

TWDB PROJECT NUMBER 98-483-246
TNP PROJECT NUMBER PCU97237

SOUTHEASTERN PARKER COUNTY REGIONAL WATER STUDY

1997-1998 RESEARCH AND PLANNING GRANT

FINAL REPORT

TO THE

TEXAS WATER DEVELOPMENT BOARD

APRIL 1999

FUNDED THROUGH THE

PARKER COUNTY UTILITY DISTRICT NUMBER 1

FUNDED BY

THE CITIES OF WILLOW PARK, ALEDO AND HUDSON OAKS
AND
THE COUNTY OF PARKER

WITH GRANT FUNDING BY THE

TEXAS WATER DEVELOPMENT BOARD

PREPARED BY

TEAGUE NALL AND PERKINS, INC.
915 Florence Street
Fort Worth, Texas 76102
(817) 336-5773



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ITP **TEAGUE NALL AND PERKINS**
INC. ENGINEERS ♦ SURVEYORS ♦ MUNICIPAL CONSULTANTS

April 29, 1999

Texas Water Development Board
1700 North Congress Avenue
P.O. Box 13231, Capital Station
Austin, Texas 78711-3231
Attn: Mr. Curtis Johnson, P.E.

RE: Final Report
Southeastern Parker County Water Study
Parker County Utility District #1
Proj. No. PCU 97237
TWDB Project 98-483-246

Dear Mr. Johnson:

Attached are copies of the final report entitled "Southeastern Parker County Regional Water Study". We have submitted 9 double sided copies and one photo ready original. This report has been a cooperative effort between the Cities of Aledo, Willow Park, Hudson Oaks, County of Parker, Parker County Utility District Number 1, and the Texas Water Development Board. A significant contribution of time, resources and assistance has also been provided by the Tarrant Regional Water District, the City of Weatherford, and the City of Fort Worth.

This study reviewed potable water options for the southeastern quadrant of Parker County for the next 30 years. The study includes the Cities/Towns of Aledo, Hudson Oaks, Willow Park, Annetta North, Annetta, and Annetta South, including a large area of unincorporated Parker County and with fringe impact on Fort Worth's extraterritorial jurisdiction (ETJ). A summary of the study results is shown in the "Executive Summary" section of this report.

The preliminary report was submitted to the TWDB in late December 1998. A public meeting presenting the report was held in early January 1999. TWDB comments were received in February. A copy of these comments are attached to this letter.

Modifications due to TWDB comments, other public comment, clarification, or correction, have been incorporated into the final report. These are generally summarized as follows:

- A.) The Texas Water Development Board made comment that the report used excessively high figures for population projections. The figures used were based generally on the North Central Texas Council of Governments annual projections since 1990 (COG 8 Yr) which include both a low growth period and a high growth period. Due to Board comment, and possible impacts to other studies being performed for Region C, the population figures have been adjusted to approximate the TWDB High projections of population growth.

- B.) The Texas Water Development Board made comment that the water use calculations were excessive and did not include water conservation. The projections used for sizing facilities were based on TNRCC minimums for sizing treatment and distribution facilities. However, such figures are not representative of average daily flows which would be used for the purchase of raw water and for evaluating average demands. Therefore, where necessary, distinctions have been made in the report and adjustments made. Average daily use figures for a number of Texas cities, which were provided by TWDB, have been included in Appendix E. Entries have also been made in Table 13.1.a, to reflect such information.
- C.) Several statements were made in the report which were questioned by outside reviewers and resulted in the following report modifications;
- 1.) ABILITY OF TRWD TO SELL TREATED WATER: Chapter 17, Page 2 of 15, stated near the end of the fourth paragraph that "Also, the agreement prevents TRWD from selling treated water". The contract provision in the 1982 settlement agreement does not prohibit TRWD from selling treated water, but does prohibit it from treating and selling treated water as part of the "system" defined in the settlement agreement. Therefore, TRWD would have to establish a separate, self-supporting enterprise should it ever decide to offer treated water sales. Other report comments with similar statement or inference have also been corrected.
 - 2.) COST OF CREATING PCUD#1: Table 18.7, Chapter 18, Page 5 of 8 indicated that it cost the City of Springtown and Walnut Creek SUD over \$100,000 for the creation of Parker County Utility District Number 1. At the time of the preliminary report, this was an approximate value derived in discussions with Springtown. Since that time, Springtown has submitted an itemized review in which \$86,000 was spent on studies, engineering (including CCN issues), legal and legislation to create the District. Additional funds were spent by Walnut Creek SUD for legal and other services, however, the exact amount spent by WCSUD has not been provided to me. Therefore, the reference to district creation has been modified to show \$80,000+. This should be a conservative, non-controversial number.
 - 3.) CHANGES IN APPENDICES: Concern was expressed regarding the "build-out" projections used in the appendices. These seemed to cause some confusion. As such, the calculation tables were redone and the appendices rearranged to include relevant data with each scenario. Hopefully, the revised format will be easier to follow.
 - 4.) MODIFICATION OF SCENARIO 2 FOR TREATED SURFACE WATER: The two scenarios shown were confusing in that the second one was a "bare bones" approach and did not provide the same level of service as the first scenario. As such, the second scenario has been replaced with a similar option affording the same level of service as Scenario 1.

- 5.) ADDITION OF STUDY SPREADSHEET (ELECTRONIC FORMAT): The original study was performed utilizing a rather large Quattro Pro spreadsheet. Due to numerous requests, this spreadsheet has been converted to Microsoft Excel and has been included on a floppy disk attached to the report.
- 6.) WATER CONSERVATION: Due to the nature of this report, a water conservation plan has not been attached. The contractor for the report is Parker County Utility District Number 1, which does not currently offer water service. However, PCUD#1 and all participating cities are aware that they will have to complete a water conservation plan before, or in conjunction with, any TWDB capital funding of projects. At present, the City of Hudson Oaks is almost complete with their water conservation plan and drought contingency plans were enforced in Aledo, Willow Park and Hudson Oaks during the summer of 1998. In addition, this report recommends the pursuit of surface water from the Tarrant Region Water District. This district has recently adopted a revised water conservation plan which will set minimum requirements for any existing and potential customers.
- 7.) PHASING: Originally the treated surface water options were phased into a small number of discrete phases. This has been optimized to allow for more continuous upgrading with discrete 10 year financing packages.

As this report is being submitted, the Cities of Aledo, Hudson Oaks, Willow Park and the County of Parker have established a committee to review and prioritize options for regionalized service which will then be submitted to the various City Councils and Commissioners Court, as needed, for action. All participants now appear to agree that well service for area utilities should be phased out and treated water from Lake Benbrook sought. Present considerations include joining the Parker County Utility District No. 1 as a member entity, contracting for service with the Trinity River Authority or creating a new general law district for the southeastern Parker County area. However, initial indications show that a new regional entity may be difficult to obtain with regional entities already in the area.

As mentioned above, the TWDB review comments have been attached to this letter. A listing of specific edits since the preliminary report is also attached.

Thank you for your assistance and support regarding this report. Should you have any questions, please call me.



Sincerely,
TEAGUE NALL AND PERKINS, INC.

J. Kelly Carta
J. Kelly Carta, P.E.

Attached: Copy of TWDB Review Letter
Report (9 bound copies and 1 unbound original)



TEXAS WATER DEVELOPMENT BOARD

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February 9, 1999

Mr. Allan G. Swan
Board Chairman
Parker County Utility District No. 1
c/o City of Springtown
P.O. Box 444
Springtown, Texas 76082

Re: Review Comments for Draft Report Submitted by the Parker County Utility District No. 1, TWDB Contract No. 98-483-246

Dear Mr. Swan:

Staff members of the Texas Water Development Board have completed a review of the draft report under TWDB Contract No. 98-483-246. As stated in the above referenced contract, the District will consider incorporating comments from the EXECUTIVE ADMINISTRATOR shown in Attachment 1 and other commentors on the draft final report into a final report. The District must include a copy of the EXECUTIVE ADMINISTRATOR's comments in the final report.

The Board looks forward to receiving one (1) unbound camera-ready original and nine (9) bound double-sided copies of the Final Report on this planning project. Please contact Mr. Curtis Johnson, the Board's Contract Manager, at (512) 463-8060 if you have any questions about the Board's comments.

Sincerely,

A handwritten signature in cursive script that reads "Tommy Knowles".

Tommy Knowles
Deputy Executive Administrator
Office of Planning

cc: Kelly Carta, Teague Nall and Perkins
Curtis Johnson, TWDB

**ATTACHMENT 1
TEXAS WATER DEVELOPMENT BOARD**

**REVIEW COMMENTS: PARKER COUNTY UTILITY DISTRICT NO. 1
Contract No. 98-483-246**

Staff has reviewed the draft report Southeastern Parker County Regional Water Study. The following are staff comments:

Population:

The consultants developed ultimate populations for each identified entity based on full development of the land area associated with each entity. These projections are much higher than the Board's most likely projections for the Cities of Weatherford, Hudson Oaks, Willow Park, and Aledo. These projections are also higher than the Board's high growth scenario for these cities. The Board does not have population projections for Annetta South or Annetta North. If these population projections are anticipated to be used in the Senate Bill 1 regional water plan, be advised that any request to revise the Board's population projections must be made by the regional water planning group and must comply with the Board's criteria and data requirements. Additionally, requests for revising the Board's population projections will be reviewed by staff of the Texas Water Development Board, Texas Natural Resource Conservation Commission, and Texas Parks and Wildlife and must be approved by the six members of the Texas Water Development Board.

Water Demands:

The projected water demands for the entities identified in the report are based on the 0.6 gallons per minute which is a system criteria. This system criteria is substantially higher than the actual water use of the entities. Per capita use (average gallons per person per day) is a more typical statistic for describing water use. For example, the City of Weatherford's historical per capita water use over the period 1980-1996 has never approached the per capita use calculated from the population data and projected water demand presented in Appendix F -16.

Year	Per Capita Use	Per Capita Use (Based on 0.6 gpm)
1980	185	1998 - 362
1985	110	2000 - 337
1986	92	2010 - 342
1987	99	2020 - 335
1988	99	2030 - 329
1989	140	2040 - 322
1990	123	
1991	129	
1992	132	



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 Walter H. Madden, Jr., *Member*

March 16, 1999

Mr. A. G. Swan
 Board Chairman
 Parker County Utility District No. 1
 c/o City of Springtown
 P.O. Box 444
 Springtown, Texas 76082

Re: Time Extension for Regional Water Supply and/or Wastewater Planning Contract
 Between the Parker County Utility District No. 1 (District) and the Texas Water
 Development Board (Board), TWDB Contract No. 98-483-246

Dear Mr. Swan:

This is a board initiated for a time extension for the delivery of the Final Report for above referenced contract. This letter will represent a contract amendment that will change the date for the Final Report Deadline and expiration of the contract from **March 31, 1999** to **April 30, 1999**. All other terms of the contract will remain unchanged.

Please indicate your concurrence with these revised dates by signing below. Retain a copy for your files, fax the executed original to (512) 463-9893 at your earliest convenience. Please return the original letter to the attention of the Research and Planning Fund Grants Management Division at the address shown below by **April 15, 1999**. If you have any questions concerning the contract, please contact Mr. Curtis Johnson the Board's designated Contract Manager, at (512) 463-8060.

Sincerely,

Tommy Knowles, Ph.D., P.E.
 Deputy Executive Administrator
 Office of Planning

PARKER COUNTY UTILITY DISTRICT NO. 1

Mr. Waymon Wright *AGSWAN*
 Board Chairman

Date: 4-6-99

cc: Curtis Johnson, TWDB

V:\RPFM\AMEND\98483246.x3.doc

Our Mission
 Provide leadership, technical services and financial assistance to support planning, conservation, and responsible development of water for Texas.

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 URL Address: <http://www.twdb.state.tx.us> • E-Mail Address: info@twdb.state.tx.us

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LIST OF EDITS

(Report modifications since the submittal of the Preliminary Report)

CHAPTER/SECTION	MODIFICATION
Cover Sheet	Changed "Preliminary" to "Final" Modified date Changed fonts and background
Cover Letter	Added Cover Letter Added List of Edits Added copy of TWDB review comment letter
Table of Contents	Added Table 13.1.a, TWDB Large City Average Use Comparison
Chapter 1 - Acknowledgements	Minor grammatical corrections
Chapter 2 - Executive Summary	Corrected reference to Appendix B in item 2 Replaced the term "Options" with "Scenarios" when dealing with treated water system comparisons Edited descriptions of treated water scenarios to reflect modifications noted in cover letter
Chapter 3 - Definitions and Terms	
Chapter 4 - Introduction	
Chapter 5 - Study Participants	Fort Worth and Weatherford properly listed as Other Active Participants to reflect their active role(s) in the study
Chapter 6 - Background	Reference to Appendix K changed to Appendix F References to final public meeting (#3) updated
Chapter 7 - Prior Studies	
Chapter 8 - Study Methodology	Appendix I correctly referenced Noted that TWDB population data was utilized, where available Under Item 8 of "Entity Growth" the assumption for Fort Worth services was modified to be consistent with the remainder of the report Costs have been modified to either reflect either "current" or 1999 dollars since this final report is being issued well into 1999. Facility sizing based on TNRCC minimums, raw water consumption based on average daily flows and any references to larger usages deleted Disclaimer added regarding finance packages Interest and inflation rates under "Economic Methodology" corrected to be consistent throughout the section.

Chapter 9 - Geographic Considerations	Added mention of other TRWD system lakes
Chapter 10 - Service Histories	Added note on county population Note on Chico revised Text modified to correctly state that Hudson Oaks is still in the process of connecting its separate water systems. Other private utility systems besides Deer Creek recognized
Chapter 11 - Population	Reference changed from Appendix D to Appendix I Table 11.1 modified to reflect lower population curves Tables 11.2 and 11.3 eliminated with relevant information combined on Table 11.1
Chapter 12 - Entity Boundaries and Growth	
Chapter 13 - Water Supply and Use	Changed reference from Appendix L to Appendix G Edited Table 13.1 to reflect use data from TWDB and deleted questionable Fort Worth 1989 numbers Replaced Tables 13.3 and 13.4 with Average and Design demand tables
Chapter 14 - Economic Considerations	
Chapter 15 - Option 1, Wells	Table 15.1 replaced with revised well demand table
Chapter 16 - Option 2, Purchase Treated Water	Clarified TRWD's ability to sell treated water
Chapter 17 - Option 3, Treat Raw Surface Water	Properly referenced Appendix B Deleted incorrect statement about TRWD's ability to sell treated water. Updated window of availability for legislation. Deleted tables/maps 17.2 through 17.13 and replaced with Tables 17.2 through 17.6 for summaries and references to the appendices and spreadsheet
Chapter 18 - Recommendations	Corrected statements regarding TRWD's ability to sell treated water Table 18.3 - corrected statement regarding Weatherford resale of TRWD raw water Table 18.7 - corrections to TRWD's treated water abilities Table 18.7 - update of legislation options
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Appendix D - Population History and Projections	Appendix D is now "Current Supply and Treatment Data"
Appendix E - Current Supply and Treatment Data	Appendix E is now "Cost Factors"
Appendix F - System Buildout Projections	Appendix F is now "Meeting Summaries"
Appendix G - Pipe Information	Appendix G is now "Newspaper Articles"
Appendix H - Cost Factors	Appendix H is now "Case Study"
Appendix I - Treatment Plant Scenario 1	Appendix I is now "Population Figures and Charts"
Appendix J - Treatment Plant Scenario 2	Appendix J is now "TWDB Water Use Data"
Appendix K - Meeting Summaries	Appendix K is now "Land Area and Well Use"
Appendix L - Newspaper Articles	Appendix L is now "Option 3 - Scenario 1"
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ACKNOWLEDGMENTS

This study could not have been accomplished without a tremendous amount of support and cooperation from a number of people and entities. It is the culmination, in part, of efforts conceived by the Parker County Economic Development Committee in 1996-1997. Member entities of this committee recognized a need to address utility issues as the primary element in attracting (and coping with) development and growth in Parker County. In particular, the members in southeastern Parker County noted that growth was already proceeding rapidly in their quadrant making water quality, availability, and distribution the primary concerns in dealing with and maintaining the growth. Since the area is currently served by a number of small public and private systems, each depending on well water, the committee expressed an interest in exploring joint or regional systems with an alternate water supply. Three cities in the area (Hudson Oaks, Aledo and Willow Park) began to explore the possibility of studying the problem with the County of Parker. Ultimately, it was decided in the fall of 1997 to pursue assistance from the Texas Water Development Board for the study and to contract with the newly formed Parker County Utility District Number 1, a regional entity based in Springtown, to be the lead agency for the study.

Great effort has been expended to make this study a success and to determine the best path for the water destiny of the area. First and foremost, recognition goes to those who were willing to fund such an effort, primarily the Texas Water Development Board (without their support and grant participation this study could not likely have been undertaken), the City of Willow Park, the City of Aledo, the City of Hudson Oaks and the County of Parker. Also, special thanks goes to the Parker County Utility District Number 1, a Special Law district formed in 1997, that agreed to administer the project and was "cutting its teeth" as a District in performing this project. Thanks also goes to the City of Annetta South who attended organizational meetings and offered much needed encouragement and cooperation to promote pursuit of the study and to the Cities of Annetta and Annetta North who participated in and contributed to the study efforts. Acknowledgment goes to a number of participating water supply corporations and other groups, including Dyegard Water Company, Highland Water Supply Corp., Treetop Utilities Inc., Bluebonnet Hills WSC, Spring Valley Water Company, Central Texas Utilities, Abraxas Utilities, and Severn Trent Environmental. Special acknowledgment goes to those entities who are not in the study effort but participated either as an advisory, reference or future partner role. These include the Tarrant Regional Water District, the City of Fort Worth, the City of Weatherford, the North Central Texas Council of Governments, and the Texas Natural Resource Conservation Commission.

EXECUTIVE SUMMARY

This study explores options available for providing water during the next 30 years to six incorporated communities and surrounding unincorporated areas in southeastern Parker County, Texas. The study includes the cities and towns of Hudson Oaks, Willow Park, Aledo, Annetta, Annetta North and Annetta South.

At present, the population in the area is served by small municipal distribution systems, water supply corporations, or private individual wells. As the area is squeezed from the east by the Dallas-Fort Worth metroplex and from the west by the City of Weatherford, there is a concern that current systems cannot keep up with the demands of urbanization.

At present, all of the area is served by groundwater (wells) in the form of municipal systems, private utility systems, and personal wells. The population of the area is growing rapidly and must expand water service in the next few years. The report can be summarized as follows:

- 1.) The long term continued use of well water is probably not reliable due to overmining of the aquifer as a result of population growth.
- 2.) Treated surface water is not currently available. Neither the City of Fort Worth nor the City of Weatherford currently has the resources or interest to serve the area. (See Appendix B - Response letters from other entities).
- 3.) Available raw water sources near the study area are controlled by the Tarrant Regional Water District (TRWD). Raw water is available for purchase from nearby Lake Benbrook. Lake Benbrook is a terminal storage reservoir for east Texas water pumped by TRWD from Richland-Chambers and Cedar Creek reservoirs.
- 4.) The City of Weatherford currently has a purchase contract with TRWD to purchase supply from Lake Benbrook, to augment the City's current supply from Lake Weatherford. At present, Weatherford is in the final planning phase for completing a raw water transmission facility and line from Lake Benbrook to Lake Weatherford. The line will cross through the study area and should be complete in 2-3 years.
- 5.) The study area is in the recently created Region C water region created by the 1997 Senate Bill 1 for water planning and drought response.
- 6.) The report shows that there are benefits in regionalizing the raw water transfer, treatment and wholesale distribution of water from Lake Benbrook to the affected study cities.
- 7.) The report shows that there could be additional benefits in a mutual arrangement with Weatherford regarding transmission of raw water from Lake Benbrook to the proposed plant site.
- 8.) Several options for effecting regionalization are discussed, including working with an existing regional level entity or creating a subregional group entity. However, the

report notes a number of items that may need to be addressed prior to a final decision as to who, or how, the regional/subregional entity should be structured. At present, it appears that the use of an existing entity would be most expeditious and beneficial.

- 9.) The report results review the following two service options (scenarios) for the initial phase(s) of the project which would provide treated surface water to Willow Park, Aledo and Hudson Oaks (the initial areas of concern). Please note that costs shown in the report are somewhat generic are only good for comparison purposes and order of magnitude.
 - A.) The entities of the study area, or their regional representative, contribute to the oversizing of the raw water transmission line currently being constructed by Weatherford, construct a 2 MGD treatment plant and provided distribution piping to each entity which would allow for some growth. It is anticipated that such water service could be available to the study area cities by the end of 2005.
 - B.) The entities of the study area, or their regional representative, acquire new right-of-way from Lake Benbrook to the plant, including a separate intake structure, transmission main and pumping. The remaining 2 MGD plant and distribution piping would remain as in scenario 1.
- 10.) Several legal hurdles may need to be addressed which could expedite water agreements and service. First, it might be beneficial for TRWD's Advisory Committee to modify their contract with Weatherford to allow Weatherford to resale raw water. Second, it might be beneficial to pursue contract and operations modifications which would allow TRWD to sell treated water, as well as raw water. Several other legal issues are discussed in the report.

This report focuses on determining available options to meet future water demands in the study area. These include the continued dependency on well water, the purchase of treated water from a neighboring entity, the purchase of raw surface water from a neighboring entity, or a combination of these. In addition, a review was conducted as to whether such options should be pursued individually by each city, by groups of cities or by a regional entity representing all cities participating in the study.

This report shows that the long term dependency on well water as a sole source is not promising for a number of reasons. To obtain and distribute treated water from another entity, the two logical choices are the City of Fort Worth and the City of Weatherford. At present, neither entity indicates an ability or willingness to service the area. All readily available raw surface water sources (with the exception of Lake Weatherford, which is owned by the City of Weatherford and currently does not have excess capacity) are controlled by the Tarrant Regional Water District. Tarrant Regional Water District (TRWD) currently controls and/or utilizes the near-by lakes of Eagle Mountain, Bridgeport, Lake Worth, Lake Arlington, Richland Chambers Reservoir, Cedar Creek Reservoir and Lake Benbrook. At present, TRWD is proposing future use from Lake Tehuacana, Parkhouse Reservoir and Marvin Nichols Reservoir. TRWD supplies raw water to Fort Worth, Arlington, Mansfield and Trinity River Authority (TRA) water treatment plants. Other smaller entities have contracts to purchase water from TRWD's reservoirs. Currently, Weatherford has a contract with

TRWD for the purchase of raw water from Lake Benbrook but has not completed the water transmission main necessary to pump raw water back to Weatherford's plant. Weatherford is currently in the process of incrementally constructing the line from Lake Benbrook to Lake Weatherford. This line will pass through the middle of this study area in a generally southeast to northwest direction. In addition, TRWD is utilizing Lake Benbrook as a leveling reservoir receiving water from other lakes (Cedar Creek and Richland/Chambers reservoirs). This increases the dependability of Lake Benbrook as a future water supply source. Therefore, it appears that the best choice would be for the study cities to start reducing their dependency on well water and start utilizing surface water from Lake Benbrook.

