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## **CHAPTER 7.0 :LONG TERM PROTECTION OF THE STATE'S WATER RESOURCES, AGRICULTURAL RESOURCES, AND NATURAL RESOURCES**

### ***7.1 Long-term Protection of the State's Water Resources***

The population of the region is expected to increase by over 300 percent over the next 50 years. In order to meet the associated DMI water demands, the Rio Grande Regional Water Planning Group has identified three goals aimed at curbing DMI water use through conservation and diversification: (1) optimize the supply of water available from the Rio Grande, (2) reduce projected DMI water demands through expanded water conservation programs, and (3) diversify water supply sources for DMI use through appropriate development of alternate water supply sources (i.e., reuse of reclaimed water, groundwater, desalination, etc.).

Chapter 2 of this report contains projected demands data provided by TWDB. Chapter 3 of this report gives an in-depth analysis of current and future water supplies for each WUG.

Past regional water planning studies included estimated water savings due to water conservation in the overall demand figure for each Water User Group (WUG). In this round of regional planning, the TWDB has determined that "reductions due to the installation of water-efficient plumbing fixtures in new construction, as well as from the replacement of older fixtures, will be included in the Regional Water Plans based on data provided by the TWDB." These measures are treated as a requirement for each municipal WUG thereby reducing per-capita water demand throughout the extent of the planning study. In addition, the Regional Planning Group recognizes the effect of additional conservation measures on the water supply in the region. For this reason, Advanced Water Conservation was recognized as a Water Management Strategy. This strategy consists of public information, school education, and residential clothes washer conversion. Any additional conservation measures will be treated as Advanced Water Conservation. Water conserved actually decreases overall demand resulting in less potential supply needed to meet that demand. This strategy is explained in more detail in Chapter 4.

Optimizing the supply of water available from the Rio Grande is another important aspect of protecting the State's water resources since the river is the main source for both DMI use and irrigation use. As populations grow, irrigable land is lost and the associated irrigation water demand is also reduced. Logically, large portion of the region's future DMI water supply will come from the Rio Grande. Municipalities can acquire Rio Grande water rights through

purchase, urbanization, and contract. Chapter 2 explains projected reductions in irrigation demand. By 2060, irrigations demands are expected to decrease by 227,898 acre-feet. Since irrigation water rights can be converted to DMI use on a two-to-one basis, an additional CMI Rio Grande water supply of 113,949 acre-feet is possible. However, not all of this water is feasible for conversion to DMI use. A portion should be retained to reduce existing irrigation deficits.

Diversifying water supply sources for DMI use will also aid in protecting the State's water resources. Water management strategies such as brackish and seawater desalination, potable and non-potable reuse, and groundwater development will reduce the impact on existing water sources for DMI use, especially the Rio Grande.

## **7.2 Long-term Protection of the State's Agricultural Resources**

Over the next 20 years, an irrigation water supply deficit of over 410,000 acre-feet is projected. Considering the effects of urbanization on irrigable land, this deficit may decline slightly, to 210,000 acre-feet by 2060. (This information can be seen in the Irrigation Water User Group supply/deficit tables in the appendix.) In Chapter 4, the Rio Grande RWPG recommends two Water Management Strategies (WMSs)—on-farm conservation and conveyance system improvements—to reduce this impact. On-farm improvements include field-level water measurement, installation of poly or gated pipe, and improved water management practices. Conveyance system improvements include installation of no-leak gates, water measurement, canal linings, and conversion of canals to pipelines. Potential water savings associated with on-farm improvements is 274,000 acre-feet, while conveyance system improvements could yield savings of 243,000 acre-feet<sup>1</sup>. In the long run, total water savings associated with both strategies would allow irrigators to offset water supply deficits. However, the implementation timeframe will not offer immediate relief.

Another factor in maintaining and supplementing irrigation water supplies is Mexico's compliance with the 1944 treaty with the U.S. Even though Mexico is in the midst of repaying its water debt, there is little assurance future compliance should the region be gripped by another severe drought. Due to Mexico's breach of its treaty obligations from 1992 to 2002, Texas A&M studies have shown that the Lower Rio Grande Valley lost nearly \$1 billion in decreased economic activity and 30,000 jobs as a direct result of that shortfall.<sup>2</sup>

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<sup>1</sup> Fipps, Guy. "Potential Water Savings in Irrigated Agriculture for the Rio Grande Planning Region (Region M)." May 6, 2005.

<sup>2</sup> Press Release. Marzulla & Marzulla: Attorneys at Law. "Texas Water Rights Holders Still Seeking \$500 Million in Compensation for Economic Injuries Caused by Mexico". March 14, 2005.

