

Brazos G Regional Water Planning Area

2006 Brazos G Regional Water Plan

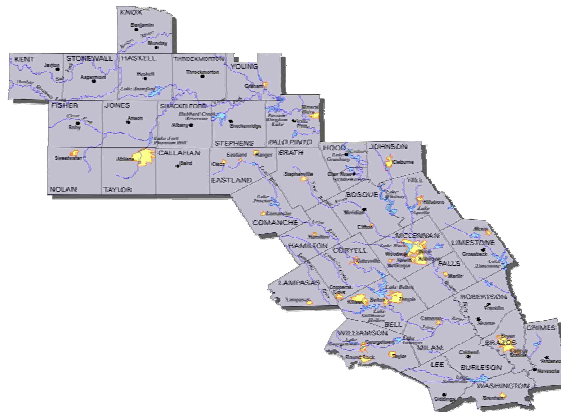
Volume II – Evaluations of Water Management Strategies

Prepared by:

Brazos G Regional Water Planning Group

With administration by:

Brazos River Authority



With technical assistance by:



HDR Engineering, Inc.

In association with:

Freese and Nichols, Inc.

R.W. Harden and Associates, Inc.

Hicks and Company, Inc.

Fletcher Communications

January 2006

Table of Contents

| <u>Section</u> | <u>Page</u> |
|---|--------------------|
| 4B Identification, Evaluation, and Selection of Water Management Strategies | 4B.1-1 |
| 4B.1 Water Management Strategies..... | 4B.1-1 |
| 4B.1.1 Evaluation of Strategies | 4B.1-1 |
| 4B.1.2 Plan Development Criteria..... | 4B.1-2 |
| 4B.1.3 Engineering | 4B.1-3 |
| 4B.1.4 Cost Estimates | 4B.1-4 |
| 4B.1.5 Methods Used to Investigate Environmental Effects of Proposed Regional Water Management Strategies | 4B.1-6 |
| 4B.1.6 Agricultural Water Management Strategies..... | 4B.1-7 |
| 4B.1.7 Water Conservation and Drought Preparation | 4B.1-7 |
| 4B.1.8 Funding and Permitting by State Agencies of Projects Not in the Regional Water Plan | 4B.1-8 |
| 4B.2 Water Conservation..... | 4B.2-1 |
| 4B.2.1 Municipal Water Conservation..... | 4B.2-1 |
| 4B.2.2 Irrigation Water Conservation | 4B.2-8 |
| 4B.2.3 Water Conservation for Industrial Uses..... | 4B.2-20 |
| 4B.3 Wastewater Reuse | 4B.3-1 |
| 4B.3.1 Direct Reuse..... | 4B.3-1 |
| 4B.3.2 Indirect Reuse | 4B.3-79 |
| 4B.4 System Operation of Brazos River Authority Reservoirs | 4B.4-1 |
| 4B.4.1 Availability of Water from the BRA System Operations | 4B.4-1 |
| 4B.4.2 Utilization of the BRA System Operations as a Water Management Strategy for Specific WUGs | 4B.4-3 |
| 4B.4.3 Effects of the Proposed BRA System Operations on Water Management Strategies Considered for the 2006 Plan | 4B.4-17 |
| 4B.4.4 Effects of Incorporating Water Management Strategies into BRA System Operations..... | 4B.4-19 |
| 4B.4.5 Effects of Including Existing Water Supply Sources as Part of BRA System Operations | 4B.4-22 |
| 4B.4.6 Summary of Hydrologic Findings Concerning the Proposed BRA System Operations..... | 4B.4-22 |
| 4B.4.7 Environmental and Implementation Issues..... | 4B.4-23 |