Tarrant Regional Water District has indicated that agreements could probably be reached in acquiring raw water from Lake Benbrook, however it does not currently supply treated water. Also, its current agreements with Fort Worth, Arlington, Mansfield and TRA appear to preclude TRWD from treating water in its current system or in assisting with the construction of a raw water pipeline from Lake Benbrook to the study area. In addition, Weatherford's contract with TRWD will not allow them to wholesale treated water to other utilities, if such water was purchased as raw water from TRWD. Weatherford has indicated an interest in working with the cities in the study area through TRWD to install joint transmission facilities for raw water from Lake Benbrook, but has recently expressed concern that they may need to complete their transmission line within the next few months due to increased water supply requirements caused by recent growth and demands experienced during the extremely hot summer of 1998.

Even if raw water can be obtained and transported to the study area, the issue remains as to how the water will be treated and distributed. At present, many of the cities and towns in the study area are already distributing well water and will need to maintain some level of water billing to support the maintenance and upgrade of their distribution systems. These cities are not interested in selling their system to a retail provider, but are looking for a wholesale source of treated water. Willow Park and Aledo have currently privatized the daily operation of their systems by a contract with Severn Trent Environmental. Hudson Oaks has previously contracted such services but currently uses in-house staff to run their system. Also, there are several privately owned systems bordering Hudson Oaks. By and large, the three Annettas do not offer city wide water, therefore water is produced either by private wells or small, private water systems. One private system, Deer Creek, services a large subdivision which includes parts of Annetta and Annetta South. In general, none of the study cities and towns have a large, dedicated water utility workforce currently capable of running a surface water treatment plant. This would mean that operating a water treatment plant would be a rather large step for any of these cities, thereby making it impractical for each city, or small groups of cities, to operate their own facilities. In addition, since no treatment plants currently exist, the construction of a large, single plant would be more cost effective than building a series of smaller plants. This is especially true since all cities would need to go to the same location to acquire raw water. Unless transmission lines are duplicated, the piping system from source to user will essentially be identical regardless of where along the piping route the treatment process takes place. Therefore, it is recommended that all of the study area cities work together to obtain a single treatment source from which each obtains treated water at wholesale, then retails it through their own existing and upgraded systems.

At issue, however, is who will treat and transmit/distribute the raw and treated water. Several options exist. The first is for TRWD to own and operate the raw water and treatment facilities, then to wholesale the treated water. This would be the preferred option since TRWD already controls the raw water supply and has a long history as a water provider. However, as previously noted,

TRWD does not currently treat water and legally may be prohibited from doing so under current agreements with its principal customers (referred to as the Initial Contracting Parties in the written agreement). To date, TRWD has not shown a strong interest in getting into the "treated water business", especially in the short term. Therefore, an alternate regional approach may be necessary for the treatment of water.

Such an alternate provider would be a utility district responsible for obtaining raw water from TRWD, treating it, and selling it to member cities and water utilities. Unfortunately, the creation of such a district is costly and time consuming. The recently created Parker County Utility District #1 was created by legislative action (which can happen only during a 5-6 month window every two years) and cost over \$80,000 just for establishment. Such a district could be created to serve this area, should member cities desire to spend the time and funds for creation.

Another possibility would be for the cities to create a joint system simply by interlocal agreement. However, for this system to work well, one of the cities would need to become a lead entity to effectively leverage the cost of the system. Therefore, one city would essentially own and operate the treatment system and secure bonds and loans. The remaining cities would provide internal infrastructure and funding via interlocal agreements. Unfortunately, none of the cities in the study area are "home rule" cities nor does any appear to have the in-house financial or technical expertise to take this strong lead roll.

Another option would be for the Parker County Utility District #1 (PCUD #1) to formally expand its boundaries to include this study area and have all of the study cities become members of this existing district. Given that PCUD #1 provides the most palatable route for organizing and funding this study, this option could be beneficial. Also, this option seems to have support from PCUD#1, TRWD and many of the study cities. However, this District is new and still has not established a "track record" for constructing projects and offering service. At present, the District's primary concern for the next five years has been wastewater service for the Walnut Creek watershed in northeastern Parker County. Even so, this option currently seems to have the most promise for addressing the needs described in this study.

In summary, this report suggests that the best option available, considering relevant factors, is for an existing regional utility entity to contract with the TRWD for raw water, to partner with the City of Weatherford in transporting the raw water, to construct a regional plant in the vicinity of the geologic ridge north of Aledo and to provide wholesale treated water to member cities and utility providers within the study area. The first sales of treated water from this system will need to be available to the study cities within the next 5-10 years based on current growth patterns and well demands. The overall cost for such a system during the next 30 years is projected to be approximately \$70 million with the first phase to cost approximately \$22 million (as expressed in 1999 dollars) in order to partner with the City of Weatherford to transport raw water, then to build a treatment plant, facilities and lines to serve Willow Park, Aledo and Hudson Oaks. Additional upgrades and service to new areas would take place after completion of the first phase.

Other options and issues are also discussed in this report. These include potential utilization of other entities and the potential changing of some of the current legal constraints which would allow other entities more flexibility in participating in solutions to treatment and service issues.

DEFINITIONS AND TERMS

ACRONYMS

The following acronyms are used in this study:

- BWSA - Benbrook Water and Sewer Authority
(A water and sewer authority created to supply these services to the City of Benbrook, which does not supply such services itself.)
- CCN - Certificate of Convenience and Necessity
(A certificate issued by the TNRCC to allow a specified utility service in a specified service area.)
- CDM - Camp Dresser and McKee, Inc.
(An engineering firm which performed recent water studies for the City of Fort Worth.)
- CEDRAS - Center for Economic Development Research and Service
(An urban research group at the University of Texas at Arlington)
- CPI - Consumer Price Index
(A federal government index for cost comparisons issued at various points in time. It is used for comparing and projecting costs over time.)
- ENR - Engineering News Record
(A monthly publication devoted to engineering and construction issues which periodically publishes cost comparison indices focused on construction activities.)
- ETJ - Extra-Territorial Jurisdiction
(A geographic boundary outside of a city's limits in which it has limited powers of governance. See below.)
- GPCD or gpcd- Gallons per Capita Day
(A common measurement of individual water consumption denoting the number of gallons used by each person during a 24 hour period.)
- GPD or gpd - Gallons per Day
GPM or gpm - Gallons per Minute
(Common measurements of water flow.)
- HDR - HDR Engineering, Inc.
(An engineering firm recently providing planning documents on water conservation for the TRWD.)

- IOU - Investor Owned Utility
(A privately owned water utility company supplying a designated area for profit.)
- ISO - Insurance Services Offices, Inc.
(A private actuary service which publishes standards for various insurance services and costs. Texas is currently replacing fire Key Rates with the methods nationally used by ISO in determining fire insurance premium costs.)
- MGD or mgd - Million Gallons per Day
(A common measurement of bulk water flows during a 24 hour period.)
- MSL - Mean Sea Level
(The average level of the ocean used as a base in determining vertical elevations, or geographic heights, in the United States.)
- MUB - Municipal Utility Board
(A subset of the City of Weatherford responsible for oversight and operation of the city's utility systems including water, sewer and electricity. Technically, the Board reports to the City Council, however, by definition, a number of Council members have seats on the Board.)
- NCTCOG - North Central Texas Council of Governments
(An intergovernmental group servicing the Dallas-Fort Worth area which performs standardization and research services for its member cities. In particular to this study, NCTCOG performs annual population estimates for the cities in its jurisdiction.)
- NGS - National Geodetic Survey
(A federal agency/organization which has been responsible for establishing survey benchmarks (locations and elevations) monuments across the country based on MSL. It is a companion of the USGS (United States Geological Survey) which also performs similar functions.)
- PCUD#1 - Parker County Utility District Number 1
(A special law utility district for wastewater and water services created by the State Legislature in 1997. PCUD#1 was responsible for administering this study.)
- TAC - Texas Administrative Code
(A state compilation and coding of governing state laws enacted by the State of Texas.)
- TCWCID#1 - Tarrant County Water Control and Improvement District Number 1
(The previous name of the Tarrant Regional Water District. See below.)
- TDWR - Texas Department of Water Resources
(A predecessor of the TWDB and TNRCC. See below.)

- TNP - Teague Nall and Perkins, Inc.
(A Fort Worth based civil engineering firm responsible for the preparation of this water study.)
- TNRCC - Texas Natural Resource Conservation Commission
(A Texas state regulatory agency responsible for licensing and oversight of many utilities in Texas, including water. TNRCC is also involved in other activities, including regulation of many environmental impacts in Texas.)
- TRA - Trinity River Authority
(A water and sewer authority based in Dallas responsible for master planning activities for the Trinity River. Its boundaries extend from Tarrant County downstream to the Gulf of Mexico. TRA serves some areas of eastern Tarrant County, among others, with wholesale water and wastewater service. TRA is one of the major raw water purchasers from TRWD.)
- TRWD - Tarrant Regional Water District
(A regional water district responsible for maintaining raw water supplies to the Tarrant County area. TRWD was formerly TCWCID#1. TRWD has raw water storage and transportation facilities in a number of northern Texas counties.)
- TWDB - Texas Water Development Board
(A Texas state agency responsible for monitoring and planning adequate water supply, storage, conservation and quality for Texas. One of the major focuses of the TWDB is assisting other entities within the state in financing, planning, construction and upgrade efforts. TWDB provided significant grant funding for performing this study.)
- USACE - United States Army Corps of Engineers
(A construction branch of the federal government responsible for the building and operation of a number of lakes in Texas, including Lake Benbrook.)
- UTA - The University of Texas at Arlington
(One of the major universities in the Dallas-Fort Worth area. UTA is the home of CEDRAS and the Institute of Urban Studies which performed a recent economic development study for Parker County.)
- WCSUD - Walnut Creek Special Utility District
(A water district which treats water purchased from the TRWD and serves a large part of the northern Parker County and southern Wise County area with treated water at the retail level.)
- WSC - Water Supply Corporation
(A specific, not for profit, corporation responsible for supplying potable water to a specific area. WCSUD was a WSC prior to becoming a district.)

ENTITIES, BOUNDARIES AND TERMS:

This study encompasses the southeastern quadrant of Parker County in the State of Texas. Within this study area are several entity types, boundaries and terms which are discussed in this report. Some of these are as follows:

Agency - A bureaucratic entity of government established to perform certain services. The Texas Water Development Board (TWDB) has been empowered to study and assist other entities in implementing solutions to water problems within the state. The Texas Natural Resource Conservation Commission (TNRCC) is responsible for regulating water utilities in Texas. The North Central Texas Council of Governments is a representative agency of local governments established to provide planning and support services in the North Central Texas area.

Amendatory Contract - The resulting contract between TRWD and its four Initial Contracting Parties signed after its settlement agreement regarding Richland/Chambers reservoir in the early to mid 1980's. (See Appendix C.)

Certificate of Convenience and Necessity - A "license" issued by the Texas Natural Resource Conservation Commission granting an entity the right to serve a certain utility within a certain land area. In most cases, this is an exclusive right. The license holder can be either a public or private utility. Cities can serve within their city limits without a CCN if a prior CCN does not already exist for the area. For this study, Aledo, Willow Park, Hudson Oaks, Weatherford, and Fort Worth have CCN's to serve water. In general, the CCN boundaries do not currently coincide with the city limits of these cities. Also, a number of private utility services possess CCN's which overlap into cities within the study area.

City/Town - A city is an incorporated subdivision of the state. A city is run by an elected group of councilmen, aldermen or commissioners led by a mayor. In Texas, smaller cities (less than 5000 population) are "general law" and governed by state statutes. Larger cities are generally "home rule" and have more latitude in defining their own statutes. Each city has a defined corporate boundary (City Limit) which can only be modified by annexation. Each city is allowed to annex up to 10% of their existing land area per year. Cities can also provide water service within their corporate boundaries for all areas in which a prior CCN does not exist. Willow Park, Hudson Oaks, Aledo, Annetta North, Annetta and Annetta South are cities and towns currently located in the study area with Weatherford and Fort Worth just outside of the area.

County - A county is a political and geographic subdivision of the state. It has its own government led by the County Judge and County Commissioners, who are elected. The County is generally responsible for public infrastructure in areas where other entities (such as cities and utility districts) do not have jurisdiction. This infrastructure is most often focused on roadways, public safety and approval of subdivisions within unincorporated portions of the county. A county has the ability to tax. This study is completely in Parker County, but borders Tarrant County to the east and Hood County to the south. This area is the bulk of Parker County Precinct 4.

District - This is a state political subdivision, other than a municipality, which has a right to acquire a CCN and serve retail utilities within its boundaries. Often, it can also contract with

entities beyond its boundaries to provide wholesale service. Districts often serve cities. The Parker County Utility District Number 1, which is the umbrella agency for this study, can wholesale wastewater/water by contract to its customer entities. The Tarrant Regional Water District (TRWD) has the authority to capture, transport and sell raw surface water.

Extra-territorial Jurisdiction (ETJ) - Each city has a fringe boundary around the city in which it shares aspects of subdivision control with the county. This area is a buffer zone for annexation. The size of the ETJ offset outside each city limits is determined by state statutes based on city population. The six cities/towns within the study area each have an ETJ offset of one half mile outside of their city limits. Weatherford is allowed an ETJ of one mile and Fort Worth has an ETJ of five miles. Due to the proximity of the cities in and around the study area, many of these ETJ's overlap and conflicts will need to be resolved prior to successful annexation of much of the study area. The actual resolution to ETJ conflicts is made by either researching the historical progression of overlap (with "first come, first served") or by a mutually agreed boundary between the conflicting cities. It is **NOT** the purpose of this study to assign these boundaries or to "second guess" the actual progression of annexations, boundary negotiations and disputes. However, some ultimate city limit boundaries were required to perform the calculations in this study. To perform this study, probable maximum city limits were assumed based on known parameters. Please note that the ultimate limits shown on the maps contained herein may not, and probably will not, conform with the eventual, ultimate boundaries. However, in all likelihood, the amount of ultimate area for each city, and thus its projected population and water needs, should be reasonable.

Initial Contracting Parties - The four major raw water customers of the Tarrant Regional Water District as stipulated in the Amendatory Contract of the Settlement Agreement. The Initial Contracting Parties are the City of Fort Worth, City of Arlington, City of Mansfield and the western division of the Trinity River Authority.

Metroplex - A common name for the entire Dallas-Fort Worth area, generally covering Dallas, Tarrant, Denton and Collin Counties, along with portions of neighboring counties.

Settlement Agreement - See "Amendatory Contract" and "TRWD Settlement Agreement"

State - For the purpose of this report, a state is a political and geographical subdivision of the United States of America with the sovereignty to govern itself on matters which are not governed by the Federal government. This report deals with an area in the State of Texas.

Study Area - The area included in this study which is generally the southeastern quadrant of Parker County, Texas in the north central portion of the state.

Subdivision - A subdivision is the division of land from a single tract into multiple tracts, parcels or lots. For the common use used in this report, subdivisions involve the dividing of a large piece of land (by plat) for sale to a number of potential buyers. Usually, the subdivision includes the need for public infrastructure (roads, utilities, etc.). Depending on the size and location of the resulting properties, water service is provided by individual wells on each lot, a private water utility serving the entire subdivision or municipal water service to the subdivision. Subdivisions within the study area utilize a mix of all of these methods.

TRWD Settlement Agreement - An agreement with established commitments and funding for the Richland-Chambers reservoir and pipe project. This agreement effectively made the

Cities of Fort Worth, Arlington, Mansfield and the western division of the Trinity River Authority partners with TRWD in providing "East Texas" water to customers. This agreement also established certain responsibilities for TRWD and the four "Initial Contracting Parties", as well as defining "the system". (See Appendix C.)

Water Supply Corporation (WSC) and Investor Owned Utility (IOU) - These are non-municipal holders of CCN's who serve water to retail customers. WSC's are private, non-profit corporations and IOU's are private for-profit entities. Most of these in the study area have been set up to serve either a single subdivision or a group of subdivisions.

Weatherford Contract - A subsequent contract with TRWD (and its Initial Contracting Parties) to allow the City of Weatherford and BWSA to purchase raw water from TRWD from Lake Benbrook, a USACE lake.

INTRODUCTION

REASON FOR THE STUDY

The southeastern portion of Parker County, Texas, is currently undergoing rapid development and growth due to the area's proximity to the expanding Dallas-Fort Worth metroplex. The City of Fort Worth, immediately east of the study area, currently has a rapidly expanding economy due to thriving aeronautics, electronic and service industries and a generally strong Texas economy. Much of this growth is spilling over into Parker County which is perceived to have a more rural atmosphere in which to live. The expansion of residential subdivisions is also starting to attract feeder industries into eastern Parker County. In addition, the study area is bounded on the west by the City of Weatherford. Weatherford, a city of approximately 20,000 population is also experiencing rapid growth and an infusion of new industry. This expansion on either side of the study area virtually assures a continuation of population growth into southeastern Parker County and a densification of the rural area into an urban one.

Rapid growth has caused immediate pressures on the cities and towns within the study area. Of primary concern is the ability to obtain and distribute quality water to residences and businesses. Sewer service and transportation infrastructure are both priority issues, but fall behind the need for an adequate, quality water system. All water in the study area is currently produced by either public or private wells and receives little (chlorination only) or no treatment. Storage is mostly by ground or pneumatic tanks with only an occasional small elevated structure. Distribution lines are generally small, since even most public systems are conglomerations of small, previously private systems. Some of the entities in the study area have already experienced pressure reductions and water rationing during periods of high demand. As development continues, these shortages will become more frequent and apparent. Proper planning and construction to serve the increased demand is needed.

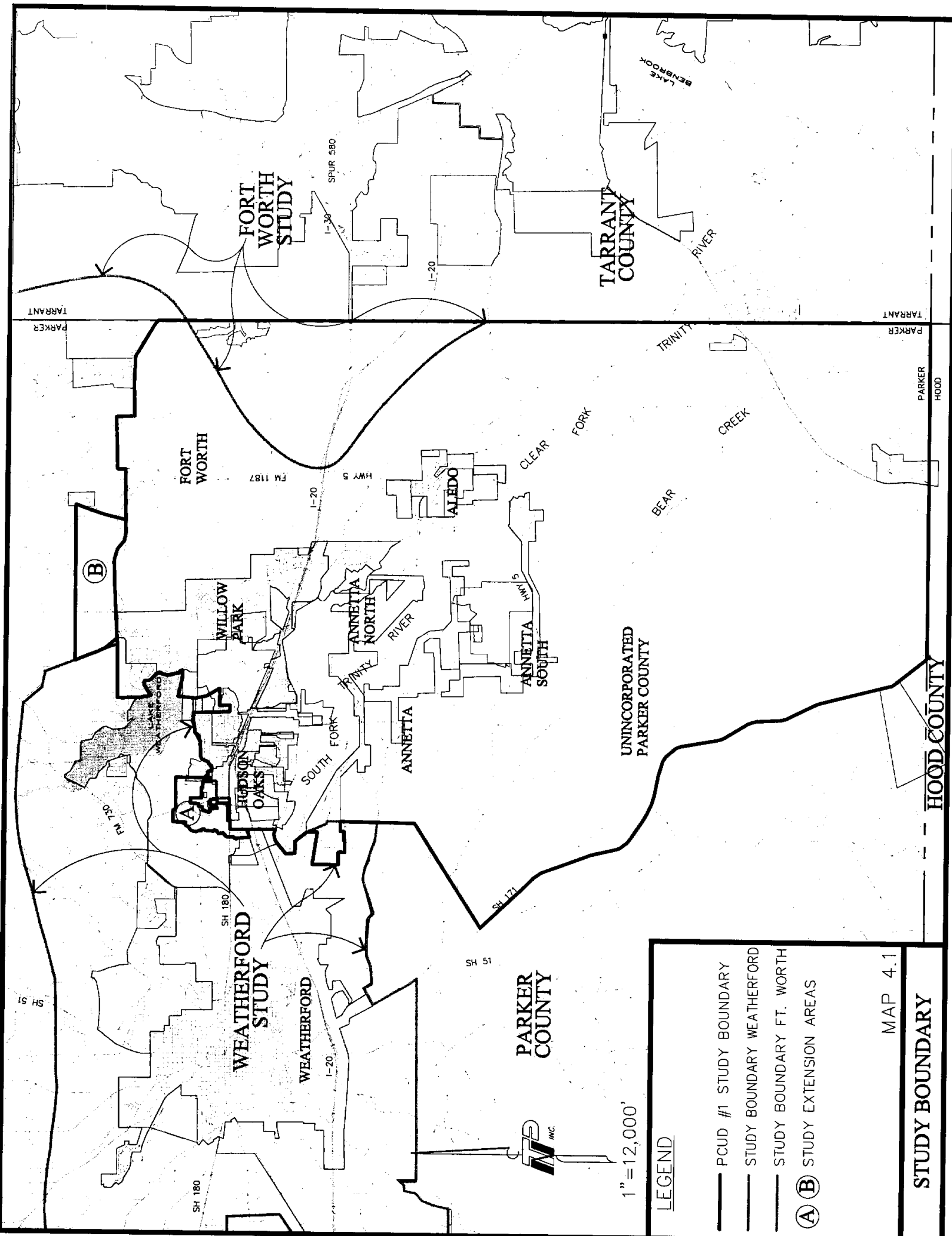
LOCATION OF STUDY AREA

The area included in this study is generally the southeastern quadrant of Parker County, Texas. The study area is bounded on the east and south by the Parker County line, on the southwest and west by F.M. 171, on the northwest by the City of Weatherford's recent water study boundary and on the north by White Settlement Road. (See Map 4.1 - Location of Study Area). The study area totals approximately 150 square miles and includes the cities and towns of Hudson Oaks, Willow Park, Aledo, Annetta North, Annetta South and Annetta. The remainder of the study area is within unincorporated Parker County. Interstate 20, a major Texas traffic artery, transverses the study area from Weatherford on the west to Fort Worth on the east.