### **7.3 Long-term Protection of the State's Natural Resources**

Environmental flow needs are in the forefront of all issues dealing with long-term protection of the Texas' natural resources. As water is diverted from the Rio Grande, river flows also drop. With the potential for increasing reliance on the Rio Grande, the issue of maintaining and/or increasing environmental flows should be a concern now and in coming years.

One possibility for maintaining and increasing environmental flows is the purchase or donation of Rio Grande water rights for environmental usage into the Texas Water Trust. These water rights could be managed to produce sufficient flows throughout the region. However, this option may not be viable because of the current water rights purchase and transfer structure.

Even though environmental flows on the Rio Grande were previously discussed, flows in the Arroyo Colorado and other regional estuaries are equally as important.

Given the WUG format currently being implemented by the TWDB, no option exists to formally allocate projected water supplies for environmental use. Alternatively, environmental flows in the Rio Grande could be included as a separate WUG in the next round of regional planning to ensure minimums would be met in a manner consistent with all other WUGs.

International cooperation (i.e., Mexico's) is critically needed to maintain flow levels. The United States Fish and Wildlife Service is currently in talks with Mexico regarding the introduction of fish to the Rio Grande. Even though this is the case, if the United States were to implement an environmental flow program without Mexico's participation, the desired effect would be significantly reduced.

Another of the region's critical environmental issues is the growth of Salt Cedar and other invasive plants such as Water Hyacinth and Hydrilla, among others. Salt Cedar has begun to make its way through the region. Water Hyacinth and Hydrilla are already well established. Unfortunately, eradication methods are both costly and physically strenuous. The natural rise and fall of water elevation in rivers and streams somewhat curtails these plants by drowning out new seedlings. However, in areas of minimal water flow, a perfect scenario exists for invasive plant growth.

### **7.4 Supplemental Evaluation of Potential Long-Term Changes in Freshwater Inflows to the Lower Laguna Madre Estuary**

The National Wildlife Federation (NWF) has approached the Lower Rio Grande Planning Group with a proposal to supplement the assessment of potential cumulative effects of regional water plan implementation on the Lower Laguna Madre Estuary. This would be accomplished by calculating changes in freshwater inflow expected to the Lower Laguna Madre Estuary with the Region M Plan in place, comparing these inflows to two baselines, and providing two ecologically-based assessments. The baselines for comparison include freshwater inflows under “Natural” and “Present” conditions. The two ecologically-based assessments rely, in part, upon the freshwater inflow recommendations of the Texas Parks and Wildlife Department and the TWDB and focus upon spring/early summer freshwater inflow pulses and drought periods during the months of March through October as used in a recent NWF publication.

As indicated in Attachment 7-2, there is no significant impact to the freshwater inflows into the Laguna Madre as a result of this region’s Water Management Strategies. Even with an increase in wastewater reuse, this is offset with an increase in population and subsequent wastewater flows.

*Region M Regional Water Plan*

ATTACHMENT 7-1

**Region M Regional Water Plan**

**CHECKLIST FOR COMPARISON OF THE REGIONAL WATER PLAN TO APPLICABLE WATER PLANNING REGULATIONS**

The purpose of this attachment is to help determine how the Regional Water Plan is consistent with long-term protection of the water, agricultural, and natural resources of the State of Texas. Accordingly, the following checklist includes a regulatory citation (Column 1) for all subsections and paragraphs contained in the applicable portions of water planning regulations:

- 31 TAC Chapter 358.3
- 31 TAC Chapter 357.5
- 31 TAC Chapter 357.7
- 31 TAC Chapter 357.8
- 31 TAC Chapter 357.9

<b>CHECKLIST FOR REVIEW OF 2006 IPPS</b>		
<b>Rule</b>	<b>Description (See Rule or Contract for Complete Description)</b>	<b>Chap.</b>
Chapter 357	<b>REGIONAL WATER PLANNING GUIDELINES</b>	
§357.5	<b>Guidelines for Development of Regional Water Plans</b>	Exhibit B
§357.5(d)(1)&(2)	Use state population and water demand projections that have been adopted by the TWDB board	Chapter 2 Sections 2.2 & 2.3
§357.5(e)(1)	Adjusted WMSs for appropriate environmental water needs	Chapter 4 Chapter 5 Chapter 7
§357.5(e)(2)	Provided WMSs to be used during a drought of record	Chapter 4 Chapter 6
§357.5(e)(3)	Protected water rights, water contracts and option agreements. May consider amendments of water rights, contracts etc.	Chapter 4 Chapter 7
§357.5(e)(4)	Specific recommendations of WMSs were based on analysis and comparison of all potentially feasible WMSs	Chapter 4 Sections 4.3, 4.5, & 4.7
§357.5(e)(4)	Prior to identifying potentially feasible WMSs, RWPG documented its process for identifying potentially feasible WMSs	Chapters 4,10 Sections 4.0 & 4.1
§357.5(e)(5)	Incorporated water conservation and drought contingency planning	Chapters 4,6 Sections 4.4 & 4.5.4
§357.5(e)(6)	Conducted planning to achieve efficient use of existing water supplies	Chapter 4 Chapter 6

