and WUGs in Region H	No	Was a considered WMS in 2006, 2011, 2016, and 2021 Regional Water Plans	Yes - 2nd. 3rd, 4th, and 5th planning cycles	No
5B06.1	Expanded Use of Groundwater	Coordinate with the groundwater regulating agencies regarding the status and results of the ongoing groundwater availability rules. Identify WUGs or groups of WUGs currently utilizing groundwater sources. Compare against remaining volumes of modeled available groundwater after allocation of existing groundwater supplies. Allocate remaining modeled available groundwater to WUGs with needs within the limits of groundwater reduction plans and subsidence and conservation district rules. Update technical details, yields, costs, and other appropriate factors as applicable.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	WUGs in counties with projected needs and unallocated groundwater supplies	Yes - Updated availability estimates and groundwater rule making	Was a recommended WMS in 2006, 2011, 2016, and 2021 Regional Water Plans	Yes - 2nd. 3rd, 4th, and 5th planning cycles	No
5B06.2	Groundwater Reduction Plans	Coordinate with project sponsors regarding the status of their projects. Update technical details, yields, costs, and other appropriate factors as applicable.	Technical memoranda describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Multiple WUGs and WWPs in Fort Bend, Galveston, and Harris Counties	Yes - Partial implementation and updates to a number of GRPs	Multiple GRPs recommended in 2016 and 2021 Regional Water Plans	Yes - 4th and 5th planning cycles	No
5B06.3	Aquifer Storage and Recovery	Identify aquifers and locations with potential to receive and store treated source water and amount storable and retrievable. Identify required rates, other characteristics, impacts to subsidence and physical and technical limitations. Identify potential available production capacity and infrastructure for potential sponsors. Investigate source and recipient water quality and consider treatment needs and methods to avoid or manage comingling. Summarize project cost and legal and regulatory constraints. Coordinate as applicable with potential project sponsors and local regulating entities.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Multiple	No	Was a considered WMS in 2016 and 2021 Regional Water Plan.	Yes - 4th and 5th planning cycles	No
5B06.4	Brackish Groundwater and Groundwater Blending	Identify areas within Region H where water from two different aquifers could be blended to obtain a combined supply not requiring advanced treatment. Assess viable areas in the context of current regulatory structures to identify areas or entities that could benefit from blended groundwater sources. Coordinate with current users of brackish water regarding potential future expansions of brackish groundwater capacity. Update technical details, yields, costs, and other appropriate factors as applicable.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Multiple potential WWPs and WUGs in Region H in proximity to brackish groundwater	Yes - increased development of brackish groundwater supplies in the Region	Was a recommended WMS in 2016 and 2021 Regional Water Plans	Yes - 4th and 5th planning cycles	No

Subtask Code	Subtask	Brief Scope Summary	Deliverable	Entities Potentially Served by WMS(s)	Addressing changed condition from previous cycle?	When was this WMS identified by RWPG as potentially feasible?	Was the WMS evaluated in any previous Regional Water Planning Cycles?	Is evaluation a limited update to previous technical evaluation
5B07.1	Regional and Local Reuse Projects	Coordinate with strategy sponsors regarding the status of reuse projects. Update technical details, yields, costs, and other appropriate factors as applicable. Evaluate potential source availability with consideration for updated demand distribution, utility-based WUG boundaries, and existing and pending reuse authorizations. Strategies include potential WUG-level reuse projects for sponsors identified in the 2021 RWP, potential expansion of current reuse facilities, and wastewater reclamation for municipal irrigation.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Multiple potential WWPs and WUGs in Region H	Varies by project	Reuse considered or recommended in 2001, 2006, 2011, 2016, and 2021 Regional Water Plans	Yes - 1st, 2nd, 3rd, 4th and 5th planning cycles	No
5B08.1	Interbasin Transfers	Examine available literature regarding potential inter-basin transfers to supply users in Region H, including strategies considered or recommended in prior RWPs. Coordinate with sponsors regarding the status of projects and sponsor analyses, including expected changes to project capacity, implementation timeline, and costs. Where applicable, refine RWP-level estimates of infrastructure components and potential transfer routing. Update technical details, yields, costs, and other appropriate factors as applicable.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Multiple potential WWPs and WUGs in Region H	Yes - Changes in supply reservations among basins	Considered or recommended WMS in 2001, 2006, 2011, 2016, and 2021 Regional Water Plans	Yes - 1st, 2nd, 3rd, 4th and 5th planning cycles	Yes
5B08.2	Allens Creek Strategy Evaluation	Coordinate with sponsor regarding the status of project development and identify any expected changes to project capacity, implementation timeline, and costs. Update technical details, yields, costs, and other appropriate factors as applicable.	Technical memorandum describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Brazos River Authority and customer WWPs/WUGs	Yes - Project actively moving forward	Was a recommended WMS in 2001, 2006, 2011, 2016, and 2021 Regional Water Plans	Yes - 1st, 2nd, 3rd, 4th and 5th planning cycles	No
5B08.3	Other Facility and Storage Projects	Coordinate with identified or potential sponsors regarding the status of projects. Update technical details, yields, costs, and other appropriate factors as applicable. Strategies include seawater desalination, new and expanded treatment facilities, transmission, and storage projects.	Technical memoranda describing strategy and summarizing as applicable supply sources and quantities, sponsors and users, facility locations, implementation schedule, cost, issues and considerations regarding implementation, and relevant references.	Multiple	Varies by project	Various infrastructure and storage concepts in prior Regional Water Plans	Yes - 2nd, 3rd, 4th, and 5th planning cycles	Yes

Agenda Item 11

Discuss additional potential water management strategy focus areas for the 2026 RWP.

REGION H
Water Planning Group

Agenda Item 11
Other Focus Areas

- Other items that may evolve?
- Possible recommendations for agencies, legislation, or funding?
- Looking beyond this cycle?