OBJECTIVES OF THIS STUDY

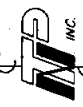
1. To determine the feasibility of a regional approach to water supply for the entire southeastern Parker County Study area using one main surface water source with one or more regional treatment facilities to provide better coverage at less cost than each entity supplying its own system.

2. The study has been viewed as a tool to bring all entities in the study area together to review joint approaches to individual and collective water supply problems.
3. Determine the appropriate legal entity to own and operate such a facility and lay the groundwork for creation of such an entity if one is not in existence.



1" = 12,000'

PARKER COUNTY

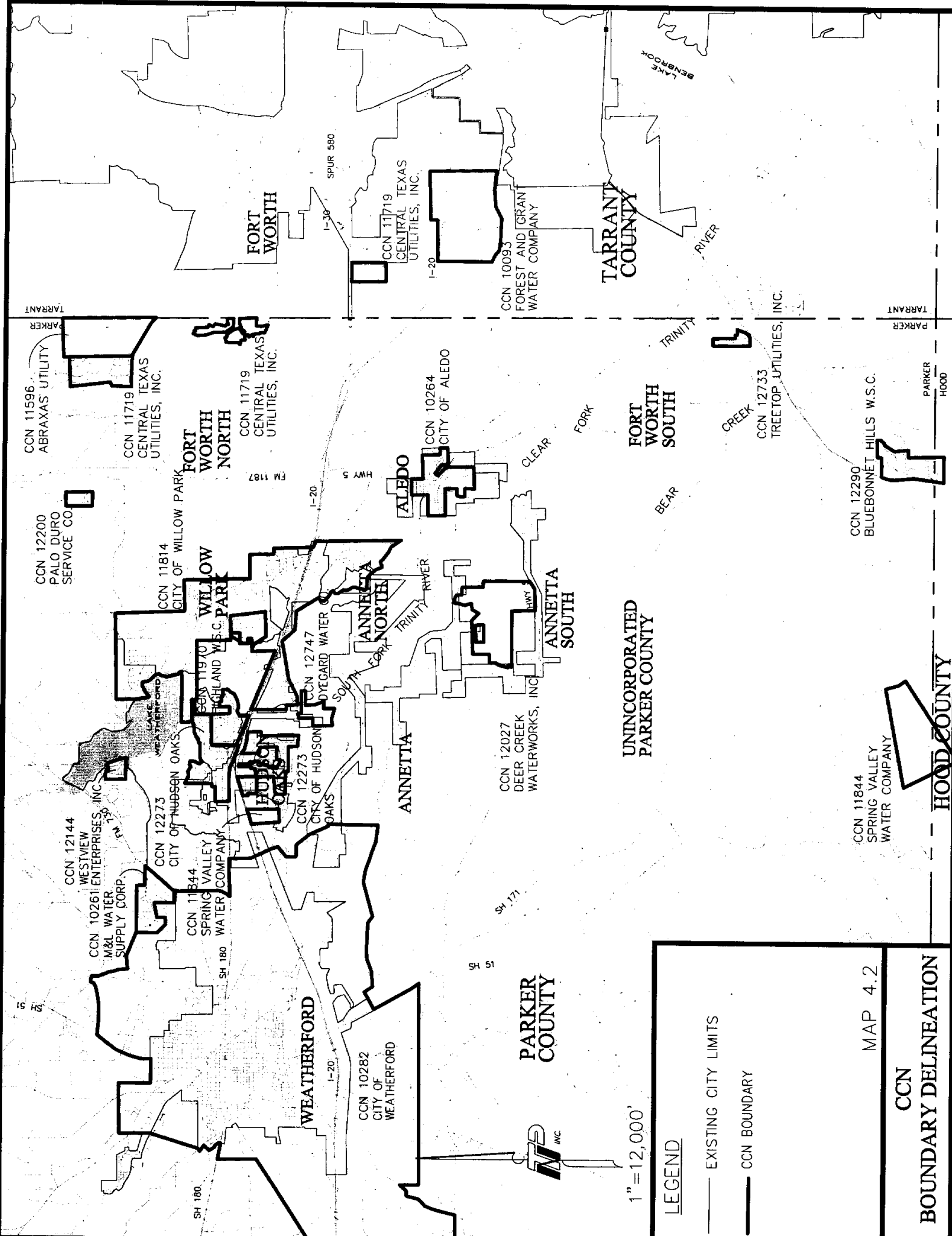


LEGEND

- PCUD #1 STUDY BOUNDARY
- STUDY BOUNDARY WEATHERFORD
- STUDY BOUNDARY FT. WORTH
- Ⓐ Ⓑ STUDY EXTENSION AREAS

MAP 4.1

STUDY BOUNDARY



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1" = 12,000'

LEGEND

- EXISTING CITY LIMITS
- CCN BOUNDARY

MAP 4.2

CCN

BOUNDARY DELINEATION

STUDY PARTICIPANTS

STUDY PARTICIPANT ENTITIES

The following entities participated in this study:

Primary Participants:

- Texas Water Development Board (TWDB)
- City of Willow Park
- City of Aledo
- City of Hudson Oaks
- Parker County
- Parker County Utility District No. 1 (PCUD#1)

Other Active Participants

- City of Weatherford
- City of Fort Worth
- Tarrant Regional Water District
- Teague Nail & Perkins, Inc.
- Various Concerned Citizens
- Town of Annetta
- Town of Annetta South
- Town of Annetta North
- Texas Natural Resources Conservation Commission (TNRCC)
- North Central Texas Council of Governments (NCTCOG)

Also Invited to Participate:

- Bluebonnet Hills WSC (CCN 12290)
- Treetop Utilities, Inc. (CCN 12733)
- Deer Creek Waterworks, Inc. (CCN 12027)
- Spring Valley Water Company (CCN 11844)
- Dyegard Water Company (CCN 12747)
- Highland Water Supply Corp. (CCN 11970)
- Central Texas Utilities (CCN 11719)
- Abraxas Utility (CCN 11596)
- Severn Trent (ST) Environmental

BACKGROUND

ECONOMIC DEVELOPMENT STRATEGIC PLAN FOR PARKER COUNTY

The need for this study was first conceived as a result of meetings of the Parker County Economic Development Committee. This group, working with the University of Texas at Arlington (UTA), Center for Economic Development Research and Service (CEDRAS) conducted a number of meetings and performed independent research into the economic needs of Parker County. This work culminated in a planning document entitled "Economic Development Strategic Plan for Parker County (CED96-7)" published in January 1997 by the Institute of Urban Studies at UTA. The principal authors were James Kunde and David Tees.

One of the charges of the research was to recognize needed improvements to promote strong economic growth throughout Parker County. The need to upgrade infrastructure, including roads, water and wastewater facilities, was identified as a primary element to attract new growth. The members of the Committee representing southeastern Parker County recognized the already significant increase in development in that quadrant of the County and subsequently identified adequate water supply and distribution as the most needed area of improvement. The following strategies related to water were noted in the report:

Water Strategy No. 1: Investigate water supply options.

1. Schedule a meeting with the Tarrant County Water Control and Improvement District #1 (now Tarrant Regional Water District) to inform district officials of the Parker County effort to establish a plan for alternate water supplies.
2. Contact the City of Weatherford to get a copy of their water development plan and check the status of their pipeline project.
3. Contact the Brazos River Authority to let them know about the Parker County plan to establish a regional water district.
4. Contact the Trinity River Authority to get the most recent information on surface water supplies.
5. Maintain a presence in Austin relative to these issues.

Water Strategy No. 2: Assess the potential for county-wide water conservation practices.

1. Contact the Texas Water Development Board to discuss water conservation and available funding for future projects.

Water Strategy No. 3. Develop an inventory of existing Parker County water supplies.

To date, actions have been initiated on all of these objectives. Some of these actions will be discussed herein.

ACTIONS BY OTHERS OUTSIDE THE STUDY AREA

During the same time frame as the above research, other groups were initiating their own responses to water and wastewater problems. These include the passage of Senate Bill 1 in the 1997 session of the State legislature to provide for statewide drought response planning and

mitigation. Locally, Parker County Utility District #1 (a Special Law District) in northern Parker County was created by the 1997 legislature primarily to deal with wastewater and, potentially, water issues.

One of the action items noted by the economic development committee was to contact the Brazos River Authority. The western portion of Parker County (west of the study area) drains into the Brazos River. This could affect future water planning in the western portion of the county. However, the Brazos has a high saline content and is not readily, or economically, treated. Incidentally, Senate Bill 1 legislation has since caused the creation of planning regions for the entire state with all of Parker County being in the upper Trinity planning region, "Area C". This would appear to effectively place the whole County in the surface water jurisdiction of the Tarrant Regional Water District, despite the western portion of the county's topographic relationship to the Brazos River.

Also, the Parker County Utility District #1 (PCUD#1), was created to provide wholesale wastewater service to northeastern Parker County. The enabling legislation for the District provides for growth of the district boundaries and expansion of service to include the wholesale of water, should such actions be deemed appropriate.

ACTIONS BY ENTITIES INSIDE THE STUDY AREA

After the economic development study, the cities and towns of Hudson Oaks, Aledo and Willow Park (all located in southeastern Parker County) and the County Commissioner for Precinct 4 (southeastern Parker County) began to explore joint and regional alternatives for water supply and distribution. In the fall of 1997, the three cities contacted Parker County and held a public meeting to explore the possibility of a regional study. At the public meeting it was decided that Hudson Oaks, Aledo, Willow Park and Parker County would jointly contract with the newly formed Parker County Utility District No. 1 (PCUD#1) to pursue assistance from the Texas Water Development Board (TWDB) to obtain funds to study the future water supply and distribution options for the area. PCUD#1 would act as the umbrella agency to serve as the liaison to the TWDB, representing the interests of the area. Funding on behalf of PCUD#1 was to be provided by Willow Park, Aledo, Hudson Oaks and Parker County.

In October of 1997, the consulting firm of Teague Nall and Perkins was retained by PCUD#1 to make application to the TWDB to conduct the study, hold public meetings, and prepare alternative solutions to the issue of future water supply and distribution. On February 19, 1998 the TWDB and PCUD#1 executed an agreement to participate with 50% cost sharing in the study, signifying the official beginning of the study. In March 1998, an informational questionnaire was submitted to water-serving entities within the study boundary. Entities included cities, towns and holders of Certificates of Convenience and Necessity (CCN). On April 29, 1998 a public meeting was held at the Hudson Oaks City Hall to notify any and all interested parties of the ongoing study and to solicit public input related to the topic. The results of these efforts are documented herein. (See Appendices A and F.)

On August 4, 1998, a second meeting was held at the Willow Park City Hall to brief participants and the public on the study progress. The intent of the meeting was to present several alternatives and discuss preliminary results obtained during the first half of the study. However, the summer of 1998 was extremely hot and dry in the study area and most of the local well systems were experiencing distress. As such, the participant cities and some of the private well systems had

started rationing efforts in late June and early July. Daily high temperatures during most of the summer exceeded 100 degrees Fahrenheit. Drought, fire protection and adequate water became primary public concerns. For these reasons, the meeting was well attended by the public and tended to concentrate on the reliability of well supplies. (Ironically, it finally rained on the day of the meeting.) Alternatives and preliminary results were presented without a significant amount of feedback from the public.

Subsequently, representatives from a number of the study cities met with the Board of PCUD#1 to try to derive a consensus opinion on the material presented at the meeting. Although, a unanimous consensus was not reached, it appeared that at least two of the three primary study cities showed an interest in continuing to work with PCUD #1 and potentially incorporating into the District boundaries.

A final meeting was held on January 4, 1999, at the Aledo City Hall to discuss the findings presented in this report. Following this meeting, the primary cities in the study area appointed a joint committee to further investigate regionalization options.

PRIOR STUDIES

Recent studies by several other entities played an important role in shaping this Southeastern Parker County Water Study.

UNIVERSITY OF TEXAS AT ARLINGTON

The "Economic Development Strategic Plan for Parker County (CED96-7)", January 1997, published by the Center for Economic Development Research and Service, Institute of Urban Studies, UTA has already been discussed. This research effort was a forerunner to the current study.

TEXAS DEPARTMENT OF WATER RESOURCES

Of primary benefit to this study was a report published by the Texas Department of Water Resources. This report entitled "Report 269 - Occurrence, Availability, and Chemical Quality of Ground Water in the Cretaceous Aquifers of North-Central Texas", Volumes 1 and 2, dated April 1982 gives some groundwater parameters for Parker County. In general, the report notes that the primary groundwater source for eastern Parker County is the Paluxy formation with an average well yield of 45 gpm (v.1,p.41). It also notes that mining of the Paluxy water began around 1900 and that heavy pumping in the Tarrant and Dallas County vicinities (immediately east of the study area) has created a large cone of depression in the aquifer in those locations (v1,p42). In addition, hardness and iron concentrations increase near the aquifer outcrop (v1,p42), which occurs locally just west of Weatherford. Paluxy water is generally fresh to slightly saline (v1,p14).

In recent years, a number of wells have been drilled to the Glen Rose and Twin Mountain Formations, which are parts of the lower Trinity Group. Although deeper and generally showing higher yields, these Trinity formations have some of the same problems associated with the Paluxy. These include a large cone of depression near Tarrant County and a westward trending increase in hardness, iron and salinity going toward the outcrop. Locally, these formations outcrop in western Parker County.

TEXAS WATER DEVELOPMENT BOARD

Several reports from the Texas Water Development Board (formerly the Texas Department of Water Resources) were used as references in this study. Foremost was "Water For Texas Today and Tomorrow", the 1996 consensus based update of the State Water Plan. This report estimates that, in general, the Texas population will double during the next 50 years, with urban water needs increasing as agricultural needs taper off. Also, it is projected that the use of surface water will continue to outpace the use of groundwater. Most of the major water supply and conveyance system projects are predicted to be surface water projects for the large urban areas, including the Fort Worth Area. Water conservation and drought response will continue to increase in priority. Interbasin transfers and regional water management plans will become more prominent. New lakes will need to be constructed and rules modified to encourage consolidation of water systems.

TARRANT REGIONAL WATER DISTRICT

In June 1998, Tarrant Regional Water District released a report prepared by HDR Engineering, Inc., entitled "Water Conservation and Emergency Demand Management Plan". This report gives water use projections for entities being served raw water by TRWD through the year 2050. It also includes water conservation guidelines. Incidentally, the proposed coverage does not include the southeastern Parker County area, however, it does include Weatherford.

CITY OF FORT WORTH

The City of Fort Worth "Water and Wastewater System Master Plan - Phase I, Strategic Plan", prepared in May 1987 by CDM for the Fort Worth Water Department and the "Water and Wastewater System Master Plan, Water System Plan", prepared in October 1989 by CDM for the Fort Worth Water Department were as used as references. These reports are updates to Fort Worth's Master Water Plan and make projections through the year 2010.

The 1987 report notes that water service should reach the Parker County line, in the vicinity of Interstate 20 by the year 1995 and continue along I-20 to reach FM 5 (Farmer Road) by 2010. Also, Fort Worth plans to have water service to portions of Parker County along Hwy 377 by the year 2010. The Fort Worth study area therefore includes a section of the northeastern portion of this southeastern Parker County study area. However, other areas of Parker County are not slated for service. Also of note is the fact that Fort Worth purchases its raw water from Tarrant Regional Water District and much of the report covers the water supplies of the District.

The 1989 report is much larger and deals primarily with the modeling of the Fort Worth water system. It generally covers projections to the year 2010 but also includes some projected demands to 2030. This study includes a small area in Parker County north of I-20 along Mary's Creek.

Recent discussions with the City of Fort Worth Water Department administration indicate that the City of Fort Worth views southeastern Parker County as part of Weatherford's potential service area. Fort Worth does not feel that it has the resources, nor is it willing, to serve the study area within the foreseeable future. However, an updated map supplied by the City shows its projected service area extending west to Highway 5 (FM 1187) from Aledo northward.

The City suggests that it will be the responsibility of Parker County to provide future water service in the area of overlap between the Fort Worth study and the Southeast Parker County Study. The location of the overlap is shown on Figure 1, the Study Boundary map.

CITY OF WEATHERFORD

The Weatherford Water Distribution Master Plan for the City of Weatherford MUB, dated 1997 and produced by TNP, describes the City of Weatherford's water service area. The study area for the Weatherford study overlaps this current study in two areas. The first is a small area which now appears to be in the city limits of Annetta North, and the second area is within the ETJ for Hudson Oaks. Otherwise, the Weatherford study forms the northwestern boundary for the southeastern Parker County study.

The Weatherford Study performs a computer model of Weatherford's distribution system and recommends system improvements and adjustments until the year 2057, the projected year of

ultimate development. The study uses an annual population growth rate of 3.46% for the study period. It also notes that Lake Weatherford soon will not support the increasing Weatherford demand, indicating the need for completion of Weatherford's pipeline to Lake Benbrook. The finished main will allow an additional 17.5 mgd delivery of raw water to Weatherford. Initial communication with the City of Weatherford indicates that no immediate plans are being made for completion of the line but mechanisms are in place to accelerate the construction schedule, if needed, due to drought or other unforeseen conditions. However, as the drought of the Summer of 1998 continued, Weatherford indicated that some of their trigger conditions were starting to be met and that they were planning to try to complete the pipeline in 1999 or 2000. It has not yet been fully determined whether recent rains and the return of normal lake supplies will delay this new schedule.

SUMMARY OF RESULTS FROM PRIOR STUDIES

The following are the primary relevant points gleaned from the prior studies.

1. The population for the area is expected to continue increasing.
2. Although wells have served much of the area in the past, well production may not be stable in the future due to over mining of the aquifer.
3. Tarrant Regional Water District controls the surface water supply in the general location of the study area.
4. Several prior studies border, or lap into, the Southeast Parker County study area. However, none of the studies address water service to the area.
5. Weatherford is currently preparing to construct a raw water line across the study area from Lake Benbrook to Lake Weatherford.

STUDY METHODOLOGY

GENERAL STEPS FOR CONDUCTING THE STUDY

This study was conducted to determine options for providing adequate water to customers in the study area for the next 30 years, considering continued growth of the area. The following steps were performed for this study. Please note that steps 1 through 3 have been discussed in detail during the previous chapters.

1. Meet with interested parties to assess current problems and perceived needs.
2. Inventory existing sources of supply and distribution systems, as well as on-going improvement plans.
3. Review prior water studies in, and/or near, the study area.
4. Determine geographic and land use constraints.
5. Determine population trends and projections for the study area.
6. Determine practical entity growth boundaries for analysis of options.
- g. Determine component costs for various types of construction and facilities.
8. Analyze feasibility of continuing with well based supply systems.
9. Analyze feasibility of purchasing treated water from neighboring entities.
10. Analyze feasibility of purchasing raw water and treating it to serve study area.
11. Review whether above methods should be handled individually by each entity, by groups of entities, or by a regional effort serving all entities.
12. Determine costs and facility sizes associated with practical options.
13. Conduct public meetings at specific study milestones to update the public and to receive input.
14. Summarize findings and make recommendations.

GENERAL METHODOLOGY

Contact was made with the neighboring entities who would be capable of supplying surface water to southeastern Parker County. These entities include the City of Weatherford, the City of Fort Worth and the Tarrant Regional Water District. Communication with these entities was an important factor in the determination of three future water supply alternatives which were compared for feasibility. Alternative 1 is to remain on groundwater supply and drill enough wells to meet

projected growth through 2030. Alternative 2 is to purchase treated water from a neighboring City (Fort Worth or Weatherford) and construct a distribution system of sufficient magnitude to supply water to the developed areas. Alternative 3 is to purchase raw water out of Lake Benbrook from TRWD, construct a raw water main and a treatment facility, and distribute treated water to the area distribution systems. Each alternative was analyzed to determine needed sizes and volumes based on population projections. Projected figures for population were obtained from the participant entities, the North Central Texas Council of Governments (NCTCOG), and the Texas Water Development Board (TWDB). The three alternatives were presented and discussed in public meetings. As a result of the cost analyses, feasibility and public opinion, Alternative 3 (purchase and treat raw water) was chosen as the preferable method to provide water to the southeast Parker County study area.

POPULATION PROJECTION METHODOLOGY

In order to determine population projections, the present and past populations were required. Population data were gathered from a number of sources including the Bureau of Census, North Central Texas Council of Governments, Texas Water Development Board, previous studies and from the various cities in the study area. Where possible, TWDB numbers were approximated using a constant growth curve which could be readily interpolated electronically. A summary of this data, along with projections and graphs, is shown in Appendix I.

The population data from all sources was analyzed to get historical population information. Long term population projections for Fort Worth and Weatherford were also analyzed due to the ready availability of a long history and the fact that both of these cities are major influences on the region in question. All of the readily available data for each city was plotted to get a "feel" for the trends expected by various agencies and the cities themselves.

The North Central Texas Council of Governments publishes an annual population report in which it includes a compound growth equation for a given period of time. This equation is of the form:

$$\text{Population} = \text{Base Year Population} \times (1 + \text{Compound Growth Rate})^{(\text{Years since Base Year})}$$

The base year used by NCTCOG changes over time. However, a review of the data indicated that growth was slow in the early part of the 1990's and has been accelerating as the Texas economy has improved. The latest NCTCOG figures are based on 1995 being the base year. However, using this compound growth factor, the resulting projections seemed to grow too fast relative to historic data and projections from other agencies. Therefore, a growth factor was calculated based on NCTCOG populations in 1990 and 1998. This factor, effectively representing an average of slow and rapid growths, appeared to fit well with the general trends of the population curves for all entities. The factors used are shown in Chapter 11, Table 11.1.

Most of the historic population data was derived from the U.S. Census and reported by the various sources. For Willow Park, Aledo, Hudson Oaks and Parker County, curve factors for projections were generated from NCTCOG and TWDB projections for future growth (based on TWDB data for the low, high and most likely trends). For Annetta North, Annetta and Annetta South, base populations from the 1990 census were used along with the compound growth factor calculated for unincorporated Parker County. This was done since almost no data or other projections existed for these entities other than the historical census. For the unincorporated study areas, a proration was made to determine the initial density per square mile for the entire county and then applied to

the unincorporated study areas. For the City of Weatherford, projections were based on the published population data in their recent water study report. In general, populations were allowed to grow at the rates stated in Chapter 11 until all available area for each entity reached a maximum of 2.5 persons per acre.