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§357.5(e)(6)	Explored opportunities and benefits of regional water supply facilities or providing regional management of regional facilities	Chapter 4
§357.5(e)(6)	Coordinated actions of local and regional water resource management agencies	Chapter 1 Chapter 4 Chapter 10
§357.5(e)(6)	Provided substantial involvement by the public in the decision-making process and provide full dissemination of planning results	Chapter 10
§357.5(e)(7)(A)	Specific factors were considered to initiate a drought response for each water supply source designated in §357.7(a)(3)	Chapter 6
§357.5(e)(7)(B)	Actions to be taken as part of the drought response	Chapter 6 Attachments
§357.5(e)(8)	Effect of the regional water plan on navigation	Chapter 7
§357.5(f)	Prepared the regional water plan to be consistent with all laws applicable to water use in the RWPA	Chapter 4 Chapter 7
§357.5(h)	For special water resources, protected water rights, water supply contracts, etc. for demands outside the RWPA	Chapter 4
§357.5(h)	For special water resources, provided holders of interests in water rights, water supply contracts, etc. notice of and an opportunity to comment on the scope of work and proposed water plan.	Chapter 10
§357.5(i)	Consider emergency transfers of surface water to meet non-municipal use pursuant to TWC §11.139	Chapter 4 Chapter 7
§357.5(k)(1)	Consider existing plans and information, including the following:	
§357.5(k)(1)(A)	Water conservation plans	Chapter 6 Attachments
§357.5(k)(1)(B)	Drought contingency plans	Chapter 6 Attachments
§357.5(k)(1)(C)	Information from water loss audits - N/A until 2011 Regional Water Plans	
§357.5(k)(1)(D)	Certified groundwater conservation district management plans	Chapter 3 Chapter 4
§357.5(k)(1)(E)	Publicly available plans of major agricultural, municipal, manufacturing and commercial water users	Chapter 3 Chapter 4
§357.5(k)(1)(F)	Water management plans	Chapter 3 Chapter 4
§357.5(k)(1)(G)	Water availability requirements promulgated by a county commissioners court pursuant to TWC §35.019	Chapter 3 Chapter 4
§357.5(k)(1)(H)	Any other information available from existing local or regional water planning studies	Chapter 3 Chapter 4

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§357.5(k)(2)	Considered existing programs and goals, including the following:	
§357.5(k)(2)(A)	The state Clean Rivers Program	Chapter 3 Chapter 5
§357.5(k)(2)(B)	The federal Clean Water Act	Chapter 3 Chapter 5
§357.5(k)(2)(C)	Other planning goals, including but not limited to regionalization of water and wastewater services, where appropriate	Chapter 4 Chapter 5
§357.5(l)	Considered environmental water needs including instream flows and bay and estuary inflows	Chapter 3 Chapter 4 Chapter 7
§357.7	<b>Regional Water Plan Development</b>	
§357.7(a)(1)	Prepared description of regional water planning area, including:	Chapter 1
§357.7(a)(1)(A)	Wholesale water providers	Chapter 1
§357.7(a)(1)(B)	Current water use (for identified water use categories)	Chapter 1
§357.7(a)(1)(C)	Identified water quality problems	Chapter 1
§357.7(a)(1)(D)	Sources of groundwater and surface water including springs important for water supply or natural resource protection	Chapter 1
§357.7(a)(1)(E)	Major demand centers	Chapter 1
§357.7(a)(1)(F)	Agricultural and natural resources	Chapter 1
§357.7(a)(1)(G)	Social and economic aspects: current population and economic activities (primary and ones depend. on natural water resources)	Chapter 1
§357.7(a)(1)(H)	Assessed current preparations for drought	Chapter 1
§357.7(a)(1)(I)	Summarized existing regional water plans	Chapter 1
§357.7(a)(1)(J)	Summarized recommendations in state water plan	Chapter 1
§357.7(a)(1)(K)	Summarized of local water plans	Chapter 1
§357.7(a)(1)(L)	Any threats to agricultural and natural resources due to water quantity or water quality problems related to water supply	Chapter 1
§357.7(a)(2)	Presented current and projected population and water demands for the following:	Chapter 2
§357.7(a)(2)(A)(i)	Cities with populations greater than 500 people	Chapter 2
§357.7(a)(2)(A)(ii)	Retail public utilities for counties with less than five retail public utilities	Chapter 2
§357.7(a)(2)(A)(iii)	Individual retail public utilities or collective data for such utilities that form a logical reporting unit for counties with five or more	Chapter 2
§357.7(a)(2)(A)(iv)	Categories of water use for each county or portion of county in RWPA and by river basin if county is in more than one basin	Chapter 2