Table of Contents (Continued)

| <u>Section</u> | <u>Page</u> |
|---|--------------------|
| 4B.5 Groundwater/Surface Water Conjunctive Use (Lake Granger Augmentation)..... | 4B.5-1 |
| 4B.5.1 Description of Option | 4B.5-1 |
| 4B.5.2 Available Yield..... | 4B.5-1 |
| 4B.5.3 Environmental..... | 4B.5-2 |
| 4B.5.4 Engineering and Costing..... | 4B.5-2 |
| 4B.5.5 Implementation Issues | 4B.5-7 |
| 4B.6 Desalination..... | 4B.6-1 |
| 4B.6.1 Description of Options..... | 4B.6-1 |
| 4B.6.2 Desalination of Lake Granbury Water for Johnson County Regional Plan..... | 4B.6-1 |
| 4B.6.3 Brackish Groundwater Desalination for Northeast Johnson County | 4B.6-8 |
| 4B.7 Augmentation of Millers Creek Reservoir | 4B.7-1 |
| 4B.7.1 Description of Canal Option..... | 4B.7-1 |
| 4B.7.2 Description of Pipeline Option | 4B.7-15 |
| 4B.8 Aquifer Storage and Recovery (ASR)..... | 4B.8-1 |
| 4B.8.1 Seymour Aquifer in Knox and Haskell Counties | 4B.8-1 |
| 4B.8.2 Trinity Aquifer in Johnson County..... | 4B.8-14 |
| 4B.9 Brush Control and Range Management | 4B.9-1 |
| 4B.9.1 Description of Brush Control Strategy | 4B.9-2 |
| 4B.9.2 Brush Control in the Brazos G Area..... | 4B.9-6 |
| 4B.9.3 TSSWCB Brush Control Feasibility Studies | 4B.9-8 |
| 4B.9.4 Potential Brush Control Project | 4B.9-10 |
| 4B.9.5 Comparison of Findings to Other Studies..... | 4B.9-13 |
| 4B.9.6 Environmental Impacts of the Potential Brush Control Project..... | 4B.9-14 |
| 4B.9.7 Implementation Issues | 4B.9-18 |
| 4B.9.8 Conclusions..... | 4B.9-19 |
| 4B.10 Weather Modification..... | 4B.10-1 |
| 4B.11 Interregional Water Management Strategies | 4B.11-1 |
| 4B.11.1 Trinity River Authority Reuse Supply through Joe Pool Lake..... | 4B.11-1 |
| 4B.11.2 Regional Surface Water Supply to Williamson County from Lake Travis | 4B.11-7 |

Table of Contents (Concluded)

| <u>Section</u> | <u>Page</u> |
|--|--------------------|
| 4B.12 New Reservoirs | 4B.12-1 |
| 4B.12.1 Breckenridge Reservoir (Cedar Ridge Site) | 4B.12-5 |
| 4B.12.2 South Bend Reservoir | 4B.12-21 |
| 4B.12.3 Throckmorton Reservoir | 4B.12-37 |
| 4B.12.4 Double Mountain Fork Reservoir (East & West Sites) | 4B.12-51 |
| 4B.12.5 Turkey Peak Reservoir | 4B.12-75 |
| 4B.12.6 Little River Reservoir | 4B.12-91 |
| 4B.12.7 Millican Reservoir (Bundic Site) | 4B.12-129 |
| 4B.13 Off-Channel Reservoirs | 4B.13-1 |
| 4B.13.1 Introduction | 4B.13-1 |
| 4B.13.2 City of Groesbeck Off-Channel Reservoir | 4B.13-5 |
| 4B.13.3 Wheeler Branch Off-Channel Reservoir | 4B.13-23 |
| 4B.13.4 Peach Creek Off-Channel Reservoir | 4B.13-39 |
| 4B.13.5 Little River Off-Channel Reservoir | 4B.13-55 |
| 4B.13.6 Lake Palo Pinto Off-Channel Reservoir | 4B.13-71 |
| 4B.14 Interconnection of Regional and Community Systems | 4B.14-1 |
| 4B.14.1 Bosque County Regional Project | 4B.14-1 |
| 4B.14.2 West Central Brazos Water Distribution System | 4B.14-7 |
| 4B.14.3 Interconnection of City of Abilene System with City of Sweetwater | 4B.14-15 |
| 4B.14.4 Interconnection of City of Waco System with Neighboring Communities | 4B.14-21 |
| 4B.14.5 Interconnection of Central Texas WSC with Salado WSC | 4B.14-25 |
| 4B.15 Carrizo-Wilcox Aquifer Development | 4B.15-1 |
| 4B.15.1 Williamson County | 4B.15-1 |
| 4B.15.2 Brazos County | 4B.15-7 |
| 4B.16 Voluntary Redistribution | 4B.16-1 |

(This page intentionally left blank.)