ENTITY GROWTH METHODOLOGY

For this study, the following criteria was generally assumed to determine the approximate ultimate annexation limits and size for cities within the study area. Cities were assumed to expand at the maximum allowable 10% of area per year until these boundaries were reached.

1. Aledo is currently surrounded by Fort Worth's ETJ and a boundary limit has been established. It was assumed that Aledo will expand to this set limit.
2. It was assumed that Willow Park will try to expand into much of its overlap with Fort Worth and into eastern and northern areas in which overlaps do not exist. Also, Willow Park will expand westward into areas not already claimed by Weatherford or included in the Weatherford water study. Willow Park has an agreed boundary with Hudson Oaks and was assumed to split any remaining areas between its present boundary and that of Annetta North.
3. It was assumed that Hudson Oaks would expand northwest toward the Weatherford city limits, encroaching somewhat on the Weatherford study area in this location. This assumption is based on past negotiation efforts between the two cities. Hudson Oaks was assumed to expand to its agreed boundary with Willow Park on the east and to split any remaining areas between themselves and Annetta North.
4. It was assumed that Annetta North would be limited by Weatherford's existing ETJ to the west, would be allowed to expand in Fort Worth's ETJ to the Aledo ETJ boundary and would split any remaining areas with Hudson Oaks, Willow Park and Annetta.
5. It was assumed that Annetta would expand to the western study boundary, eastward to Aledo's ETJ boundary, and would split remaining areas with Annetta North and Annetta South.
6. It was assumed that Annetta South would expand to the western study boundary, eastward to Aledo's ETJ boundary, southward to its current ETJ and would split available land to the north with Annetta.
7. It was assumed that Weatherford would not expand eastward beyond its present water study boundary.
8. It was assumed that Fort Worth would eventually annex westward to Highway 5 within the time frame of this study. However, it was assumed that any such areas would be served by the City of Fort Worth system. A small amount of service to the Fort Worth ETJ area was allowed to account for growth of existing private utilities in this area.

9. It was assumed that any remaining areas to the west of Highway 5 or to the south of Aledo/Annetta South would remain unincorporated during the time frame of this study.

Additional information and a map are provided in Chapter 12.

ECONOMIC METHODOLOGY

To compare capital, operation/maintenance, finance, and miscellaneous costs of the various options, costs were determined based on 1999 dollars. These costs were then projected to the time of construction using a 4.5 % annual inflation rate. Any project financing was assumed to be based on a 20 year financing at a 6% annual interest rate and with the first payment to occur in the year of initial construction.

To determine a method for anticipating the inflated value of money, historic data from the Federal Consumer Price Index (CPI) and the Engineering News Record (ENR) were reviewed and compared. Each one of these curves utilizes its own base year for comparison. For the CPI, a base value of 100 is used for 1982. The ENR index utilizes a base of 100 in 1913. After review, it was decided to use the historic CPI data and associated annual factors for standardizing all costs to 1999 dollars. The cost factors used are published in Appendix H.

The annual operation and maintenance costs (O&M) for each plant scenario was projected based on the flow anticipated for each phase and equipment needed. Environmental costs were calculated indirectly (as a percentage markup) while calculating capital costs.

WATER USE METHODOLOGY AND REGULATIONS - TNRCC

Once population projections were established, these projections were converted to anticipated water demands using standard Texas Natural Resource Conservation Commission (TNRCC) criteria as provided in the Texas Administrative Code, Chapter 290 "Water Hygiene", Subchapter D "Rules and Regulations for Public Water Systems". These rules apply to any system with a potential to serve 15 residential connections (or 25 people) on an annual basis. Since the retail end of any system studied would be larger than 250 customers (connections), the rules for systems 250 and larger were used. This criteria is the state mandated minimums for safe, potable water.

It should be noted that all the current systems included in the study are already governed by the rules in Subchapter D, however many do not meet the 250 connections minimum. All of the cities and private utilities supplying water in the study area possess Certificates of Convenience and Necessity (CCNs) from the TNRCC to provide water in their service areas.

The following highlights from TAC.290.41 about water sources should be noted:

- 1.) Water sources shall have a safe yield capable of supplying the maximum daily demands of the distribution system during extended periods of peak usage or critical hydrologic conditions. Minimum capacities as specified in the subchapter should be used to calculate the maximum daily demands. 290.41.(b).

- 2.) Well sites must have the following general offset restriction radii.
 - 10' from water-tight sewer pipes
 - 50' from non water-tight sewer pipe, storm sewers, cemeteries, or livestock pastures
 - 150' from septic drain fields, evapotranspiration beds, or underground petroleum or chemical storage or transmission facilities.
 - 300' from sewage wet wells, sewage pump stations, or waste ditches.
 - 500' from sewage treatment plants, animal feed lots, solid waste disposal sites, or land applied sludge or effluents

A sanitary control easement is required for the area within 150' from a well.
 290.41.(c).(1).

The following highlights about minimum water system capacity requirements in section TAC.290.45 should be noted:

- 1.) Wells must have a total capacity of 0.6 gallons per minute per connection, assuming no interconnections with other systems which can augment the system.
 290.45.(b).(1).(D)
- 2.) Total storage capacity (ground plus elevated) must equal or exceed 200 gallons per connection.
- 3.) Distribution and service pumping must be at least 2.0 gallons per minute per connection with 1000 gpm minimum and must be capable of meeting peak hour demands with the largest pump out of service.
- 4.) Elevated, or equivalent, storage must equal, or exceed, 100 gallons per connection.
- 5.) Raw water pumpage must meet 0.6 gallons per minute per connection, with largest pump out of service.
- 6.) Treatment plant capacity must provide 0.6 gallons per minute per connection under normal rated design flow.
- 7.) System transfer pumpage must be 0.6 gallons per minute per connection with the largest pump out of service.

WATER USE METHODOLOGY AND REGULATIONS - FIRE PROTECTION

The State Board of Insurance, Key Rate Schedule also requires the following fire flows at 20 psi. minimal residual pressure.

Principal Mercantile and Industrial Areas	3,000 gpm
Light Mercantile Areas	1,500 gpm
Congested Residential Areas	750 gpm
Scattered Residential Areas	500 gpm

Presently, Texas is changing its methods of assessing Key Rates to the Insurance Services Office, Inc. (ISO) standard. It is anticipated that this could cause some variance in the above figures, but should not be significant.

At this time, the bulk of the study area which has available fire protection would be considered "Scattered Residential" with some "Light Mercantile" areas along I-20, U.S. 180, and S.H. 5.

This report assumes that the options studied will be wholesale options, except for possibly wells, and that improvement in existing infrastructure to support additional fire protection will need to be performed by the retail provider and beyond the scope of this study. Each city will need to upgrade lines and storage to their own desired level of fire protection.

FACILITY SIZING AND COSTS

To determine facility sizing for this report, the above TNRCC criteria and existing data from the study participants was used. The following is a list of parameters used for the study.

Demands:

1. Production facilities were sized based on the minimum 0.6 gpm per customer.
2. Entity land areas ceased expanding once the boundaries shown in Map 12.2 were reached. Until such time, each entity grew geographically at 10% per year.
3. Areas were assumed to be saturated at 2.5 people per acre. It is realized that much of the existing residential development in the study area utilizes one acre lots. It is anticipated that newer subdivisions (given future availability to sewage treatment) will have smaller lots. However, demands were calculated base on total land area and some of the land is unbuildable (i.e., floodplain, inaccessible terrain, highways, etc.). Therefore, for the next 30 years, lots averaging slightly over one acre should be a reasonable assumption. At present, this is confirmed by current demographic data. Once the maximum land area had been reached, population growth was stopped and population stabilized at 2.5 people per acre.
4. All areas were assumed to be residential. At present, the commercial uses are minimal compared to the residential areas and their water use per acre is generally less than residential use.
3. To be conservative, and to match much of the areas existing demographic, each customer was assumed to consist of 3 people.

Wells:

1. Data provided from current wells indicate an average maximum production rate of 43 gallons per minute.
2. Each well was assumed to have a sanitary control easement of approximately 2 acres (150' radius). Each well was assumed to potentially restrict 18 acres for some activities.

Treatment Plant and Piping:

1. The most likely treatment scenarios consist of pumping raw water from Lake Benbrook to the top of the ridge near Aledo. Since a wholesale operation is anticipated, all of the retail "gates" (taps, valves and meters) should be lower in elevation than the plant. Therefore, any storage at the plant could act as elevated storage for the wholesale system. Each city will need to build, or make available, a ground storage tank and booster pumping at their gate. These costs have not been included in this study.

2. Treated water storage is based on 200 gallons per retail customer. This may potentially be reduced since client cities will already have some storage capacity and the wholesale water will not necessarily be coincident with a customer entity's pressure planes.
3. Booster pumping is based on 2 gpm per retail customer with a 1000 gpm minimum.
4. Pipe sizes were estimated based on a flow rate of 5 fps.
5. A pipe network was established to determine consistent pipe lengths. The location and numbering of this pipe system is shown in Map 17.1.
6. Base unit costs were derived from a number of sources. The resulting costs were then increased to include engineering, surveying, financial, administrative, legal and contingency costs. Please note that these costs are rudimentary and are to be used only for comparison and "order of magnitude" purposes. Actual costs will depend on time of construction, final facility design, and other factors. (See Table 14.1)
7. Pipes are assumed to be generally less than 5 feet in depth.

Cash Flow:

1. An attempt was made to project cash flow scenarios to incorporate income, construction, raw water costs, costs of operation and maintenance and financing costs. These numbers are also only for comparison. Real numbers will vary depending on when entities actually receive service, the timing of construction and upgrades, actual population growth in the area, and other factors. The numbers shown are not a substitute for specific financing purposes. A financial consultant should be obtained for actual finance packaging.
2. The following constants and factors were used:
 - Inflation Rate = 4.50% per year
 - Interest Rate = 6.00% per year
 - Loan Period on Construction = 20 years
 - Cost Recovery Factor = 0.0872
 - Raw Water Purchase Cost = \$644.11 per million gallons
 - Operation and Maintenance Cost Factor = .080
3. Utilizing the above information, a total annual cost was generated based on various construction sizes and timings. Each annual cost includes the annualized cost of all financed capital construction (plants and piping system) as well as the anticipated annual operation and maintenance cost. These values were then divided by the service population for each year to yield a monthly cost per retail connection and a cost per person. All costs are shown in current dollars.

METHODOLOGY FOR PROVIDING PHYSICAL IMPROVEMENTS

In this report, initial use of new pipeline and treatment plant improvements is proposed to begin within the next 5 to 10 years. This date is based on the assumption that items recommended in this report would not begin to be addressed until 1999, that two to three years would be consumed in land acquisitions and agreements between entities and that two to three years would be needed for design, permitting and construction of new facilities. Other upgrades during the 30 year

planning window are included, as needed, based on population and demand. In general, plant construction is based on a 20 year life cycle and pipes are based on at least 30 years. However, to reduce initial costs and to prevent excessive temporary oversizing, treatment plants and pipes are often staged or upgraded before the end of their normal life cycle.

For Option 3, the use of wells should be discontinued as early as possible to increase demand (i.e. income) at the treatment plant. It is assumed that no additional wells will be added once treatment facilities go on-line, however it is anticipated that most of the participant cities will be required to add wells between present day and treatment plant operation. Existing wells may need to be available for emergency use and peak demands.

GEOGRAPHIC CONSIDERATIONS

STUDY AREA BOUNDARY

As already discussed, the study boundary encompasses the southeastern quadrant of Parker County, Texas. This area includes portions of the Clear Fork of the Trinity River Basin within Parker County and is located downstream of Lake Weatherford and upstream of Lake Benbrook. The study area generally includes all areas within a line bounded by the northern border of the City of Willow Park near Lake Weatherford, eastward along Willow Park's border and White Settlement Road to the eastern Parker County line, south to the southeastern corner of Parker County, west along the county line to State Highway 171, northerly along S.H. 171 to the southern limits of a study by the City of Weatherford, then eastward and northward generally along the Weatherford's water study boundary and along the western side of Annetta North and Hudson Oaks, then eastward along the northern boundary of Hudson Oaks and projecting to the western boundary of Willow Park, then northward along the western boundary of Willow Park to the point of beginning. The study area includes the cities and towns of Hudson Oaks, Willow Park, Aledo Annetta North, Annetta and Annetta South, as well as unincorporated areas within the study boundary. (See Map 9.1 - General Study Area.)

WATERSHED GEOLOGY AND TOPOGRAPHY

The southeastern Parker County watershed consists of a portion of the Clear Fork of the Trinity River and several streams which feed the Clear Fork. These streams traverse valleys with alluvial bottomlands flanked by ridges of limestone hills. The main stream, the Clear Fork of the Trinity River, begins near the northwest corner of Parker County and extends southeastward to Lake Weatherford near the northwest corner of the study area. The Clear Fork then continues southeastward through the study area to the eastern Parker County line then on to Lake Benbrook in Tarrant County. A branch of the Clear Fork (the South Fork of the Clear Fork of the West Fork of the Trinity River, also known as the South Fork, or Town Creek) begins northwest of Weatherford and flows southeast through Weatherford and on to its junction with the Clear Fork west of Aledo. The towns within the study area are along, or upstream of, the Clear Fork and South Fork. This area is popular for residential property due to its aesthetic qualities, scenic views and available land.

Bear Creek, in the southern portion of the study area, parallels the Clear Fork in Parker County. In Tarrant County, Bear Creek joins the Clear Fork at Lake Benbrook. Except for some areas along Highway 377, the Parker County land draining into Bear Creek is ranch land and generally undeveloped. There are currently no incorporated cities within the Parker County watershed which drains into Bear Creek. With the Clear Fork, South Fork and Bear Creek basins, the study area encompasses most of the watershed between Lake Weatherford and Lake Benbrook.

The U.S. Department of Agriculture's Soil Conservation Service Soil Survey of Parker County, Texas, indicates that southeastern Parker county comprises primarily the neutral to moderately alkaline loamy upland soils of the Aledo-Venus-Bolar association. This soil group is gently sloping to sloping and undulating terrain made up of very shallow to deep loamy soils over limestone or clay loam. In the Clear Fork and Bear Creek River Basins, the slightly acid to moderately alkaline loamy and clayey bottomland soils are in the Frio-Krum association. These soils are nearly level

to gently sloping, deep loamy or clayey soils over silty clay loam or clay. On the western edge of the study boundary a small amount of neutral to slightly acid loamy and sandy upland soils are found. These soils are in the Windthorst-Duffau-Weatherford association, with gently sloping to sloping, deep loamy or sandy soils over weakly cemented sandstone or clay.

The United States Geological Survey quadrangle maps for the study area indicate that elevations range from a high of 1232 feet mean sea level (MSL) at the headwaters of Bear Creek near the Boyles NGS triangulation station just to the east of State Highway 171 and along the ridge separating the Trinity and Brazos river basins to a low of approximately 700 feet MSL at the downstream flowline of the Clear Fork of the Trinity River where it intersects the eastern Parker County Line. However, the bulk of the population growth is occurring along the Clear Fork due to its accessibility to Interstate 20 linking Weatherford and Fort Worth. For the primary growth area, the upper elevation can be represented by the 1112 MSL elevation near the Tinsley NGS triangulation station at the north end of Willow Park.

Lake Weatherford, at the upstream end of the study area, is a water supply lake constructed by the City of Weatherford in 1957. It has a watershed of approximately 121 square miles and is currently the sole source water supply for the City of Weatherford. The firm yield of the lake has recently been estimated at 2 mgd and the City of Weatherford currently has plant capacity to draw 8 mgd from the lake. Although Weatherford generally uses much less than 8 mgd, the plant capacity was reported to have been reached on at least one occasion during the unusually hot summer of 1998. Weatherford has contracted with the TRWD to pump raw water from Lake Benbrook to the plant at Lake Weatherford in preparation for growth and drought conditions. At present, the intake station at Lake Benbrook and a small portion of the pipeline have been constructed. In addition to water supply, Lake Weatherford also serves for general recreation and for cooling water at a Brazos Electric generating station on its west bank.

Lake Benbrook, just east of the study area, is a USACE lake. The excess usable water in the lake has been contracted or assigned to the TRWD which sells the raw water to cities for treatment. TRWD's largest customer is the City of Fort Worth who treats the raw water then sells treated water to a number of other cities in Tarrant County. TRWD also operates Lake Bridgeport in Wise County, Eagle Mountain Lake in northwest Tarrant County and the Richland-Chambers reservoir near Corsicana. Other system lakes include Lake Worth, Lake Arlington and Cedar Creek Reservoir. Water from Richland-Chambers and Cedar Creek is pumped to the Fort Worth Holly Treatment Plant and to Lake Benbrook to maintain the lake's elevation. Therefore, Lake Benbrook is not only the closest location (excluding Lake Weatherford) for existing surface water to serve the study area, but it is also the lake of choice due to this replenishment characteristic.

It should be noted that only Aledo and a portion of Willow Park's commercial section have wastewater capabilities within the study area. Much of Willow Park and all of the remaining cities and unincorporated area (except Deer Creek Estates) are served by septic systems. In the late 1980's, Weatherford experienced problems with septic flow reaching Lake Weatherford, which is Weatherford's sole source of water. Weatherford has since incorporated problem areas upstream of the lake and installed wastewater lines back to Weatherford's wastewater treatment plant. However, problems continue to be documented in the Clear Fork downstream of the lake.

[Map 9.1 - General Study Area]

LAND USES

The incorporated cities and towns are developing predominantly as 0.5 acre to 5 acre residential subdivision lots (most are approximately 1 acre) with small amounts of light commercial interspersed throughout. Some heavy commercial development is evident along the Interstate 20 corridor and near downtown Aledo. Immediate development plans indicate that lots will continue to develop with a significant acreage, rather than developing the typical 1/4 to 1/3 acre lots seen in more urban development. However, some 1/2 acre lots are currently being developed near Weatherford and Aledo.

In the unincorporated portions of the county, agriculture is the predominant land use type. As development continues to spill over from Fort Worth and Weatherford, it is anticipated that the agricultural land use will be replaced with mostly residential development. Significant amounts of commercial and industrial use are not anticipated in this area during the study period, except for the immediate Interstate 20 corridor, and possibly, along Highway 377.

SUBSURFACE GEOLOGY

The subsurface geology is primarily determined from well drilling logs. Although there are areas of natural gas production in the study area, the subsurface information for this report was gathered from water well reports. In general, surface soils are underlain by cretaceous limestones and sandstones. The top layer is the Fredericksburg and Washita Group which is generally 0 to 200 feet deep. This is underlain by the Paluxy formation of the upper Trinity Group which is approximately 180 feet thick and outcropping near the west end of the study area. Below the Paluxy is the Glen Rose formation followed by the Twin Mountain formation, each part of the lower Trinity Group and each being approximately 170-200 feet thick. Water wells are usually successful in the Paluxy formation and in the Twin Mountain (Trinity) formations.

As previously mentioned, the Texas Department of Water Resources report entitled "Report 269 - Occurrence, Availability, and Chemical Quality of Ground Water in the Cretaceous Aquifers of North-Central Texas", Volumes 1 and 2, dated April 1982 gave some groundwater parameters for Parker County. As noted, the primary groundwater source for eastern Parker County is the Paluxy formation with an average well yield of 45 gpm. Mining of the Paluxy water began around 1900 with heavy pumping in the Tarrant and Dallas County vicinities (immediately east of the study area). This has created a large cone of depression in the aquifer in those locations. Hardness and iron concentrations increase near the aquifer outcrop, which occurs locally just to the western side of Weatherford. Paluxy water is generally fresh to slightly saline.

In recent years, a number of wells have been drilled to the Glen Rose and Twin Mountain Formations, which are parts of the lower Trinity Group. Although deeper and generally showing higher yields, these formations have some of the same problems associated with the Paluxy. These include a large cone of depression near Tarrant County on the east and an increase in hardness, iron and salinity trending toward the west. Locally, these formations outcrop in western Parker County.

ENVIRONMENTAL CONCERNS

The overproduction of wells is not the only water concern in the watershed. Only a very small portion of the study area is served by aerobic wastewater treatment systems. Most houses are

served by individual septic tanks, which given the predominately limestone subsurface, are susceptible to surface (as Weatherford has experienced in the past) and groundwater contamination problems from the effluent. Houses in newer subdivisions are usually equipped with evapotranspiration ponds or small aerobic systems when state soil testing requirements cannot be met. This was not true of many systems constructed before the mid 1980's.

Also, in some areas, the effluent does not come to the surface but, due to the limestone, is not filtered either. It migrates along limestone "cracks" and "seams" until it enters streams or wells. For this reason, sewer system needs are a close second to water needs. Septic systems also pose a threat to wells and affect the land area available for wells due to septic/well spacing requirements.

For this reason, Weatherford started annexing areas around Lake Weatherford in the late 1980's and began requiring houses upstream of the lake to connect to the City sewer system. Prior to that time, the City was experiencing water quality problems at the Lake. Their efforts appear to have improved the quality in the lake but have had little effect on areas downstream. As such, TNRCC reports prepared in 1997 indicate that stream segment 0831 of the Clear Fork River below Lake Weatherford (and above Lake Benbrook) suffered from quality problems. In April 1997, it was reported that the upper end of the segment did not support aquatic life due to low dissolved oxygen levels and that the bulk of the stream was not good for contact recreation because of elevated fecal coliform bacteria levels. High levels of fecal coliforms were again reported in the August 1997 advisory report.

In addition to water contamination issues, the Endangered Species Act may play a role in any construction efforts to treat and distribute water. Currently, three listed species may be found in Parker County. These are the golden-cheeked warbler, the black-capped vireo, and the bald eagle. Any significant construction activity must include a search for these species habitats as part of the permitting process.

SERVICE HISTORIES

RELEVANCE OF HISTORY

The issue of water in southeastern Parker County is becoming complex due to the number of entities which will potentially be involved. Therefore, it is hard to extrapolate each entity's future interests without a quick review of their pasts. This will provide a more complete framework for the decisions to be made and the social, political and physical constraints involved.

PARKER COUNTY

Parker County was established in 1855. It covers 902 square miles straddling the ridge separating the Trinity River and Brazos River basins. Located immediately west of Tarrant County (Fort Worth), it has enjoyed a long relationship as a bordering rural area to the growing Fort-Worth Dallas metroplex. Elevation for the county ranges from 700 to 1400 ft MSL and the general terrain is hilly. The county normally receives just over 32 inches of rain per year and experiences an average monthly temperature range of 34 to 96 degrees Fahrenheit. The county seat is Weatherford which has a population of approximately 20,000 people. The county is dotted with an estimated 20 other small towns and communities for a total county population of greater than 70,000 people.