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§357.7(a)(2)(B)	Categories of water use for WWP's considering counties and river basins. Include WWP's contractual obligations and demands.	Chapter 2
§357.7(a)(2)(C)	How water-saving plumbing fixtures (per Chapter 372 of Health and Safety Code) impact projected municipal water use	Chapter 2
§357.7(a)(3)	Evaluated water supplies legally and physically available during drought of record using TWDB approved methods	Chapter 3
§357.7(a)(3)(A)(i)	Cities with populations greater than 500 people	Chapter 3
§357.7(a)(3)(A)(ii)	Retail public utilities for counties with less than five retail public utilities	Chapter 3
§357.7(a)(3)(A)(iii)	Individual retail public utilities or collective data for such utilities that form a logical reporting unit for counties with five or more	Chapter 3
§357.7(a)(3)(A)(iv)	Categories of water use for each county or portion of county in RWPA and by river basin if county is in more than one basin	Chapter 3
§357.7(a)(3)(B)	Categories of water use for WWP's considering counties and river basins	Chapter 3
§357.7(a)(4)	Analyzed water supplies and demands	Chapter 3
§357.7(a)(4)(A)	Compared water demands developed in §357.7(a)(2) with current supplies developed in §357.7(a)(3) to determine surpluses and needs.	Chapter 3
§357.7(a)(4)(A)(i)	Cities with populations greater than 500 people	Chapter 4
§357.7(a)(4)(A)(ii)	Retail public utilities for counties with less than five retail public utilities	Chapter 4
§357.7(a)(4)(A)(iii)	Individual retail public utilities or collective data for such utilities that form a logical reporting unit for counties with five or more	Chapter 4
§357.7(a)(4)(A)(iv)	Categories of water use for each county or portion of county in RWPA and by river basin if county is in more than one basin	Chapter 4
§357.7(a)(4)(A)	Evaluated social and economic impact of not meeting needs and report by RWPA and river basin.	Chapter 5
§357.7(a)(4)(B)	Categories of water use for WWP's considering counties and river basins	Chapter 4
§357.7(a)(5)	Developed Water Management Strategies	
§357.7(a)(5)(A)(i)	Cities with populations greater than 500 people	Chapter 4
§357.7(a)(5)(A)(ii)	Retail public utilities for counties with less than five retail public utilities	Chapter 4

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§357.7(a)(5)(A)(iii)	Individual retail public utilities or collective data for such utilities that form a logical reporting unit for counties with five or more	Chapter 4
§357.7(a)(5)(A)(iv)	Categories of water use for each county or portion of county in RWPA and by river basin if county is in more than one basin	Chapter 4
§357.7(a)(5)(B)	Categories of water use for WWPs considering counties and river basins	Chapter 4
§357.7(a)(5)(C)	Water Management Strategies not selected for WUGs or WWPs with need	Chapter 4
§357.7(a)(5)(C)(i)	Evaluation of WMSs must be shown and reasons given why no WMSs are feasible	Chapter 4
§357.7(a)(5)(C)(ii)	If political subdivision does not participate in planning process, has RWPG adopted equitable and reasonable terms of participation?	Chapter 4
§357.7(a)(6)	Presented data in additional reporting units, such as splitting a county into two, if desired by the RWPG	Chapter 4
§357.7(a)(7)	Evaluated all Water Management Strategies the RWPG determines to be potentially feasible:	Chapter 4
§357.7(a)(7)(A)	RWPG considered water conservation practices for each need identified in §357.7(a)(4)	Chapter 4
§357.7(a)(7)(A)(i)	Water conservation practices must be included for each WUG to which TWC §11.1271 applies in a manner consistent with §11.1271	Chapter 4
§357.7(a)(7)(A)(ii)	The RWPG shall adopt water conservation practices that exceed §11.1271 for affected WUGs or document the reason	Chapter 4
§357.7(a)(7)(A)(iii)	The highest practicable level of water conservation and efficiency achievable for interbasin transfers to which TWC §11.085(l) applies	Chapter 4
§357.7(a)(7)(A)(iv)	Considered strategies in response to an issues identified through water loss audits	Not available for 2006 RWP
§357.7(a)(7)(B)	RWPG considered drought management measures for each need identified in §357.7(a)(4)	Chapter 4
§357.7(a)(7)(B)	Drought management measures must be included for each WUG to which TWC §11.1272 applies in a manner consistent with §11.1272	Chapter 4
§357.7(a)(7)(B)	The RWPG shall adopt drought management measures that exceed §11.1272 for affected WUGs or document the reason	Chapter 4
§357.7(a)(7)(C)	Reuse of wastewater	Chapter 4
§357.7(a)(7)(D)	Expanded use of existing supplies: systems optimization, conjunctive use, reallocation of reservoir storages, voluntary redistribution, etc.	Chapter 4

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§357.7(a)(7)(E)	New supply development: construction and improvement of surface water and groundwater resources, brush control, etc.	Chapter 4
§357.7(a)(7)(F)	Interbasin transfers	Chapter 4
§357.7(a)(7)(G)	Other measures	Chapter 4
§357.7(a)(8)	Evaluated all Water Management Strategies the RWPG determines to be potentially feasible	
§357.7(a)(8)(A)(i)	Quantitative reporting of quantity, reliability, and cost of water delivered and treated for end user's requirements	Chapter 4
§357.7(a)(8)(A)(ii)	Quantitative reporting of environmental factors including effects on environmental water needs, wildlife habitat, etc.	Chapter 4
§357.7(a)(8)(A)(iii)	Quantitative reporting of impacts on agricultural resources	Chapter 4
§357.7(a)(8)(B)	Impacts on other water resources of the state including other WMSs and groundwater surface water relationships	Chapter 4
§357.7(a)(8)(C)	Discussed how threats to agricultural and natural resources identified in §357.7(a)(1)(L) will be addressed or affected	Chapter 4
§357.7(a)(8)(D)	Other factors deemed relevant by the RWPG including recreational impacts	Chapter 4
§357.7(a)(8)(E)	Equitable comparison and consistent application of all WMSs the RWPGs determine to be potentially feasible for each need	Chapter 4
§357.7(a)(8)(F)	Consideration of the provisions in TWC §11.085(k)(1) for interbasin transfers of surface water, including summing needs	Chapter 4
§357.7(a)(8)(G)	Third party impacts from voluntary redistributions of water and moving water from rural and agricultural areas	Chapter 4
§357.7(a)(8)(H)	Consideration of water pipelines and other facilities that can be used for water conveyance as described in §357.7(a)(1)(M)	Chapter 4
§357.7(a)(9)	WMSs described in sufficient detail to allow state agencies to make financial or regulatory decisions to determine consistency	Chapter 4
§357.7(a)(10)	Regulatory, admin., or legislative recommendations that RWPG believes are needed and desirable to meet purpose of SB 1	Chapter 8
§357.7(a)(11)	Chapter consolidating the water conservation and drought management recommendations of the RWP	Chapter 6

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§357.7(a)(12)	Described the major impacts of WMSs on key parameters of water quality important to the use of the water resource	Chapter 5
§357.7(a)(13)	Chapter describing how the Plan is consistent with long-term protection of water, agricultural, and natural resources	Chapter 7
§357.7(a)(14)	Chapter describing the financing needed to implement the WMSs. How local governments and others will pay for WMSs.	Chapter 9
§357.7(c)	Regional water plan includes a model water conservation plan pursuant to TWC §11.1271	Chapter 6
§357.7(d)	Regional water plan includes a drought contingency plan pursuant to TWC §11.1272	Chapter 6
§357.8	<b>Ecologically Unique River and Stream Segments</b>	
§357.8(a)	Recommendation package containing physical description and site characterization submitted to and evaluated by TPWD	Chapter 8
§357.8(c)	Impact of RWP on unique river and stream segments, comparing current conditions and conditions with WMSs	Chapter 8
§357.9	<b>Unique Sites for Reservoir Construction</b>	
§357.9	Description of the sites, reasons for the unique designation, and expected beneficiaries of water supply to be developed	Chapter 8
§357.10	<b>Format of Information to be Presented in RWPs</b>	
§357.10(a)(1)	Technical report and data prepared pursuant to rules and Exhibit B	Appendix
§357.10(a)(2)	Executive summary that documents the key RWP findings and recommendations	Attached to Report
§357.10(a)(3)	Summaries of comments from TWDB, any federal or state agency, and the public with RWPG response	Chapter 10
§357.10(b)	Transfer copies of all data and reports to TWDB	RWP
§357.10(b)	To extent possible data shall be in digital format per Exhibit B	RWP
§357.10(b)	One copy of all reports shall be in digital format per Exhibit B	RWP
§357.11	<b>Adoption of RWPs by RWPGs</b>	
§357.11(a)	IPP submitted in electronic and paper format as specified in Exhibit B	RWP
§357.11(a)	RWPG certification that IPP is complete and adopted by the RWPG	RWP
§357.12	<b>Notice and Public Participation</b>	
§357.12(a)(1)	Public meeting prior to preparation of the RWP	Chapter 10
§357.12(a)(2)	Opportunities for public input during preparation of	Chapter 10