Historically, the county has been considered agricultural, but is currently trending toward urbanized uses. Water for domestic uses has typically been supplied by wells drilled to Paluxy or lower Trinity formations. The Brazos River flows along the southwestern side of the county. The Clear Fork of the Trinity River flows through the eastern portion of the county. Lake Weatherford, owned and operated by the City of Weatherford, is on the Clear Fork. At present, sewer in the county is primarily via septic tanks.

WEATHERFORD

The City of Weatherford was founded in the mid 1800's. With the creation of Parker County, Weatherford was established as the county seat. Weatherford was a frontier outpost and maintained a central position at the intersection of both east-west and north-south roadways and railways. Prior to 1900, the City had already been operating water, power, and gas utilities. Originally, water was supplied by a large well at what is now Cherry Park. Later this was augmented by other wells. By the drought of the 1950's, Weatherford operated a number of water wells along with a treatment plant. The treatment plant utilized water from Sunshine Lake, an old railroad water refill lake for steam engines, located just northwest of town. During the drought of the 1950's, both the lake and well supplies became threatened, and Weatherford constructed Lake Weatherford northeast of town, which has since completely replaced wells and Sunshine Lake as municipal water sources. Until recently, a treatment plant near downtown treated the Lake Weatherford water for municipal use. In the last few years, Weatherford has annexed much of the area between the City and Lake Weatherford, and has constructed a new replacement treatment plant on the southwestern edge of the Lake. Part of this action has been in preparation for the future delivery of water from Lake Benbrook to this point. It should be noted that Weatherford's contract to purchase raw water from TRWD currently precludes them from wholesaling treated water to others. However, the contract does contain a provision which might be used to ease this restriction.

Weatherford is a Home Rule city. It has both a City Council and Municipal Utility Board. Technically, the Utility Board is subordinate to the Council. However, several of the positions on the Utility Board are held by City Council members such that only a few board decisions are not ratified by Council.

Weatherford is home to a fairly large public school district and a community college. In addition, Weatherford has several radio stations and a daily (except Saturday) newspaper, the Weatherford Democrat.

ALEDO

The City of Aledo was founded in 1882 as a railroad refueling point near the Clear Fork of the Trinity River. Prior to 1882, it was known as the community of Parker Station. Due to its position on the railroad, Aledo has always had a good mix of commercial and residential land use. The City has operated a number of water wells throughout the years, and their current municipal system is a mix of City developed wells and well systems installed by developers prior to land annexations. It is thought that some residential property owners may still have private wells.

As an older community, the Aledo area also has its own school district which services a majority of the study area. There is a weekly newspaper, the Community News, which serves the study area. The City of Aledo operates a small sewer treatment plant along with its water utilities. It is a General Law city and has collected property taxes for a number of years.

WILLOW PARK

The City of Willow Park was incorporated in 1964. This city extends from the east side of Lake Weatherford southward to the now defunct community of Chico. The south end of Willow Park borders the Bankhead Highway, one of the first coast to coast American paved roads. This highway has since been replaced by U.S. Highway 80 in the early 1940's and by Interstate 20 in the 1970's. Willow Park has primarily been a bedroom community to Fort Worth, and to Carswell Air Force Base (Fort Worth NAS/JRB) along with General Dynamics (Lockheed) in particular. General Dynamics/Lockheed has operated the Squaw Creek Recreation Center in the heart of Willow Park for its employees for several decades. Willow Park is home to one of Texas' few horse racing facilities, Squaw Creek Downs (formerly Trinity Meadows.)

Originally, Willow Park operated a portion of the old Chico water system and a separate water system just to the east of Lake Weatherford. Over time, the incorporation of several other private well systems and city wells were included to form a large system capable of supplying new subdivisions. A recent upgrade involves the connection of the main system, which is east of the Clear Fork, with the Willow Springs Oaks area, west of the Clear Fork.

Although Carswell and Lockheed are not as active as in times past, Willow Park has continued to grow rapidly due to its location on Interstate 20 and its proximity to Fort Worth. In addition, commercial growth continues along the Interstate highway. Recently, Willow Park has started serving a portion of this commercial Interstate corridor with sewer treatment. The remainder of the town remains on septic systems.

Willow Park is a General Law city with less than 5,000 population. It has only been within the last few years that Willow Park has started to collect property taxes.

HUDSON OAKS

The City of Hudson Oaks was incorporated in the late 1970's at the junction where Interstate 20 splits from U.S. Highway 180. This city incorporates portions of a number of older small communities including Oakwood and Pumpkin Center. Perceived as a "bedroom" community to both Weatherford and Fort Worth, Hudson Oaks actually has a strong commercial/industrial base. This is due to the City containing most of the county's new car dealerships, several fast food restaurants, and the only liquor package stores in the county. As such, the city does not have property tax and currently depends on enterprise fees and sales taxes.

Hudson Oaks is a General Law city. Nearly all of its water systems have been acquired from private systems and are in the process of being connected together. Hudson Oaks is presently planning for its first sewage collection facilities to serve the commercial portion of town. Like Willow Park, the commercial areas are nearly all along Interstate 20 or U.S. Highway 180 (old U.S. 80).

FORT WORTH

The City of Fort Worth is a large metropolitan city to the east of the study area. As such, it has established water, sewer and other infrastructure systems. Fort Worth is TRWD's largest customer. Fort Worth also treats water for a number of cities in Tarrant County. Since the mid 1920's, Fort Worth has purchased raw water from the TRWD.

In the early 1980's, Fort Worth had a strong focus on expanding to the west. This can be evidenced by the western freeway "loop" proposed in their thoroughfare master plan, much of which will be in eastern Parker County. This is also evidenced by Fort Worth's role in preventing Weatherford from wholesaling water which it purchased through TRWD.

After the economic recession of the late 1980's, much of the economic factors pushing westward expansion diminished. Of primary importance on this curtailment of westward growth was the closing of Carswell Air Force Base and the large workforce reductions and eventual sale of General Dynamics. Prior to these events, much of western Fort Worth's economy was related to the military and defense industries.

In the late 1980's, construction on Alliance Airport was started in the northern part of Fort Worth. This facility has attracted a number of large industrial facilities and related business and residential developments. Growth has accelerated rapidly near this area. At present, Fort Worth has indicated that their utility growth efforts must be concentrated in this northern region in order to keep pace with the new growth. This seems to be the situation for the foreseeable future. Therefore, even though the western side of Fort Worth is again experiencing rapid growth, Fort Worth has indicated that it is not in a position to serve western wholesale water customers outside of its ETJ. (See Chapter 16 and Appendix B.)

TARRANT REGIONAL WATER DISTRICT

The Tarrant Regional Water District (TRWD) was founded as Tarrant County Water Improvement District Number 1 by the Tarrant County Commissioner's Court in October 1924 to provide county wide floodway protection. In 1925, Texas legislation allowed the District to also control raw water supply. This led to the 1926 name change making the District the Tarrant County Water Control and Improvement District Number 1 (TCWCID #1). Since that time, the District has been

responsible for Fort Worth's raw water supply from Eagle Mountain Lake and Lake Bridgeport. By the early 1970's, TCWCID#1 had also contracted raw water to a number of other smaller towns, including Arlington and Mansfield. By the late 1970's, it had become evident that additional supplies of raw water would be needed to supply the growing western portion of the metroplex. After several years of planning and negotiating, the District finally reached agreement in 1982, with Fort Worth, Mansfield, Arlington, and the Tarrant County portion (western district) of the Trinity River Authority to construct lakes and pipelines from east Texas back to Tarrant County.

This agreement made these four entities (the "Initial Contracting Parties") responsible for funding the District's bond debt for the construction of Richland-Chambers reservoir and pipelines from this reservoir and Cedar Creek reservoir back to Tarrant County. The agreement also gave the District storage capabilities in Lake Worth, Lake Arlington, and (through the Corps of Engineers) Lake Benbrook.

In 1996, the District's name was officially changed to the Tarrant Regional Water District (TRWD), such change reflecting its nature as a growing regional entity with a scope beyond Tarrant County. At present, a 72 inch pipeline brings water from Cedar Creek Reservoir back to Tarrant County and a similar 90 inch pipeline transports water from Richland-Chambers. Lake Benbrook is utilized as a receiving and balancing reservoir for both of these pipelines. Water from these lines can also be directed to Lake Arlington.

Due to high cost of the new reservoirs and water transmission systems, a number of safeguards were built into the 1982 contract to protect the interests of the bond holders, TRWD and the Initial Contracting Parties. These included provisions for others who contract with TRWD for raw water to pay a competitive rate along with a premium to "buy into" other capital costs of the existing system. Also, TRWD is to supply raw water with "system" funds, presumably so as not to compete with the Initial Contracting Parties. A fairly narrow interpretation of TRWD's raw water "system" is also included. For these reasons, the current contract would indicate that any future buyer would have to purchase raw water, come to the existing "system" to get it, and pay for all such costs themselves. (See Appendix C.)

PARKER COUNTY UTILITY DISTRICT NUMBER 1

Parker County Utility District Number 1 was created by the Texas legislature in 1997. At present, its formal boundary covers a large portion of northeastern Parker County. It's primary concern is to own and operate a wholesale wastewater system in the Walnut Creek watershed of northeastern Parker County. However, future expansions could include service to large portions of Parker County for both wastewater and water. Due to its recent creation, PCUD#1 does not currently operate any utility services but is in negotiations with existing treatment plant operators near Eagle Mountain Lake to start its Walnut Creek sewer system.

DEER CREEK AND OTHER PRIVATE UTILITY SYSTEMS

Dear Creek is a private water and wastewater system serving the large Deer Creek Estates subdivision between Annetta and Annetta South. It has been supplying water for over 10 years and has recently added sewer treatment for the newer areas of the subdivision.

Highland Water Supply, Dyegard, Palo Pinto and Spring Valley operate small systems which are located on the edge of Hudson Oaks. Several other small systems exist near Fort Worth and along Highway 377.

POPULATION

POPULATION HISTORY

Since the mid 1800's, Parker County has been predominantly agricultural. Even today, about 16% of the county's total employment is agricultural. However, farming and ranching have now been eclipsed by manufacturing at 18%, government at 25% and wholesale/retail trade at 28%. While this is true of the county as a whole, it is not necessarily representative of the southeastern quadrant. Actual employment in this area is still estimated to be largely agricultural related, with a small amount of wholesale/retail trade and government and a very small amount of manufacturing. However, much of the residential population is employed outside of the study area.

The increase in population in this area is due predominantly to residential development, with most residents commuting outside the study area. Hudson Oaks, Aledo and Willow Park are established communities, offering a range of city services. The Annettas (Annetta North, Annetta and Annetta South) are more limited governments and are currently not providing water or sewer services to their constituents. In the past, the main population growth appears to have been attributed to urban sprawl and recreation. People move further out of the Dallas-Fort Worth metroplex to avoid crime and other urban problems. Large tracts of available land and the high quality of the school districts have also been significant enticements.

Since the land area in question is fixed, a method was needed to determine an allocation of area for each city at different times in the study. A decision was made to estimate each city's expansion at the legal rate of 10% per year up to an ultimate size based on its proximity to adjoining cities and their ETJ's. As explained previously, these limits are arbitrary but realistic given the constraints involved.

The sources and methodology for population estimates is given in Chapter 8, "Study Methodology". In-depth population tables and graphs are included in the Appendix I. A summary of the growth rates and population projections for each entity and the population percentage for each map area are described in the following pages.

Population growth rates were compared using existing projections from the following sources:

1. NCTCOG - Data obtained from the North Central Texas Council of Governments Summary of Regional Population Estimates
2. Census - Data obtained from the U.S. Bureau of Census for each decade year, and U.S. Census estimates for other years
3. Self Reported - Populations as reported by each entity about itself
4. TWDB - Population estimates as published by the Texas Water Development Board
 - Low = 0% Migration
 - Medium = 5% Migration Rate
 - High = 10% Migration Rate
 - Likely = TWDB Most Likely Projection
 - Growth = NCTCOG Projections based on their published growth rate

The populations can be automated using the following formula:

$$\text{Population} = \text{Base Year Population} \times (1 + \text{Compound Growth Rate})^{(\text{Years since Base Year})}$$

TABLE 11.1
Population Projections
(Capita)

1990 Census Population	2328	1169	711	265	672	423	612	267	1252	14804
Population Growth Rate/Yr.	3.40%	3.40%	7.31%	3.47%	3.47%	3.47%	1.15%	1.15%	2.80%	3.10%
Maximum Density/Acre	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Ultimate Population	26280	5173	10394	13536	11569	15081	42633	39162	75776	

Year	A	B	C	D	E	F	G	H	I	J	Total	
	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta Annetta	Annetta South	Fort Worth North	Fort Worth South	Non-City SE Parker	Total		
1998	3,042	1,527	1,250	348	883	556	671	293	1,562	10,131	18,899	29,030
1999	3,145	1,579	1,342	360	913	575	678	296	1,605	10,495	19,485	29,980
2000	3,252	1,633	1,440	373	945	595	686	299	1,650	10,874	20,089	30,963
2001	3,363	1,689	1,545	386	978	616	694	303	1,696	11,269	20,712	31,981
2002	3,477	1,746	1,658	399	1,012	637	702	306	1,744	11,681	21,354	33,035
2003	3,595	1,805	1,779	413	1,047	659	710	310	1,793	12,112	22,016	34,128
2004	3,718	1,867	1,909	427	1,083	682	718	313	1,843	12,561	22,699	35,259
2005	3,844	1,930	2,049	442	1,121	706	727	317	1,895	13,030	23,402	36,432
2006	3,975	1,996	2,198	457	1,160	730	735	321	1,948	13,519	24,128	37,647
2007	4,110	2,064	2,359	473	1,200	755	743	324	2,002	14,031	24,876	38,907
2008	4,250	2,134	2,532	490	1,242	782	752	328	2,058	14,566	25,647	40,213
2009	4,394	2,207	2,717	507	1,285	809	761	332	2,116	15,126	26,442	41,568
2010	4,544	2,282	2,915	524	1,329	837	769	336	2,175	15,711	27,262	42,972
2011	4,698	2,359	3,128	542	1,376	866	778	339	2,236	16,323	28,107	44,430
2012	4,858	2,439	3,357	561	1,423	896	787	343	2,299	16,963	28,978	45,942
2013	5,023	2,522	3,602	581	1,473	927	796	347	2,363	17,634	29,876	47,511
2014	5,194	2,608	3,866	601	1,524	959	805	351	2,429	18,337	30,803	49,139
2015	5,370	2,697	4,148	622	1,577	992	815	355	2,497	19,073	31,757	50,830
2016	5,553	2,788	4,452	643	1,631	1,027	824	359	2,567	19,845	32,742	52,587
2017	5,742	2,883	4,777	666	1,688	1,063	833	364	2,639	20,654	33,757	54,411
2018	5,937	2,981	5,126	689	1,747	1,099	843	368	2,713	21,502	34,803	56,306
2019	6,139	3,083	5,501	713	1,807	1,138	853	372	2,789	22,393	35,882	58,275
2020	6,347	3,187	5,903	737	1,870	1,177	862	376	2,867	23,328	36,995	60,322
2021	6,563	3,296	6,335	763	1,935	1,218	872	381	2,947	24,309	38,141	62,451
2022	6,786	3,408	6,798	789	2,002	1,260	882	385	3,030	25,340	39,324	64,664
2023	7,017	3,524	7,295	817	2,071	1,304	893	389	3,114	26,424	40,543	66,967
2024	7,256	3,643	7,828	845	2,143	1,349	903	394	3,202	27,563	41,800	69,362
2025	7,502	3,767	8,400	874	2,218	1,396	913	398	3,291	28,760	43,096	71,856
2026	7,758	3,895	9,014	905	2,295	1,444	924	403	3,383	30,021	44,432	74,452
2027	8,021	4,028	9,673	936	2,374	1,494	934	408	3,478	31,347	45,809	77,156
2028	8,294	4,165	10,380	969	2,457	1,546	945	412	3,576	32,743	47,229	79,972
2029	8,576	4,306	10,394	1,002	2,542	1,600	956	417	3,676	33,469	48,693	82,162
2030	8,868	4,453	10,394	1,037	2,630	1,655	967	422	3,779	34,204	50,203	84,406
2031	9,169	4,604	10,394	1,073	2,721	1,713	978	427	3,884	34,963	51,759	86,722
2032	9,481	4,761	10,394	1,110	2,816	1,772	989	432	3,993	35,747	53,363	89,111
2033	9,803	4,923	10,394	1,149	2,913	1,834	1,001	437	4,105	36,558	55,018	91,575
2034	10,136	5,090	10,394	1,189	3,014	1,897	1,012	442	4,220	37,394	56,723	94,117
2035	10,481	5,173	10,394	1,230	3,119	1,963	1,024	447	4,338	38,169	58,482	96,650
2036	10,837	5,173	10,394	1,273	3,227	2,031	1,036	452	4,460	38,883	60,294	99,177
2037	11,206	5,173	10,394	1,317	3,339	2,102	1,047	457	4,584	39,620	62,164	101,783
2038	11,587	5,173	10,394	1,363	3,455	2,175	1,060	462	4,713	40,381	64,091	104,471
2039	11,981	5,173	10,394	1,410	3,575	2,250	1,072	468	4,845	41,167	66,078	107,244
2040	12,388	5,173	10,394	1,459	3,699	2,328	1,084	473	4,980	41,979	68,126	110,105
2041	12,809	5,173	10,394	1,509	3,827	2,409	1,097	478	5,120	42,817	70,238	113,055
2042	13,245	5,173	10,394	1,562	3,960	2,493	1,109	484	5,263	43,683	72,415	116,098
2043	13,695	5,173	10,394	1,616	4,098	2,579	1,122	489	5,411	44,577	74,660	119,237
2044	14,161	5,173	10,394	1,672	4,240	2,669	1,135	495	5,562	45,500	76,975	122,475
2045	14,642	5,173	10,394	1,730	4,387	2,761	1,148	501	5,718	46,454	79,361	125,815
2046	15,140	5,173	10,394	1,790	4,539	2,857	1,161	507	5,878	47,439	81,821	129,260
2047	15,655	5,173	10,394	1,852	4,697	2,956	1,174	512	6,042	48,456	84,357	132,814
2048	16,187	5,173	10,394	1,916	4,860	3,059	1,188	518	6,212	49,507	86,972	136,479
2049	16,738	5,173	10,394	1,983	5,028	3,165	1,202	524	6,386	50,592	89,669	140,261
2050	17,307	5,173	10,394	2,052	5,203	3,275	1,215	530	6,564	51,713	92,448	144,161

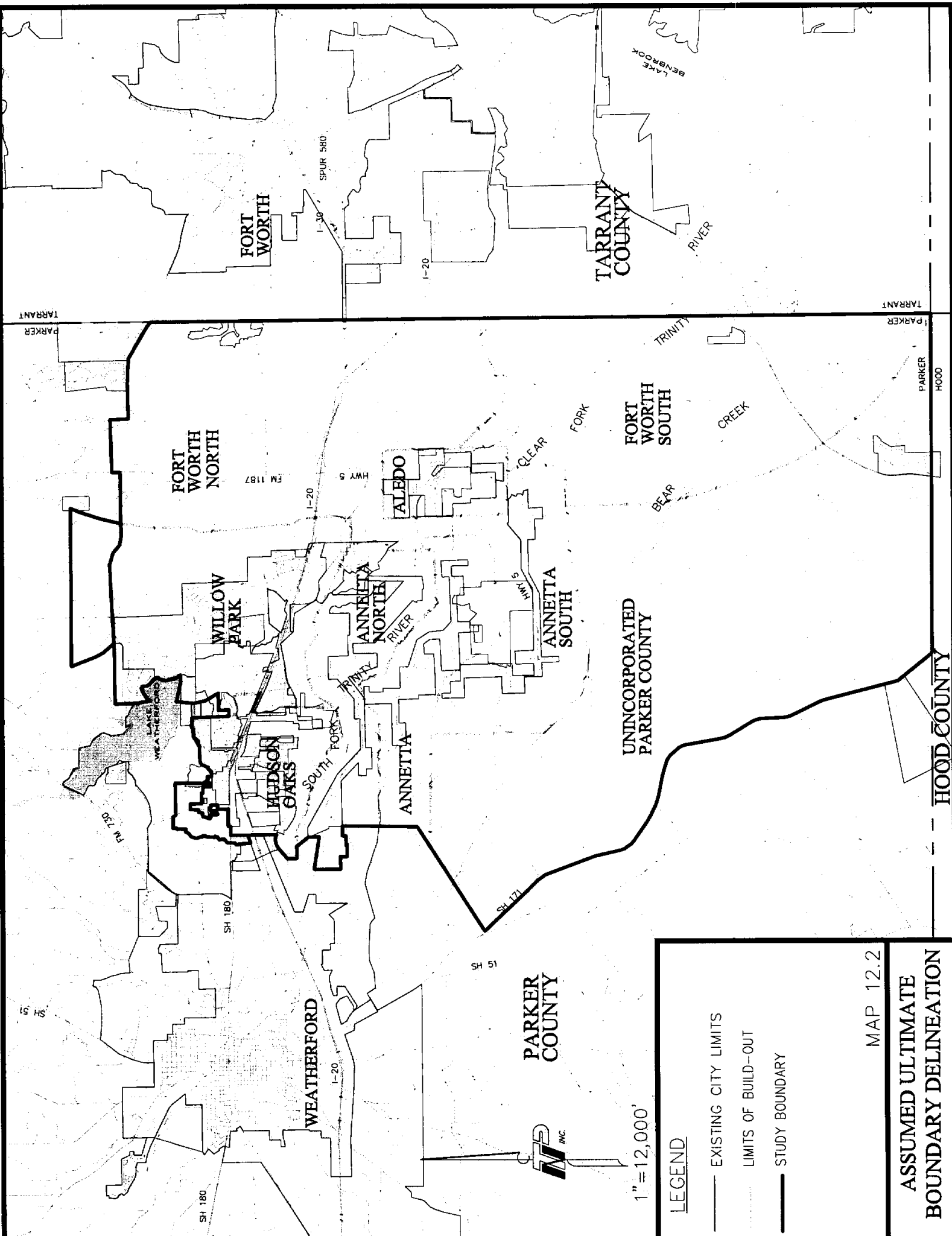
ENTITY BOUNDARIES AND GROWTH

SUBAREA PARAMETERS

To facilitate the study, the study area was delineated into subareas. Each area represents a portion of an entity, usually an ultimate city or an unincorporated area within the study area. For each subarea, a population percentage was calculated. These small areas were then grouped into service subareas for the treatment plant options studied and linked by trunk mains for primary distribution. Only main trunk lines feeding each city are included in the systems. Service was taken to a single valve and meter "gate" for each city. Distribution systems for each city/entity must be addressed by each entity as development occurs.