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	RWP	
§357.12(a)(3)	Public hearing following adoption of initially prepared RWP	Chapter 10
§357.12(a)(5)	Notice published in newspaper of general circulation before 30th. day preceding date of public hearing and mailed to the following:	Chapter 10
§357.12(a)(5)(A)	Mayors of municipalities with population of 1000 or more	Chapter 10
§357.12(a)(5)(B)	County judges of counties located in whole or part of RWPA	Chapter 10
§357.12(a)(5)(D)	Retail public utilities that serve any part of RWPA or receives water from RWPA	Chapter 10
§357.12(a)(5)(E)	Holders of water rights for surface water diverted from RWPA	Chapter 10
§357.12(a)(6)	Notices shall include the following:	Chapter 10
§357.12(a)(6)(A)	Date, time and location of the public hearing	Chapter 10 Section 10.1
§357.12(a)(6)(B)	Summary of the proposed action to be taken	Chapter 10 Section 10.1
§357.12(a)(6)(C)	Name, telephone number, and address of the person for questions and requests for additional information	Chapter 10 Section 10.1
§357.12(a)(6)(D)	That RWPG will accept written and oral comments at hearing	Chapter 10 Section 10.1
§357.12(a)(6)(D)	How public may submit written comments separate from hearing	Chapter 10 Section 10.1
§357.12(a)(6)(D)	Deadline for submitting written comments not earlier than 30 days after the hearing	Chapter 10 Section 10.1
§357.12(b)	Copies of RWP available for public inspection at least one month before hearing at the following locations:	Chapter 10 Section 10.1
§357.12(b)	At least one public library in each county	Chapter 10 Section 10.1
§357.12(b)	Either the county courthouse's law library, county clerk's office, or some other accessible place within the county courthouse	Chapter 10 Section 10.1
§357.12(b)	Notice shall include locations of copies of RWP	Chapter 10 Section 10.1
§357.14	<b>Approval of RWP by the Board</b>	
§357.14(2)(B)	RWP must include water conservation and drought management practices that incorporate §357.7(7)(a)(A), a(B), (c), and (d)	Chapter 4 Section 4.5.4 Chapter 6
§357.14(2)(C)	Consistent with long-term protection of water, agricultural, and natural resources	Chapter 5 Chapter 7
§357.14(3)	No interregional conflict exists	Chapter 3 Chapter 4

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Chapter 358	<b>STATE WATER PLAN DEVELOPMENT</b>	
§358.3	<b>Guidelines</b>	
§358.3(b)	Development of the state and regional water plans shall be guided by the following principles:	
§358.3(b)(1)	Identified policies and actions to meet water needs and to respond to drought conditions to assure sufficient water supply for Texas	Chapter 4 Chapter 7
§358.3(b)(2)	Decision-making open to and accountable to the public; based on accurate, objective and reliable information	Chapter 4 Chapter 10
§358.3(b)(3)	Considered effects of policies or WMS on public interest, water supply, and those entities that provide water supply	Chapter 4 Chapter 5 Chapter 7
§358.3(b)(4)	Considered all WMS the board considers potentially feasible that are cost effective and which are consistent with long-term protection of water, agricultural, and natural resources	Chapter 4 Chapter 7
§358.3(b)(5)	Opportunities that encourage and result in voluntary transfers of water, including regional water banks, sales, leases etc.	Chapter 4
§358.3(b)(6)	Balance of economic, social, aesthetic, and ecological viability	Chapter 4
§358.3(b)(8)	Orderly development, management, and conservation of water resources	Chapter 4 Chapter 7
§358.3(b)(9)	Principles that all surface water is held by the state, use is via rights administered by the TCEQ, and prior appropriation applies	Chapter 3 Chapter 4
§358.3(b)(10)	Protection of existing water rights, water contracts, and option agreements	Chapter 3 Chapter 4
§358.3(b)(11)	Principal that use of groundwater is governed by the right of capture, unless under a local groundwater management district	Chapter 3
§358.3(b)(12)	Considered recommendations of river and stream segments of unique ecological value	Chapter 8
§358.3(b)(13)	Considered recommendation of sites of unique value for the construction of reservoirs	Chapter 8
§358.3(b)(14)	Coordinate water planning and management activities of local, regional, state and federal agencies	Chapter 4
§358.3(b)(15)	Designated water quality and related water uses shown in the state water quality plan should be improved or maintained	Chapter 5

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§358.3(b)(16)	Coordination of water planning/management activities of RWPGs to identify common needs, issues, and/or problems and working together to resolve conflicts equitably and fairly	Chapter 3 Chapter 4
§358.3(b)(17)	Describe WMSs in sufficient detail for state agencies to make financial/regulatory decisions that are consistent with the RWP	Covered by §357.7(a)(9)
§358.3(b)(18)	Evaluated alternative WMS using environmental criteria	Chapter 4
§358.3(b)(19)	Considered environmental water needs including instream flows and bay and estuary inflows	Chapter 7
§358.3(b)(20)	Planning consistent with all laws applicable to water use	Chapter 3 Chapter 4
§358.3(b)(21)	Inclusion of ongoing water development projects for which TCEQ has issued a permit	Chapter 3 Chapter 4
Exhibit B	<b>GUIDELINES FOR REGIONAL WATER PLAN DEVELOPMENT</b>	
PART 1	<b>Regional Water Plan Tasks and Requirements for Deliverables</b>	
1.2	Requirements for Deliverables	
1.2.1	Introduction	
1.2.1	All computer files and formats 100 percent compatible with PC-type computers.	RWP
1.2.1	Copies of electronic files (disc or CD) and electronic file lists and file description print outs (including metadata files).	RWP
1.2.1	Formats of all computer files shall be compatible with the widely distributed versions of the following programs:	RWP
1.2.1	Word processor files - Microsoft Word (MS Office 97 or newer)	RWP
1.2.1	GIS coverages - Arc/Info (7.21 or newer)	RWP
1.2.1	GIS shape files – Arc View (3.1 or newer)	RWP
1.2.1	Database files - Microsoft Access (MS Office 97 or newer)	RWP
1.2.1	Internet browsers – Internet Explorer (5.5 or newer) or Netscape (6 or newer)	RWP
1.2.1	Spreadsheets Files - Microsoft Excel (MS Office 97 or newer)	RWP
1.2.1	Graphs, bar-charts, pie-charts - Microsoft Excel (MS Office 97 or newer)	RWP
1.2.1	Drawings and graphs shall be provided in an Encapsulated PostScript format with tiff preview using Pantone process colors	RWP

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1.2.2	Data Units	
1.2.2	The following units shall be used, although equivalents in other units may be shown simultaneously:	
1.2.2	Land area - square miles (mi <sup>2</sup> )	RWP
1.2.2	Water area - acres (ac)	RWP
1.2.2	Water volume - acre-feet (ac-ft)	RWP
1.2.2	Demand and supply rates - acre-feet per year (ac-ft/yr)	RWP
1.2.2	Treatment plant capacities - million gallons per day (mgd)	RWP
1.2.2	Water use per capita - gallons per capita per day (gpcd)	RWP
1.2.2	Stream flows and reservoir releases - cubic feet per second (cfs)	RWP
1.2.2	Pumping rates - gallons per minute (gpm) or million gallons per day (mgd)	RWP
1.2.2	Cost – 2002 US Dollars (Engineering News Record (ENR) Construction Cost Index)	Chapter 4
1.2.3	Maps	
1.2.3	Minimum requirements of the maps are:	
1.2.3	Figures should be designed so that a black and white photocopy of the original is readable	RWP
1.2.3	Maps shall include title, border, and a title box that includes the Planning Group letter name, map name and number, and date prepared	RWP
1.2.3	For maps drawn to scale, the scale shall be clearly shown and clearly labeled including a scale bar.	RWP
1.2.3	Reference source of both the base map and any substantial additions to the base map.	RWP
1.2.3	Where possible, all maps shall be developed from source maps available from TWDB	RWP
1.2.5	Data Time Frame and Time Steps:	
1.2.5	Time periods and increments shall be 2000 (current year) and 2010, 2020, 2030, 2040, 2050, and 2060 for planning	RWP
1.2.7	Initially Prepared and Adopted Regional Water Plans	
1.2.7	The RWP will consist of the following:	
1.2.7	Executive summary of 30 pages or less	ES
1.2.7	Ten chapters:	
1.2.7	Planning area description	Chapter 1
1.2.7	Population and water demand projections	Chapter 2
1.2.7	Water supply analysis	Chapter 3
1.2.7	Identification, evaluation, and selection of WMS based on needs	Chapter 4