**TABLE 12.1
LAND AREA SUMMARIES**

Location	Existing Area			30 Year Maximum Area		
	SF	Acres	Sq. Mi.	SF	Acres	Sq. Mi.
Willow Park	154219801.26	3540.40	5.53	457899158.41	10511.92	16.42
Hudson Oaks	53750920.00	1233.95	1.93	181096354.07	4157.40	6.50
Aledo	54549401.36	1252.28	1.96	90139929.26	2069.33	3.23
Annetta North	87063235.29	1998.70	3.12	235842503.37	5414.20	8.46
Annetta	46446179.85	1066.26	1.67	201580340.43	4627.65	7.23
Annetta South	40552867.92	930.97	1.45	262776112.35	6032.51	9.43
Fort Worth North	0.00	0.00	0.00	742839371.02	17053.25	26.65
Fort Worth South	0.00	0.00	0.00	682353543.23	15664.68	24.48
Unincorporated	3650734327.27	83809.33	130.95	1320324271.44	30310.47	47.36
Willow Park Overrun	64181326.29	1473.40	2.30			
Hudson Oaks Overrun	23353524.33	536.12	0.84			
Total	4174851583.57	95841.40	149.75	4174851583.58	95841.40	149.75
Original Study Area	4087316732.95					
Total Overrun	87534850.62					
Total Studied Area	4174851583.57					



LEGEND

- EXISTING CITY LIMITS
- - - LIMITS OF BUILD-OUT
- STUDY BOUNDARY

MAP 12.2

**ASSUMED ULTIMATE
BOUNDARY DELINEATION**

1" = 12,000'

**PARKER
COUNTY**



HOOD COUNTY

UNINCORPORATED
PARKER COUNTY

FORT WORTH
SOUTH

FORT WORTH
NORTH

TARRANT
COUNTY

FORT WORTH

WATER SUPPLY AND USE CRITERIA

EXISTING USAGE AND WATER SUPPLY:

At the beginning of this study, a questionnaire was sent to entities within the study area to assess the current water status of each area. All of the entities surveyed are served by wells, predominantly from the Paluxy formation. However, most new water system wells are being drilled into the lower Trinity formations, where possible, due to a generally higher yield per well. A summary of the survey data is given in Appendix A.

In addition, the summer of 1998 proved to be very hot and dry. Even though the drought itself was very short (approximately 4-5 months), the severity was sufficient for most water providers in the area to enact water rationing. (See news articles in Appendix G) This event highlighted three major points relevant to the study.

- 1.) Well supplies are limited and vulnerable to droughts.
- 2.) The public needs education regarding the need for rationing. Also, most towns in the study area could benefit from a more comprehensive water conservation plan.
- 3.) Area growth (demand) is starting to surpass productions during peak times for the water utilities in the study area.

At one point during the summer, a citizens group from one of the entities (Hudson Oaks) demanded that the city provide virtually unlimited water to its customers. Even though the basic request is unreasonable (especially during drought), it does point out a very basic question which must be answered by any water study - "How much water is enough?". When trying to balance the water needs of the area with the affordability of systems, this question becomes paramount. Therefore, the following table was generated to see if the use of the TNRCC minimum criteria for the study would be adequate. In short, it was decided that anything in excess of the minimum from well sources would only further mine the aquifer. Also, any surface water system would require new facilities with high up-front costs. Since water systems are generally considered as "enterprise" operations for funding (i.e. system generates revenue with the intent of funding itself) the goal would be to minimize the up-front costs, deliver an adequate product and then upgrade the system based on demand, as needed. A review of the chart indicates that the TNRCC criteria would be adequate for most normal needs, especially during the first phase(s) of construction, since the utilities would still have use of their existing well systems.

**TABLE 13.2
CURRENT WATER SUPPLY**

SUPPLIES:	Total (mgd)	Total (gpm)	Population Supported At "x" gpm per Customer			1.20
			0.40	0.60	0.80	
Willow Park Wells - Running 24 hr/day	1.23	856	2,140	1,427	1,070	856
Willow Park Wells - Running 16 hr/day	0.81	565	1,412	942	706	565
Aledo Wells - Running 24 hr/day	0.44	307	768	512	384	307
Aledo Wells - Running 16 hr/day	0.29	203	507	338	253	203
Hudson Oaks Wells - Running 24 hr/day	1.13	786	1,965	1,310	983	786
Hudson Oaks Wells - Running 16 hr/day	0.75	519	1,297	865	648	519
Hudson Oaks Wells (HOCCC System Only - 24 hr/day)	0.48	332	830	553	415	332
Hudson Oaks Wells (HOCCC System Only - 16 hr/day)	0.32	219	548	365	274	219
Deer Creek Estates (Annettas) Wells - Running 24 hr/day	0.56	390	975	650	488	390
Deer Creek Estates (Annettas) Wells - Running 16 hr/day	0.37	257	644	429	322	257
Lake Weatherford - Safe Firm Yield	2.00	1,389	3,472	2,315	1,736	1,389
Lake Weatherford - High Yield	12.00	8,333	20,833	13,889	10,417	8,333
Tarrant Regional Water District System - Safe Firm Yield	370.00	256,944	642,361	428,241	321,181	256,944
Tarrant Regional Water District System - High Yield	2,224.00	1,544,444	3,861,111	2,574,074	1,930,556	1,544,444
						1,287,037

TABLE 13.3

**AVERAGE DAILY DEMAND FOR RAW SURFACE WATER BY ENTITY
(REMAINDER OF SERVICE FROM WELL WATER UNTIL CUT-OFF DATE SPECIFIED)**

(mgd)

Year to Start Regional Service	2005	2005	2005	2015	2015	2015	2020	2020	2025	2000		
Year to Take Wells Off-line	2010	2010	2010	1998	1998	1998	1998	1998	1998	1998		
Dependable Well Production	1.05	0.35	1.06	0.00	0.24	0.24	0.25	0.11	0.95	0.00		
	A	B	C	D	E	F	G	H	I	J		
Year	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta	Annetta South	Fort Worth North	Fort Worth South	Non-City SE Parker	Total	W'ford	Total
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.09	3.09
2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18	3.18
2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.28	3.28
2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38	3.38
2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.49	3.49
2005	0.59	0.30	0.31	0.00	0.00	0.00	0.00	0.00	0.00	1.20	3.59	4.80
2006	0.61	0.31	0.34	0.00	0.00	0.00	0.00	0.00	0.00	1.25	3.71	4.96
2007	0.63	0.32	0.36	0.00	0.00	0.00	0.00	0.00	0.00	1.31	3.82	5.13
2008	0.65	0.33	0.39	0.00	0.00	0.00	0.00	0.00	0.00	1.37	3.94	5.31
2009	0.67	0.34	0.42	0.00	0.00	0.00	0.00	0.00	0.00	1.43	4.06	5.49
2010	0.70	0.35	0.45	0.00	0.00	0.00	0.00	0.00	0.00	1.50	4.19	5.68
2011	0.72	0.36	0.48	0.00	0.00	0.00	0.00	0.00	0.00	1.56	4.32	5.88
2012	0.75	0.37	0.52	0.00	0.00	0.00	0.00	0.00	0.00	1.64	4.45	6.09
2013	0.77	0.39	0.55	0.00	0.00	0.00	0.00	0.00	0.00	1.71	4.59	6.30
2014	0.80	0.40	0.59	0.00	0.00	0.00	0.00	0.00	0.00	1.79	4.73	6.52
2015	0.82	0.41	0.64	0.10	0.24	0.15	0.00	0.00	0.00	2.37	4.88	7.24
2016	0.85	0.43	0.68	0.10	0.25	0.16	0.00	0.00	0.00	2.47	5.03	7.50
2017	0.88	0.44	0.73	0.10	0.26	0.16	0.00	0.00	0.00	2.58	5.19	7.77
2018	0.91	0.46	0.79	0.11	0.27	0.17	0.00	0.00	0.00	2.70	5.35	8.05
2019	0.94	0.47	0.84	0.11	0.28	0.17	0.00	0.00	0.00	2.82	5.51	8.33
2020	0.97	0.49	0.91	0.11	0.29	0.18	0.13	0.06	0.00	3.14	5.68	8.83
2021	1.01	0.51	0.97	0.12	0.30	0.19	0.13	0.06	0.00	3.28	5.86	9.14
2022	1.04	0.52	1.04	0.12	0.31	0.19	0.14	0.06	0.00	3.43	6.04	9.47
2023	1.08	0.54	1.12	0.13	0.32	0.20	0.14	0.06	0.00	3.58	6.23	9.81
2024	1.11	0.56	1.20	0.13	0.33	0.21	0.14	0.06	0.00	3.74	6.42	10.16
2025	1.15	0.58	1.29	0.13	0.34	0.21	0.14	0.06	0.51	4.42	6.62	11.04
2026	1.19	0.60	1.38	0.14	0.35	0.22	0.14	0.06	0.52	4.61	6.82	11.44
2027	1.23	0.62	1.49	0.14	0.36	0.23	0.14	0.06	0.53	4.81	7.04	11.85
2028	1.27	0.64	1.59	0.15	0.38	0.24	0.15	0.06	0.55	5.03	7.25	12.28
2029	1.32	0.66	1.60	0.15	0.39	0.25	0.15	0.06	0.56	5.14	7.48	12.62
2030	1.36	0.68	1.60	0.16	0.40	0.25	0.15	0.06	0.58	5.25	7.71	12.96
2031	1.41	0.71	1.60	0.16	0.42	0.26	0.15	0.07	0.60	5.37	7.95	13.32
2032	1.46	0.73	1.60	0.17	0.43	0.27	0.15	0.07	0.61	5.49	8.20	13.69
2033	1.51	0.76	1.60	0.18	0.45	0.28	0.15	0.07	0.63	5.62	8.45	14.07
2034	1.56	0.78	1.60	0.18	0.46	0.29	0.16	0.07	0.65	5.74	8.71	14.46
2035	1.61	0.79	1.60	0.19	0.48	0.30	0.16	0.07	0.67	5.86	8.98	14.85
2036	1.66	0.79	1.60	0.20	0.50	0.31	0.16	0.07	0.68	5.97	9.26	15.23
2037	1.72	0.79	1.60	0.20	0.51	0.32	0.16	0.07	0.70	6.09	9.55	15.63
2038	1.78	0.79	1.60	0.21	0.53	0.33	0.16	0.07	0.72	6.20	9.84	16.05
2039	1.84	0.79	1.60	0.22	0.55	0.35	0.16	0.07	0.74	6.32	10.15	16.47
2040	1.90	0.79	1.60	0.22	0.57	0.36	0.17	0.07	0.76	6.45	10.46	16.91
2041	1.97	0.79	1.60	0.23	0.59	0.37	0.17	0.07	0.79	6.58	10.79	17.37
2042	2.03	0.79	1.60	0.24	0.61	0.38	0.17	0.07	0.81	6.71	11.12	17.83
2043	2.10	0.79	1.60	0.25	0.63	0.40	0.17	0.08	0.83	6.85	11.47	18.31
2044	2.18	0.79	1.60	0.26	0.65	0.41	0.17	0.08	0.85	6.99	11.82	18.81
2045	2.25	0.79	1.60	0.27	0.67	0.42	0.18	0.08	0.88	7.14	12.19	19.33
2046	2.33	0.79	1.60	0.27	0.70	0.44	0.18	0.08	0.90	7.29	12.57	19.85
2047	2.40	0.79	1.60	0.28	0.72	0.45	0.18	0.08	0.93	7.44	12.96	20.40
2048	2.49	0.79	1.60	0.29	0.75	0.47	0.18	0.08	0.95	7.60	13.36	20.96
2049	2.57	0.79	1.60	0.30	0.77	0.49	0.18	0.08	0.98	7.77	13.77	21.54
2050	2.66	0.79	1.60	0.32	0.80	0.50	0.19	0.08	1.01	7.94	14.20	22.14

TABLE 13.4

**DESIGN WATER DEMAND FROM NEW FACILITIES BY ENTITY
(REMAINDER OF SERVICE FROM WELL WATER UNTIL CUT-OFF DATE SPECIFIED)**

(mgd)

Year to Start Regional Service	2005	2005	2005	2015	2015	2015	2020	2020	2025	2000		
Year to Take Wells Off-line	2010	2010	2010	1998	1998	1998	1998	1998	1998	1998		
Dependable Well Production	1.05	0.35	0.55	0.00	0.24	0.24	0.25	0.11	0.95	0.00		
	A	B	C	D	E	F	G	H	I	J		
Year	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta	Annetta South	Fort Worth North	Fort Worth South	Non-City SE Parker	Total	W'ford	Total
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.79	5.79
2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97	5.97
2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.15	6.15
2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.34	6.34
2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.54	6.54
2005	0.06	0.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.30	6.74	7.04
2006	0.09	0.22	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.40	6.95	7.35
2007	0.13	0.24	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.51	7.16	7.67
2008	0.17	0.26	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.62	7.39	8.00
2009	0.22	0.29	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.73	7.62	8.35
2010	0.26	0.31	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.86	7.85	8.71
2011	1.35	0.68	0.90	0.00	0.00	0.00	0.00	0.00	0.00	2.93	8.09	11.03
2012	1.40	0.70	0.97	0.00	0.00	0.00	0.00	0.00	0.00	3.07	8.35	11.41
2013	1.45	0.73	1.04	0.00	0.00	0.00	0.00	0.00	0.00	3.21	8.60	11.81
2014	1.50	0.75	1.11	0.00	0.00	0.00	0.00	0.00	0.00	3.36	8.87	12.23
2015	1.55	0.78	1.19	0.18	0.45	0.29	0.00	0.00	0.00	4.44	9.15	13.58
2016	1.60	0.80	1.28	0.19	0.47	0.30	0.00	0.00	0.00	4.64	9.43	14.06
2017	1.65	0.83	1.38	0.19	0.49	0.31	0.00	0.00	0.00	4.84	9.72	14.57
2018	1.71	0.86	1.48	0.20	0.50	0.32	0.00	0.00	0.00	5.06	10.02	15.09
2019	1.77	0.89	1.58	0.21	0.52	0.33	0.00	0.00	0.00	5.29	10.33	15.63
2020	1.83	0.92	1.70	0.21	0.54	0.34	0.25	0.11	0.00	5.89	10.65	16.55
2021	1.89	0.95	1.82	0.22	0.56	0.35	0.25	0.11	0.00	6.15	10.98	17.14
2022	1.95	0.98	1.96	0.23	0.58	0.36	0.25	0.11	0.00	6.43	11.33	17.75
2023	2.02	1.01	2.10	0.24	0.60	0.38	0.26	0.11	0.00	6.71	11.68	18.39
2024	2.09	1.05	2.25	0.24	0.62	0.39	0.26	0.11	0.00	7.02	12.04	19.05
2025	2.16	1.08	2.42	0.25	0.64	0.40	0.26	0.11	0.95	8.28	12.41	20.69
2026	2.23	1.12	2.60	0.26	0.66	0.42	0.27	0.12	0.97	8.65	12.80	21.44
2027	2.31	1.16	2.79	0.27	0.68	0.43	0.27	0.12	1.00	9.03	13.19	22.22
2028	2.39	1.20	2.99	0.28	0.71	0.45	0.27	0.12	1.03	9.43	13.60	23.03
2029	2.47	1.24	2.99	0.29	0.73	0.46	0.28	0.12	1.06	9.64	14.02	23.66
2030	2.55	1.28	2.99	0.30	0.76	0.48	0.28	0.12	1.09	9.85	14.46	24.31
2031	2.64	1.33	2.99	0.31	0.78	0.49	0.28	0.12	1.12	10.07	14.91	24.98
2032	2.73	1.37	2.99	0.32	0.81	0.51	0.28	0.12	1.15	10.30	15.37	25.66
2033	2.82	1.42	2.99	0.33	0.84	0.53	0.29	0.13	1.18	10.53	15.85	26.37
2034	2.92	1.47	2.99	0.34	0.87	0.55	0.29	0.13	1.22	10.77	16.34	27.11
2035	3.02	1.49	2.99	0.35	0.90	0.57	0.29	0.13	1.25	10.99	16.84	27.84
2036	3.12	1.49	2.99	0.37	0.93	0.59	0.30	0.13	1.28	11.20	17.36	28.56
2037	3.23	1.49	2.99	0.38	0.96	0.61	0.30	0.13	1.32	11.41	17.90	29.31
2038	3.34	1.49	2.99	0.39	1.00	0.63	0.31	0.13	1.36	11.63	18.46	30.09
2039	3.45	1.49	2.99	0.41	1.03	0.65	0.31	0.13	1.40	11.86	19.03	30.89
2040	3.57	1.49	2.99	0.42	1.07	0.67	0.31	0.14	1.43	12.09	19.62	31.71
2041	3.69	1.49	2.99	0.43	1.10	0.69	0.32	0.14	1.47	12.33	20.23	32.56
2042	3.81	1.49	2.99	0.45	1.14	0.72	0.32	0.14	1.52	12.58	20.86	33.44
2043	3.94	1.49	2.99	0.47	1.18	0.74	0.32	0.14	1.56	12.84	21.50	34.34
2044	4.08	1.49	2.99	0.48	1.22	0.77	0.33	0.14	1.60	13.10	22.17	35.27
2045	4.22	1.49	2.99	0.50	1.26	0.80	0.33	0.14	1.65	13.38	22.86	36.23
2046	4.36	1.49	2.99	0.52	1.31	0.82	0.33	0.15	1.69	13.66	23.56	37.23
2047	4.51	1.49	2.99	0.53	1.35	0.85	0.34	0.15	1.74	13.96	24.29	38.25
2048	4.66	1.49	2.99	0.55	1.40	0.88	0.34	0.15	1.79	14.26	25.05	39.31
2049	4.82	1.49	2.99	0.57	1.45	0.91	0.35	0.15	1.84	14.57	25.82	40.40
2050	4.98	1.49	2.99	0.59	1.50	0.94	0.35	0.15	1.89	14.89	26.63	41.52

ECONOMIC CONSIDERATIONS

ESTABLISHING CURRENT (1998) COMPONENT COSTS

As discussed in the methodology section (Chapter 8), unit costs were obtained from a number of sources to generate the tables in Appendix H. Plant construction costs were determined from several sources. Weight was given to recent costs for Weatherford plant improvements given that Weatherford's plant is a new facility, in roughly the same geographic location and of approximately the same size as the anticipated plant needed to serve the study area for much of the next 30 years. Pipe costs are based on recent projects. Pumping costs are based on adjusted figures from the Fort Worth study performed by CDM. All costs are for comparison only. Actual costs cannot be effectively estimated until the final design stage.

INFLATIONAL COST ESCALATIONS

Historic and projected costs must be adjusted for inflation. To bring past costs "up-to-date" and to project future costs, several indices were used as noted in Chapter 8. A summary of these indices can be found in Appendix H.

STUDY OPTION 1 - WELLS

The first option considered was to continue reliance on ground water. This option assumes that additional wells will be added, as needed, to meet growing demands. No surface water supplies will be considered during this study period (through 2030).

It appears that the continued use of wells will hamper area growth, due to groundwater availability, water quality and the land area needed for wells. In contrast, the neighboring urban areas of Fort Worth and Weatherford depend on surface water, each abandoning the dependency on wells long ago. Both are currently evaluating ways to ensure their own surface supplies in the event of continued growth and/or drought. As mentioned earlier, except for Weatherford's current surface reservoir (Lake Weatherford), all nearby surface reserves in the Trinity Basin are controlled by Tarrant Regional Water District (TRWD). Fort Worth currently acquires raw water from TRWD and Weatherford has a contract for raw water from TRWD but is not currently utilizing these available resources.

The results of the questionnaire sent to the study participants provided a basis for the number of needed wells to serve the area through 2030, the end of the study period. Based on calculations described below, land restraints make it physically restrictive to continue to serve the growing population with well supply. Average well production in the study area is approximately 43 gallons per minute. The TNRCC requires a minimum of 0.6 gallons per minute be available for each connection served. Assuming 3 persons per connection, a single municipal well can serve approximately 72 residential connections, or 217 people. Table 15.1 below uses these figures to project the number of needed wells for each city.

TABLE 15.1

WELL DEMAND BY ENTITY

(Excludes Weatherford)
(Number of wells)

Current Wells	18	6	21	0	2	1	48
Current Capacity, avg (mgd)	1.05	0.35	1.06	0.00	0.29	0.19	2.93
Current Capacity, max (mgd)	1.23	0.44	1.57	0.00	0.32	0.24	3.81
Utilization Ratio	85.00%	78.51%	67.66%	0.00%	88.58%	78.57%	77.00%
Average New Well (gpm)	142	142	42	42	142	142	
Average New Well (mgd)	0.20	0.20	0.06	0.06	0.20	0.20	
New Well Aquifer	Trinity	Trinity	Paluxy	Paluxy	Trinity	Trinity	

Year	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta (Deer Creek)	Annetta South	Total
1998	18	6	21	2	2	1	50
1999	18	6	21	2	2	1	50
2000	18	6	21	2	2	1	50
2001	18	6	21	2	2	1	50
2002	18	6	21	2	2	1	50
2003	18	6	21	2	2	1	50
2004	18	6	21	2	2	1	51
2005	18	7	21	2	2	1	51
2006	18	7	21	2	2	1	51
2007	18	7	21	2	2	1	51
2008	18	7	21	2	2	1	51
2009	18	7	21	2	2	1	52
2010	18	7	21	2	2	1	52
2011	19	7	21	3	2	1	53
2012	19	7	21	3	2	1	53
2013	19	7	21	3	2	1	54
2014	19	8	21	3	3	1	54
2015	20	8	21	3	3	1	55
2016	20	8	21	3	3	1	56
2017	20	8	21	3	3	1	56
2018	20	8	21	3	3	1	57
2019	21	8	21	3	3	1	58
2020	21	8	23	4	3	1	60
2021	21	8	25	4	3	2	63
2022	22	9	27	4	3	2	66
2023	22	9	30	4	3	2	69
2024	22	9	32	4	3	2	73
2025	23	9	35	4	4	2	76
2026	23	9	38	4	4	2	80
2027	23	10	41	4	4	2	84
2028	24	10	44	5	4	2	88
2029	24	10	45	5	4	2	89
2030	24	10	45	5	4	2	90
2031	25	10	45	5	4	2	91
2032	25	11	45	5	4	2	92
2033	26	11	45	5	5	2	93
2034	26	11	45	6	5	3	95
2035	27	11	45	6	5	3	96
2036	27	11	45	6	5	3	97
2037	28	11	45	6	5	3	98
2038	28	11	45	6	5	3	99
2039	29	11	45	7	5	3	100
2040	29	11	45	7	6	3	101
2041	30	11	45	7	6	3	102
2042	31	11	45	7	6	3	103
2043	31	11	45	8	6	3	104
2044	32	11	45	8	6	4	106
2045	33	11	45	8	7	4	107
2046	33	11	45	9	7	4	108
2047	34	11	45	9	7	4	110
2048	35	11	45	9	7	4	111
2049	36	11	45	9	7	4	112
2050	36	11	45	10	8	4	114

As noted in the table, there are currently a total of 45 wells in use by the three major cities. By the end of the study period, those three cities alone will need 148 wells, while all of the cities combined will require a total of 172 wells. These figures assume that average well capacity will remain at the same rate at which they are currently producing, which is not a safe assumption. Well reports and Chapter 9, "Geographic Considerations" of this report indicate that the existing wells are already experiencing decreases in capacity due to the significant cone of depression and water table fluctuation effect on the source aquifers. As demands increase, available supply will decrease due to the expanding cone of depression. Demands from 172 wells would place a strain on the production of the aquifer. Also, drawdown in the aquifer increases the amount of sands introduced into a well, thus providing serious contamination concerns to the supply issues involved with increased well service.

In addition to source constraints, the land and property constraints are also considerable. Each well drilled must include a control easement of 300 feet in diameter surrounding the well. Within this 300-foot circle, which translates to approximately 2 acres, development is severely restricted. Therefore, approximately 2 acres of land must be made available for each well drilled. Some activities are not allowed within a 500' radius of a well (1000' diameter). Each well would thereby restrict 18 acres from certain uses and activities.

Ironically, the summer of 1998 (which occurred during the conducting of this study) was extremely hot and dry, approaching records for the number of days above 100 degrees Fahrenheit. Fortunately, the preceding winter and spring were normal to wet, such that there was not a significant preexisting stress on the aquifer. However, customer demands were abnormally high during the months of June, July, August and September as residents attempted to keep yards watered and swimming pools full. Such actions prompted rationing on nearly all systems in the study area, much to the chagrin of a number of the customers. Public sentiment urged system upgrades. Well capacities fell as water tables dropped. Well pumps faltered due to excess usage. One system reported a drop in static water levels of 10 feet. Please refer to Appendix E for additional information. This appendix shows vital information for demand and supply relative to the study areas for both normal and drought conditions.

As noted in Chapter 7, The Texas Department of Water Resources has published Report 269, "Occurrence, Availability and Chemical Quality of Ground Water in the Cretaceous Aquifers of North Central Texas", giving historic and geologic data for the aquifers in the area. As discussed earlier, nearly all current wells utilize the shallower Paluxy aquifer. Willow Park, Aledo and Deer Creek each have at least one Trinity (Twin Mountain) well. Both aquifers dip to the southeast and outcrop to the west, between Weatherford and the Brazos River. The deeper Trinity wells tend to have greater capacities but also appear to be more difficult and expensive to drill and complete in the western portions of the study area. Despite this fact, most new well production is now being taken from the lower Trinity formation due to significantly higher yields.

Another potential problem with the continued and increased use of well water is the threat of contamination. During the earlier phases of the study, this threat was perceived to be minimal at present. However, the lack of sanitary sewers in the study area and the growing number of septic systems raises concern, especially for older, potentially uncased or abandoned wells. A more specific threat was realized in November 1998 when an article appeared in the Weatherford newspaper describing the discovery of a Paluxy well on the north side of Weatherford in which refuse oil, filters, antifreeze and lead-acid batteries had been deposited routinely for a time period of between 7 and 20 years. Although, not specified in the article, it is presumed by the

accompanying photo and description, that this was an old "hand dug" well. This well is approximately eight miles upstream in the Paluxy aquifer from the study area. Note that anything placed in a well has direct access to the aquifer.

Another factor relative to the local Paluxy and Trinity wells is the mineral content of the water, commonly known as "hard water". The minerals in the water leave calcium and other mineral deposits on the interior of pipes and other facilities. Many homes in the area have water softener and purification units which are not only expensive but require high maintenance due to the mineral content of the water.

In short, the study shows that the continued drilling of wells will be necessary to accommodate growth in the near term, but cannot be relied on as the sole potable water source as long term densification of the area occurs.

STUDY OPTION 2 - PURCHASE TREATED WATER

The second option considered for the study area was the purchase of treated water from a neighboring utility to augment or replace the existing well systems. Since it appears that any treated water would originally be purchased as raw water from TRWD, the prospect of purchasing water treated by the District was discussed with this entity. Other obvious local choices for the purchase of treated water are the City of Fort Worth and the City of Weatherford. All three of these entities were sent letters regarding the potential of their entity serving the study area. Their responses are included in Appendix B - "Response Letters from Other Entities". The purchase of treated water from the Walnut Creek Special Utility District located in Northern Parker and southern Wise Counties was also considered.

To summarize from previous sections, TRWD currently supplies only raw water. This water is purchased by Fort Worth and others (soon to include Weatherford) who treat the water. Fort Worth was TRWD's original customer and currently treats and supplies water to 27 other Tarrant County cities. Weatherford currently treats its own water from the city owned Lake Weatherford. However, this supply is quickly becoming inadequate for Weatherford's needs and so Weatherford has contracted with TRWD for raw water from Lake Benbrook and is in the process of constructing facilities from Lake Benbrook to Lake Weatherford for delivery.

It is important to note that TRWD was created, in part, to meet the needs of the City of Fort Worth. Since that time, TRWD has started supplying raw water to Arlington, Mansfield, western TRA and a number of small cities and water supply utilities near its lakes. Fort Worth is still TRWD's largest customer. As such, TRWD is bound to maintaining its relationship with Fort Worth. This has led to several past agreements which affect the ability of these entities to serve the study area.

It appears that during the late 1970's and early 1980's, Fort Worth was positioning itself for rapid growth. The Texas economy was booming at the time. Water was recognized as a needed resource. It was during this time when TRWD saw the necessity to acquire additional water supplies beyond the upstream drainage reaches of Fort Worth. To augment the water pumped from the Cedar Creek reservoir southeast of Dallas, another reservoir was proposed. Due to the immense cost of building this storage facility, TRWD restructured its agreements with its primary customers, namely Fort Worth, Arlington, Mansfield and Trinity River Authority (Western Division). (See Appendix C - "Summary of TRWD Settlement Agreement, Amendatory Contract".)

This revised agreement not only allowed a mechanism to fund the project but also gave TRWD storage rights in Lake Worth and Lake Arlington. Later, storage rights in Lake Benbrook were also secured from the Corps of Engineers (USACE) after the idea of using this lake's water to control a series of locks on a shipping channel from Dallas to Houston was abandoned. In return, certain restrictions were placed on TRWD to protect the investment of the Initial Contracting Parties, their four primary customers. The most important restrictions prohibited TRWD from adding to the system infrastructure without approval of the Initial Contracting Parties. Basically, "system" additions could not be added if the addition did not increase the water supply to these entities. Therefore, TRWD was allowed discretion to sell to new customers, but such customers would have to transfer water, at their cost, from one of the existing system lakes. TRWD could not participate in the cost of such transportation under its existing contract arrangement. If TRWD were to participate in such a system, its financing and accounting would need to remain separate from the existing "system".

Another aspect of this agreement prohibited TRWD from selling treated water as part of the existing "system". The agreement only authorizes TRWD to sell raw water. This appears to have been an effort by the four primary customers to prevent TRWD from competing with them in the sale of treated water and to prevent system infrastructure funds from being used in such treatment. Therefore, it appears that under the current agreement, TRWD would not be allowed to participate in supplying treated water to the study area without creating an enterprise separate from the existing "system" enterprise.

This same principle was included in the later contract between TRWD and the City of Weatherford. Again, in an apparent effort to prevent competition with the four primary customers in the sale of treated water, this contract prevents Weatherford from retailing water purchased as raw water from TRWD outside of Weatherford's retail service boundary. Since it has already been noted that Lake Weatherford is hardly adequate to supply the currently growing Weatherford, the City would not be able to supply treated water to the study area without first obtaining such water from TRWD. This contract clause, unless amended, thus prevents Weatherford from supplying treated (or raw) water to the study area.

The remaining viable entity would be the City of Fort Worth. However, since the 1980's, this City's growth has slowed down somewhat on the western (study area) side and has accelerated on the northern side near the rapidly growing Alliance Airport and industrial area. Fort Worth is now expending most of its available resources to provide service to this fast growing northern area. Even though Fort Worth is still planning for a major traffic corridor (freeway loop) in eastern Parker County, the City has decided not to focus water infrastructure funds into this area at the present time.

Therefore, the letters in the Appendix B show negative responses from all three entities regarding service of treated water. For this reason, this study did not pursue cost alternatives for such a system. However, costs for providing such a system from Fort Worth could be approximated from Option 3 by deleting the raw water intake and treatment plant, and making the raw water transmission main a treated water main.

STUDY OPTION 3 - TREAT RAW SURFACE WATER

The remaining option would be purchase raw water, treat it and distribute it to the study area. To do so, the following questions must be answered:

- 1.) Where will the raw water come from?
- 2.) Who will transport it, and how?
- 3.) Who will treat it, and how?
- 4.) Who will transport the treated water to the wholesale customers, and how?

RAW WATER SOURCE

The first question seems to have a simple answer. The study area is in the basin controlled by the Tarrant Regional Water District. TRWD is in the business of selling raw water and has the water rights for most of the area lakes. Also, TRWD has expressed an interest in acquiring the entities in the study area as raw water customers and has even provided a current rate for raw water purchases.

The nearest TRWD system reservoir is Lake Benbrook. This lake is also being used by TRWD as a leveling reservoir to receive water from Richland-Chambers. Therefore, it is one of the most reliable (from an availability of water standpoint) raw water sources in the region. In addition, Lake Benbrook is the source for raw water to be purchased by the City of Weatherford, opening the door for some possible joint venture with Weatherford.

Other options would be to purchase raw water from Weatherford out of Lake Weatherford or to build a new lake. As previously noted, the storage in Lake Weatherford is insufficient to satisfy Weatherford during extended drought conditions and Weatherford is seeking alternate water sources from TRWD. However, a very remote option might be to work with Weatherford to transfer storage rights in Lake Weatherford to TRWD whereby the lake could become part of the TRWD "system" and would potentially allow TRWD to construct the raw water line from Lake Benbrook to Lake Weatherford.

At the present, any new reservoirs would most likely be located between Lake Weatherford and Lake Benbrook to serve the study area. Such an endeavor would not only require the need to condemn or purchase a large amount of developed land in or near the study area, it would also be costly and time consuming considering the environmental and other constraints now required of such facilities. Also, a number of legal hurdles would need to overcome, most importantly water rights for a new reservoir. Due to these legal and financial hurdles, it was impractical to seriously consider such an option at this time. However, such an option may need to be pursued at a later date by an entity with the time and resources for such a long, expensive undertaking.

TRANSPORTATION OF RAW WATER:

As previously mentioned, the City of Weatherford is already in the process of constructing a raw water line from Lake Benbrook to Lake Weatherford. To date, a new intake structure has been constructed at Lake Benbrook and all of the right-of-way and/or easements needed by Weatherford for the transmission line between the two lakes has been acquired. The intake structure was a joint project between the City of Weatherford and the Benbrook Water and Sewer Authority. Weatherford has also constructed a pump station building (without pumps) and a 36 inch raw water

line from the lake to the north side of Benbrook. Weatherford has also recently (1995) completed a water plant on the west bank of Lake Weatherford. This plant replaced the previous plant just east of downtown. The plant currently has capacity for 8 mgd, but can be easily expanded to 12 mgd.

The City of Weatherford has been delaying construction of the remainder of the line until critical triggers are met. These include population growth, dry weather trends and storage in Lake Weatherford. Some, if not all, of these triggers were met during the summer of 1998. At present, Weatherford is working on a funding package with intention of starting construction on the remaining line completion in the later half of 1999. Weatherford is preparing to continue the line with a 24" transmission main.

One obvious approach for the transmission of raw water to the study area would be for Weatherford and the study area cities to joint venture on this line from Lake Benbrook to the treatment plant (or point of split) for the study area. This would allow Weatherford a means of completing additional 36" line, instead of 24" line, as well as recouping some cost of line and pumping facilities already constructed.

A second approach studied was to have TRWD purchase the facilities already constructed by Weatherford in Benbrook and complete the line to Lake Weatherford with a tap for the treatment plant servicing the study area. Ideally, this approach would include TRWD building the new plant and selling the treated water. This would reduce the cost somewhat by allowing TRWD to spread the cost of construction over its entire system. However, this approach seems to be precluded by the terms of the TRWD's agreement with its Initial Contracting Parties. As noted in the previous section, this agreement precludes TRWD from building facilities as part of the existing system which do not increase the amount of water available to the four primary customers.

A third approach would be for a consortium, cooperative, existing district or new district comprising and representing the study area water utilities to joint venture with Weatherford as described in the first approach described. This would provide an umbrella organization responsible for coordination between the various cities/utilities and Weatherford. This would also consolidate a single entity to be a liaison with Tarrant Regional Water District and state/federal agencies. However, if a new district is to be enacted by the state legislature, it will now need to wait until the beginning of 2001 before the opportunity reoccurs.

A fourth approach would be for the study area entities, or an organization representing these entities, to contract for raw water with TRWD and construct their own intake and raw water transmission lines.

At the present, the best solution for transporting the raw water appears to be some joint arrangement with the City of Weatherford, if such an arrangement can be worked out financially and politically. Such an arrangement would have to allow metering such that Weatherford and the study area are utilizing the same transmission facility but are individually purchasing the raw water directly from TRWD.

TREATMENT OF RAW WATER:

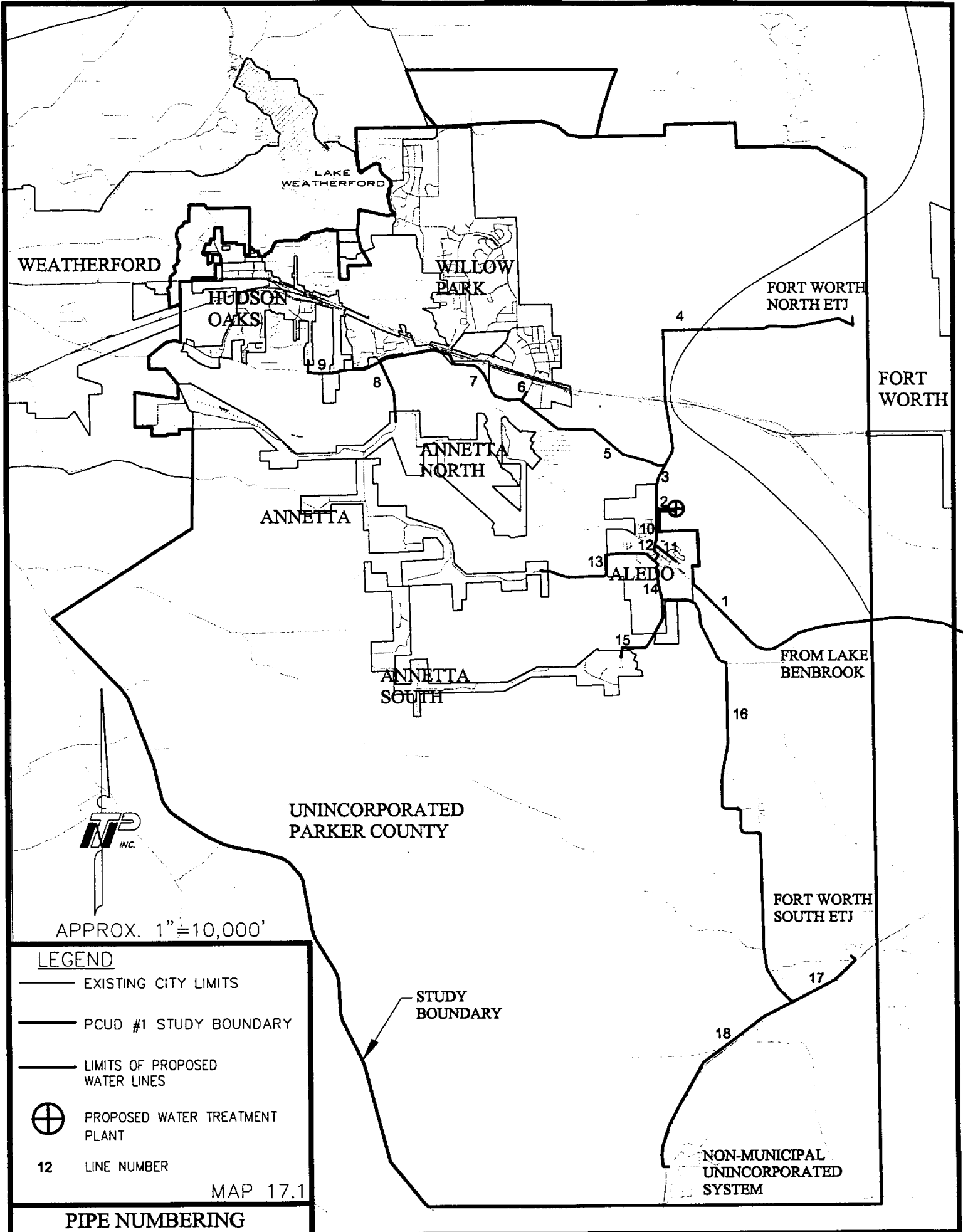
At some point between the intake of raw water and delivery to retail customers, the water must be treated. It has already been demonstrated that TRWD is prohibited by current agreements to treat water as part of its existing system. Weatherford is also prohibited from selling water to the study

area which it obtains from the TRWD system. Fort Worth has declined to provide such service due to their current demands in the northern and northeastern segments.

This means that the entities of the study area have the choice of each treating the raw water themselves or of somehow joining together to provide a single treatment plant. Several issues indicate that a single plant approach would be most viable. First, none of the existing entities currently have a treatment facility other than chlorination of well water. Such a plant would be a major step for these entities both in relation to capital expenditure

SCENARIOS:

On the following pages are summaries of the two studied scenarios. Both get raw water from Lake Benbrook, transport it to north of Aledo, treat it at that location and distribute treated water to area cities and towns. The difference in these scenarios is that the raw water transmission line is shared with Weatherford in the first scenario and a "stand-alone" raw water system is utilized in the second. Map 17.1 shows the proposed layout. Figures 17.2, 17.3 and 17.4 give summary information of the first scenario. Figures 17.5 and 17.6 give summary information for the second scenario. More in depth information for each scenario is included in Appendices L and M. Even additional information (and trials of additional scenarios) is available through use of the spreadsheet in Appendix N. In summary, the scenarios indicate that there should be some initial cost savings in participating with Weatherford on construction of their proposed raw water line.