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1.2.7	Impacts of WMSs on key parameters of water quality and impacts of moving water from rural and agricultural areas	Chapter 5
1.2.7	Consolidated water conservation and drought management recommendations	Chapter 6
1.2.7	Description of how the RWP is consistent with long-term protection of water, agricultural and natural resources	Chapter 7
1.2.7	Unique stream segments/reservoir sites/Legislative recommendations	Chapter 8
1.2.7	Report on water infrastructure funding recommendations	Not due until 1/6/2006
1.2.7	Adoption of RWPs	Chapter 10
<b>PART 2</b>	<b>Introduction to Regional Water Planning Data</b>	
2.1	Overview	
2.1	Access and update data in DB07 via the internet	RWP
2.1	Data in the final RWP cannot contradict DB07	RWP
2.2	General Requirements	
2.2	Water availability determined as the maximum amount of water from current source during DOR , after accounting for legal constraints and management philosophies	Chapter 3
2.2	Water supply determined as the volume of water for a WUG or WWP from existing and connected water sources as of January 1, 2002 or anticipated prior to end of current planning cycle	Chapter 3
2.2	Data submitted shall be accurate and the best available	RWP
<b>PART 3</b>	<b>Water Sources</b>	
3.1	Introduction	
3.1	Document all current water sources and their water availability	Chapter 3
3.1.1	Sources identified and quantified by county and basin location	Chapter 3
3.2.1	Sources not over-allocated on a permanent basis; Sum of supplies on county-basin basis does not exceed DOR availability	Chapter 3
3.2.2	Groundwater	Chapter 3
3.2.2	Calculated largest amount of groundwater that can be pumped annually without violating most restrictive physical, regulatory or policy condition	Chapter 3
3.2.2	TWDB's GAM used to determine groundwater availability	Chapter 3
3.2.3	Surface Water	Chapter 3

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3.2.3	Surface water availability for lakes and reservoirs reported as firm yield, TCEQ-permitted yield or operational supply	Chapter 3
3.2.3	Documented any modifications of input data set for WAM Run 3 to reflect return flows and changed conditions	Chapter 3
3.2.3.b	TCEQ's official WAM Run 3 used to determine firm yields of reservoirs	Chapter 3
3.2.3.c	Reservoir firm yield developed in accordance with eight criteria in 3.2.3.c as applicable	Chapter 3
3.2.3.d	TCEQ's official WAM Run 3 used to determine firm diversions from diversion sites	Chapter 3
3.2.3.e	Firm diversion developed in accordance with five criteria in 3.2.3.e as applicable	Chapter 3
3.3	Required Data Elements - Form 1	Chapter 3
3.3	RWP shall document the sources of information and methodologies used to estimate source availability values	Chapter 3
3.3	RWP shall list all water rights permit numbers for each availability source	Chapter 3
3.3	All water used by a WUG must be attributed to one or more sources	Chapter 3
3.3	DB07 Form 1 - Sources completed in accordance with Section 3.3 of Exhibit B	DB07
PART 4	`	
4.1	Introduction	
4.1	All required WUGs shall be included in the Water User Group Form	DB07
4.2.6	Water quality considered as a factor in evaluation of WMS	Chapter 4
4.2.6	Cost of water delivered and treated to end user requirements included for all potentially feasible WMS	Chapter 4
4.2.7.a	Conservation WMS that achieves the most practicable, achievable level of water conservation and efficiency included for each WUG or WWP that will obtain water from a new IBT	Chapter 4
4.2.7.b	Conservation WMS identified by type of measure, estimated savings, timeline and anticipated costs	Chapter 4
4.2.8.c	Use site-specific studies if available, if not the 1997 Consensus Criteria for environmental flows for WMS needing new permits	Chapter 4
4.2.9	Costs of Strategies	Chapter 4

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4.2.9	Calculation of debt service in accordance with Exhibit B	Chapter 4
4.2.9	Capital costs to include construction costs, engineering, land and easements, environmental, interest during construction, and purchased water cost (if applicable)	Chapter 4
4.2.9	Annual costs to include operations and maintenance, power cost, purchased water cost (if applicable), and debt service	Chapter 4
4.2.9	Total costs to be discounted and shown in terms of present value	Chapter 4
4.3	DB07 Form 2 - Water User Groups completed in accordance with Section 4.3 of Exhibit B	DB07
PART 5	<b>Data by Wholesale Water Providers</b>	
5.1	Introduction	
5.1	All WWPs must be included in the Wholesale Water Providers form	DB07
5.1	All the WWPs contractual or non-contractual obligations throughout the 50-year planning horizon must be included	Chapter 3
5.2.2	If a recipient shows a need, WWP must include a WMS to address that need	Chapter 4
5.3	DB07 Form 3 - Wholesale Water Providers completed in accordance with Section 5.3 of Exhibit B	DB07

**ATTACHMENT 7-2**