WEATHERFORD

LAKE WEATHERFORD

HUDSON OAKS

WILLOW PARK

FORT WORTH NORTH ETJ

FORT WORTH

ANNETTA NORTH

ANNETTA

ALEDO

ANNETTA SOUTH

FROM LAKE BENBROOK

UNINCORPORATED PARKER COUNTY

FORT WORTH SOUTH ETJ



APPROX. 1" = 10,000'

LEGEND

- EXISTING CITY LIMITS
- PCUD #1 STUDY BOUNDARY
- LIMITS OF PROPOSED WATER LINES
- ⊕ PROPOSED WATER TREATMENT PLANT
- 12 LINE NUMBER

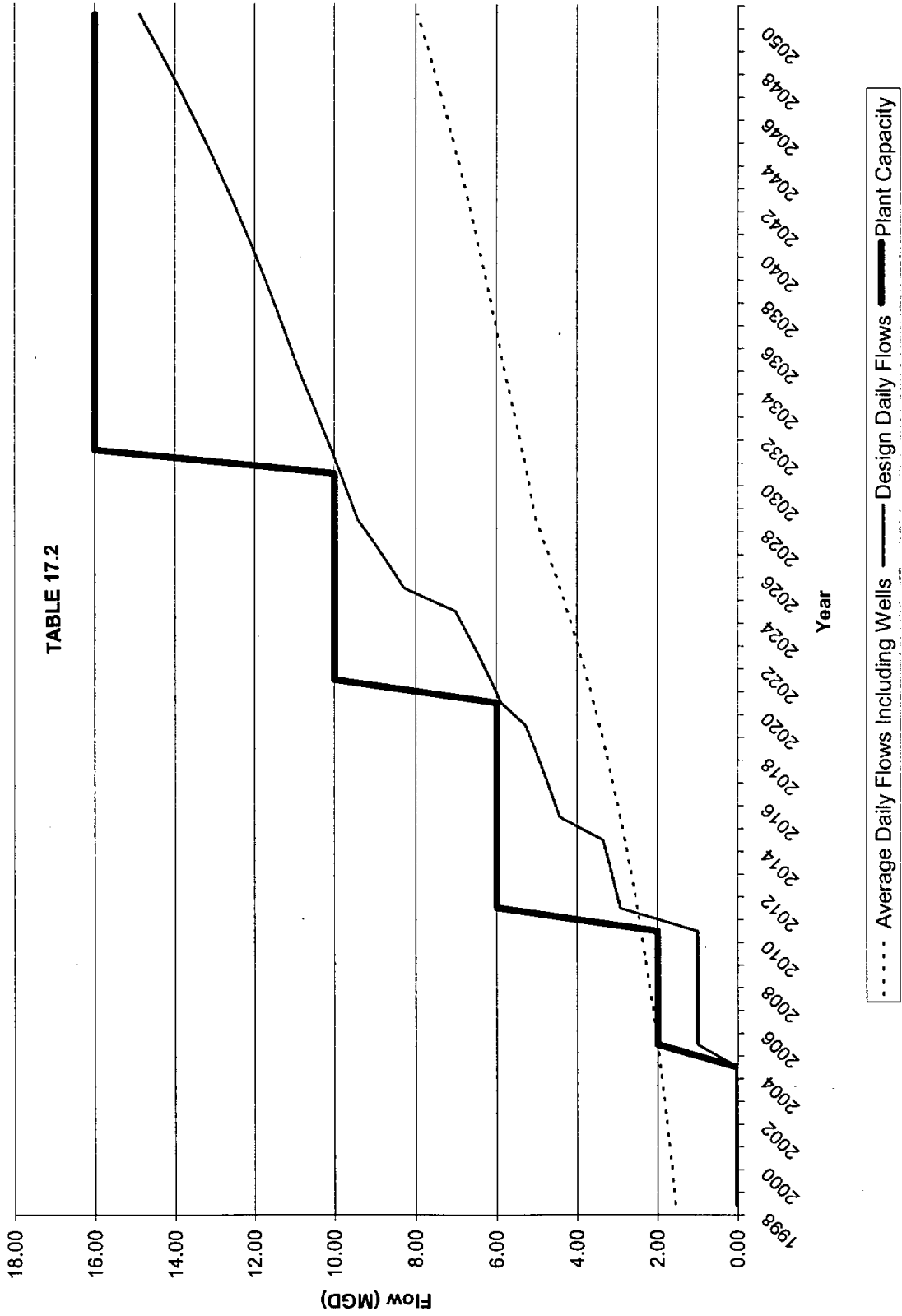
MAP 17.1

PIPE NUMBERING

NON-MUNICIPAL UNINCORPORATED SYSTEM

Treatment Plant Expansion

TABLE 17.2



ANNUAL WATER PURCHASE AND IMPROVEMENT SUMMARY

Year	Raw Water Purchase Wford 1000 gal	Raw Water Purchase SEPC 1000 gal	Raw Water Intake Capacity Upgrade MGD	Raw Water Pumping Upgrade gpm	Raw Water Treatment Plant Upgrade MGD	Storage Upgrade gal	Pumping Upgrade gpm	Pipe Upgrade 1 (in. dia.)	Pipe Upgrade 2 (in. dia.)	Pipe Upgrade 3 (in. dia.)	Pipe Upgrade 4 (in. dia.)	Pipe Upgrade 5 (in. dia.)	Pipe Upgrade 6 (in. dia.)	Pipe Upgrade 7 (in. dia.)	Pipe Upgrade 8 (in. dia.)	Pipe Upgrade 9 (in. dia.)	Pipe Upgrade 10 (in. dia.)	Pipe Upgrade 11 (in. dia.)	Pipe Upgrade 12 (in. dia.)	Pipe Upgrade 13 (in. dia.)	Pipe Upgrade 14 (in. dia.)	Pipe Upgrade 15 (in. dia.)	Pipe Upgrade 16 (in. dia.)	Pipe Upgrade 17 (in. dia.)	Pipe Upgrade 18 (in. dia.)			
1986																												
1988																												
2000	2,111,792		12	10,000				36																				
2001	2,177,257																											
2002	2,244,752																											
2003	2,314,340																											
2004	2,386,084																											
2005	2,460,053	438,590					5,000		10	10		10	10	6	6													
2006	2,536,314	457,993																										
2007	2,614,940	478,384																										
2008	2,698,003	498,821																										
2009	2,779,579	522,364																										
2010	2,865,746	546,080																										
2011	2,954,584	571,037				4	2,500,000																					
2012	3,046,177	597,310																										
2013	3,140,608	624,977																										
2014	3,237,967	654,123						16																				
2015	3,338,344	683,727																										
2016	3,441,832	713,331																										
2017	3,548,529	742,879		10,000							16	16																
2018	3,658,534	772,427				2,500,000																						
2019	3,771,948	801,975																										
2020	3,888,879	831,523																										
2021	4,009,434	861,071			4						6																	
2022	4,133,726	890,619																										
2023	4,261,872	920,167																										
2024	4,393,990	949,715																										
2025	4,530,204	979,263																										
2026	4,670,640	1,008,811				2,500,000	5,000																					
2027	4,815,430	1,038,359																										
2028	4,964,708	1,067,907																										
2029	5,118,614	1,097,455																										
2030	5,277,281	1,127,003																										
2031	5,440,887	1,156,551	12																									
2032	5,609,554	1,186,099			6	2,500,000																						
2033	5,783,451	1,215,647																										
2034	5,962,738	1,245,195																										
2035	6,147,583	1,274,743																										
2036	6,338,158	1,304,291																										
2037	6,534,640	1,333,839		10,000																								
2038	6,737,214	1,363,387																										
2039	6,946,068	1,392,935																										
2040	7,161,396	1,422,483																										
2041	7,383,389	1,452,031																										
2042	7,612,285	1,481,579				2,500,000																						
2043	7,849,266	1,511,127																										
2044	8,091,562	1,540,675																										
2045	8,342,400	1,570,223																										
2046	8,601,015	1,600,771																										
2047	8,867,646	1,631,319																										
2048	9,142,543	1,661,867																										
2049	9,425,962	1,692,415																										
2050	9,716,167	1,722,963																										

TABLE 17.3

Scenario 1

TOTAL COST SUMMARY DATA
(Includes Capital, Operation and Maintenance)
(All cost amounts shown are in current Dollars)

Year	A Willow Park	B Aledo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	J Wford (excluding raw water)	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
2000	\$447,437	\$256,606	\$356,790	\$28,807	\$73,051	\$45,983	\$0	\$0	\$0	\$1,208,673	\$7,357,411	\$8,566,084
2001	\$9,900	\$5,601	\$8,038	\$693	\$1,758	\$1,107	\$147	\$64	\$0	\$27,309	\$106,893	\$134,202
2002	\$10,744	\$6,009	\$8,890	\$803	\$2,036	\$1,282	\$288	\$126	\$0	\$30,177	\$107,161	\$137,338
2003	\$119,491	\$107,823	\$402,178	\$27,248	\$26,480	\$16,668	\$4,092	\$2,121	\$0	\$706,101	\$107,525	\$813,626
2004	\$12,425	\$6,824	\$10,704	\$1,020	\$2,585	\$1,627	\$556	\$242	\$0	\$35,985	\$107,980	\$143,965
2005	\$3,424,713	\$2,116,142	\$2,869,830	\$129,944	\$313,650	\$197,432	\$74,313	\$32,690	\$0	\$9,158,714	\$112,482	\$9,271,196
2006	\$154,129	\$84,039	\$140,677	\$12,653	\$31,247	\$19,669	\$7,818	\$3,400	\$4,816	\$458,447	\$114,034	\$572,481
2007	\$156,381	\$83,424	\$145,696	\$13,497	\$33,381	\$21,012	\$8,658	\$3,765	\$9,218	\$475,032	\$115,731	\$590,763
2008	\$158,989	\$83,301	\$151,264	\$14,285	\$35,376	\$22,268	\$9,449	\$4,110	\$13,314	\$492,356	\$117,571	\$609,927
2009	\$161,900	\$83,546	\$157,363	\$15,047	\$37,306	\$23,483	\$10,204	\$4,438	\$17,182	\$510,468	\$119,550	\$630,018
2010	\$165,336	\$84,213	\$163,346	\$15,825	\$39,274	\$24,722	\$10,950	\$4,763	\$20,917	\$529,346	\$121,746	\$651,092
2011	\$3,509,949	\$1,762,762	\$3,213,539	\$312,574	\$791,778	\$498,396	\$182,624	\$79,660	\$338,053	\$10,689,333	\$146,912	\$10,836,246
2012	\$246,700	\$124,132	\$247,366	\$25,148	\$62,888	\$39,586	\$18,098	\$7,881	\$38,435	\$810,233	\$150,021	\$960,254
2013	\$261,534	\$126,562	\$257,099	\$108,038	\$253,698	\$180,353	\$19,973	\$14,731	\$77,627	\$1,289,616	\$153,339	\$1,442,955
2014	\$308,292	\$155,065	\$320,252	\$34,728	\$87,138	\$54,850	\$26,433	\$11,516	\$61,813	\$1,060,088	\$451,333	\$1,511,421
2015	\$329,391	\$165,662	\$462,273	\$82,346	\$191,207	\$132,587	\$29,774	\$16,574	\$93,366	\$1,503,179	\$171,003	\$1,674,182
2016	\$332,444	\$167,028	\$418,458	\$40,314	\$100,980	\$63,845	\$31,577	\$13,847	\$80,587	\$1,249,079	\$175,673	\$1,424,753
2017	\$561,093	\$280,854	\$596,141	\$67,038	\$168,746	\$106,490	\$55,879	\$24,448	\$153,858	\$2,014,548	\$1,423,335	\$3,437,883
2018	\$1,472,182	\$723,859	\$1,537,943	\$173,038	\$429,207	\$270,430	\$585,260	\$251,179	\$806,964	\$6,250,063	\$185,857	\$6,435,920
2019	\$374,721	\$185,665	\$400,434	\$45,334	\$113,697	\$71,819	\$40,038	\$17,535	\$115,040	\$1,364,283	\$191,394	\$1,555,677
2020	\$410,790	\$201,879	\$437,463	\$49,585	\$124,469	\$78,591	\$209,316	\$98,065	\$409,134	\$2,019,291	\$201,208	\$2,220,499
2021	\$2,135,355	\$1,034,551	\$2,222,789	\$251,538	\$636,580	\$400,940	\$233,810	\$101,897	\$763,868	\$7,781,328	\$207,577	\$7,988,905
2022	\$444,721	\$214,052	\$465,987	\$53,632	\$134,708	\$85,024	\$53,404	\$23,127	\$170,963	\$1,645,618	\$214,294	\$1,859,912
2023	\$463,916	\$220,479	\$479,746	\$55,922	\$140,500	\$88,665	\$54,345	\$23,480	\$481,130	\$2,008,183	\$221,376	\$2,229,559
2024	\$484,727	\$227,139	\$493,085	\$58,406	\$146,781	\$92,613	\$55,385	\$23,882	\$202,140	\$1,784,157	\$228,843	\$2,013,000
2025	\$1,808,249	\$884,772	\$1,979,054	\$213,256	\$539,437	\$339,772	\$198,677	\$86,349	\$921,053	\$6,970,617	\$247,245	\$7,217,862
2026	\$602,509	\$273,442	\$587,356	\$72,327	\$182,044	\$114,807	\$64,655	\$27,865	\$261,671	\$2,186,676	\$256,278	\$2,442,954
2027	\$642,449	\$300,489	\$609,743	\$77,078	\$203,867	\$128,545	\$67,134	\$30,266	\$289,975	\$2,349,546	\$265,793	\$2,615,339
2028	\$668,207	\$291,559	\$615,671	\$80,168	\$201,876	\$127,293	\$68,190	\$29,380	\$285,533	\$2,367,879	\$275,819	\$2,643,698
2029	\$691,083	\$311,576	\$615,752	\$82,925	\$208,836	\$131,675	\$68,907	\$29,679	\$293,214	\$2,433,647	\$283,969	\$2,717,616
2030	\$767,938	\$319,579	\$660,342	\$92,044	\$231,929	\$146,213	\$74,263	\$32,002	\$322,435	\$2,646,746	\$584,920	\$3,231,666
2031	\$4,366,187	\$1,819,623	\$3,720,636	\$515,788	\$1,306,447	\$822,585	\$390,702	\$170,044	\$1,768,731	\$14,880,743	\$301,008	\$15,181,752
2032	\$766,945	\$308,445	\$628,833	\$92,029	\$231,843	\$146,161	\$72,105	\$31,043	\$319,572	\$2,596,975	\$309,301	\$2,906,277
2033	\$793,569	\$313,097	\$635,363	\$94,617	\$238,392	\$150,284	\$73,215	\$31,521	\$327,347	\$2,657,405	\$317,880	\$2,975,285
2034	\$811,189	\$317,409	\$642,176	\$97,316	\$245,219	\$154,582	\$74,365	\$32,017	\$335,432	\$2,709,705	\$326,758	\$3,036,463
2035	\$832,964	\$320,601	\$647,923	\$99,921	\$251,811	\$158,731	\$75,412	\$32,468	\$343,144	\$2,762,976	\$335,654	\$3,098,630
2036	\$853,867	\$322,930	\$652,592	\$102,426	\$258,147	\$162,720	\$76,352	\$32,873	\$350,458	\$2,812,364	\$344,569	\$3,156,933
2037	\$1,109,380	\$411,434	\$830,392	\$132,633	\$334,733	\$210,929	\$96,116	\$41,489	\$449,871	\$3,616,976	\$1,625,148	\$5,242,124
2038	\$897,809	\$327,791	\$796,260	\$129,413	\$271,473	\$171,110	\$78,303	\$33,713	\$365,765	\$3,071,635	\$363,269	\$3,434,905
2039	\$920,901	\$330,325	\$667,420	\$110,463	\$278,479	\$175,521	\$79,315	\$34,148	\$373,773	\$2,970,346	\$373,074	\$3,343,420
2040	\$944,776	\$332,929	\$672,643	\$113,328	\$285,727	\$180,083	\$80,351	\$34,595	\$382,028	\$3,026,459	\$383,195	\$3,409,654
2041	\$969,463	\$335,605	\$678,009	\$116,291	\$301,015	\$189,707	\$81,413	\$35,928	\$400,644	\$3,108,076	\$393,641	\$3,501,717
2042	\$2,188,823	\$745,439	\$1,501,378	\$260,517	\$658,941	\$415,009	\$173,851	\$75,375	\$862,381	\$6,881,714	\$404,425	\$7,286,139
2043	\$1,027,951	\$344,724	\$696,309	\$123,292	\$310,941	\$195,957	\$84,317	\$36,308	\$411,177	\$3,230,976	\$415,556	\$3,646,532
2044	\$1,054,552	\$348,024	\$702,928	\$126,484	\$319,017	\$201,041	\$85,506	\$36,821	\$420,375	\$3,294,747	\$427,045	\$3,721,792
2045	\$1,137,974	\$369,535	\$746,134	\$136,403	\$344,154	\$216,864	\$90,864	\$39,153	\$451,363	\$3,532,444	\$739,554	\$4,271,998
2046	\$1,122,119	\$358,540	\$724,035	\$134,576	\$339,501	\$213,936	\$88,817	\$38,254	\$444,084	\$3,463,862	\$451,146	\$3,915,008
2047	\$1,140,072	\$358,390	\$723,723	\$136,752	\$345,000	\$217,398	\$89,250	\$38,437	\$449,763	\$3,498,785	\$463,782	\$3,962,568
2048	\$1,170,602	\$362,004	\$730,972	\$140,420	\$354,283	\$223,242	\$90,560	\$39,003	\$460,191	\$3,571,276	\$476,825	\$4,048,101
2049	\$1,580,026	\$468,097	\$969,073	\$188,993	\$465,151	\$293,030	\$118,724	\$50,018	\$599,116	\$4,732,229	\$490,288	\$5,222,517
2050	\$1,481,269	\$443,110	\$893,897	\$177,356	\$447,907	\$282,176	\$110,575	\$47,724	\$575,495	\$4,459,508	\$3,136,014	\$7,595,523

TABLE 17.4

Scenario 2

TOTAL COST SUMMARY DATA
(Includes Capital, Operation and Maintenance)
(All cost amounts shown are in current Dollars)

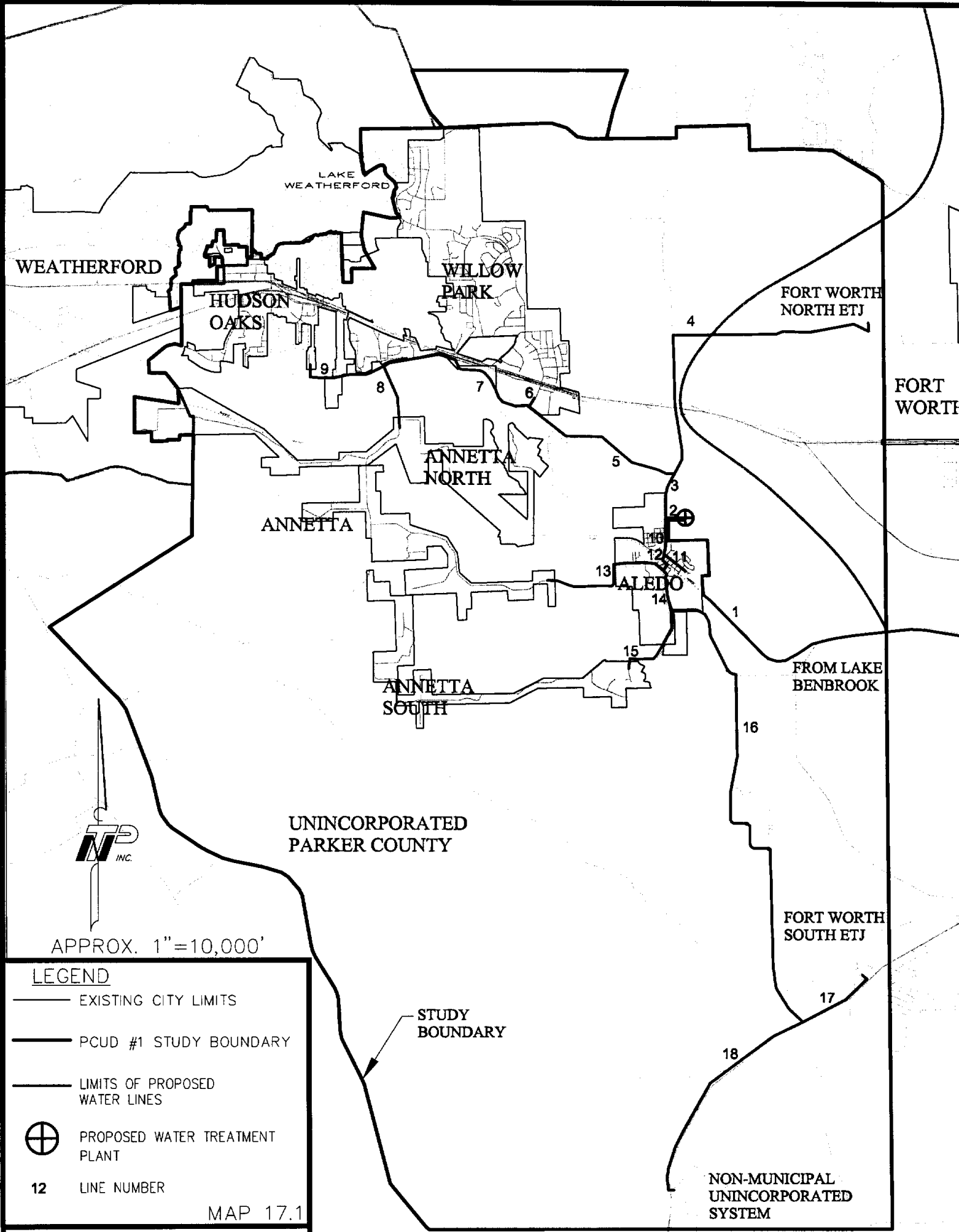
Year	A Willow Park	B Aledo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	J W'ford (excluding raw water)	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$464,216	\$266,229	\$370,170	\$29,887	\$75,790	\$47,707	\$0	\$0	\$0	\$1,254,000	\$0
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,254,000
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$107,906	\$101,407	\$392,400	\$26,337	\$24,169	\$15,213	\$3,668	\$1,936	\$0	\$673,035	\$0
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$673,035
2005	\$4,579,284	\$2,745,644	\$3,885,710	\$228,045	\$562,420	\$354,023	\$133,743	\$58,618	\$0	\$12,547,486	\$0
2006	\$146,545	\$79,979	\$133,855	\$11,988	\$29,560	\$18,607	\$7,384	\$3,210	\$4,547	\$435,675	\$0
2007	\$148,289	\$79,163	\$138,253	\$12,767	\$31,530	\$19,847	\$8,155	\$3,546	\$8,681	\$450,229	\$0
2008	\$150,404	\$78,843	\$143,186	\$13,490	\$33,361	\$20,999	\$8,878	\$3,861	\$12,507	\$465,530	\$0
2009	\$152,833	\$78,897	\$148,634	\$14,187	\$35,126	\$22,111	\$9,567	\$4,160	\$16,106	\$481,620	\$0
2010	\$155,801	\$79,378	\$154,009	\$14,901	\$36,931	\$23,247	\$10,249	\$4,458	\$19,574	\$498,547	\$0
2011	\$3,506,914	\$1,761,239	\$3,210,531	\$312,273	\$791,016	\$497,917	\$182,392	\$79,559	\$337,565	\$10,679,405	\$0
2012	\$243,319	\$122,434	\$243,943	\$24,798	\$62,000	\$39,027	\$17,824	\$7,761	\$37,812	\$798,918	\$0
2013	\$247,833	\$124,704	\$253,290	\$107,638	\$252,684	\$179,715	\$19,656	\$14,593	\$76,862	\$1,276,974	\$0
2014	\$253,097	\$127,349	\$262,747	\$28,525	\$71,406	\$44,948	\$21,490	\$9,360	\$49,221	\$868,143	\$0
2015	\$328,052	\$164,990	\$460,866	\$82,189	\$190,812	\$132,338	\$29,649	\$16,520	\$93,033	\$1,498,448	\$0
2016	\$330,987	\$166,297	\$416,918	\$40,144	\$100,548	\$63,573	\$31,436	\$13,785	\$80,195	\$1,243,883	\$0
2017	\$341,592	\$171,122	\$363,716	\$41,408	\$103,752	\$65,578	\$33,902	\$14,860	\$90,782	\$1,226,712	\$0
2018	\$1,470,578	\$723,062	\$1,536,247	\$172,851	\$428,731	\$270,131	\$585,095	\$251,107	\$806,475	\$6,244,276	\$0
2019	\$373,093	\$184,861	\$398,718	\$45,144	\$113,214	\$71,515	\$39,866	\$17,460	\$114,514	\$1,358,385	\$0
2020	\$410,263	\$201,622	\$436,912	\$49,524	\$124,313	\$78,493	\$209,258	\$96,440	\$408,955	\$2,015,779	\$0
2021	\$2,134,924	\$1,034,343	\$2,222,343	\$251,487	\$636,452	\$400,860	\$233,764	\$100,278	\$763,715	\$7,778,165	\$0
2022	\$444,429	\$213,912	\$465,689	\$53,598	\$134,621	\$84,969	\$53,374	\$21,514	\$170,855	\$1,642,961	\$0
2023	\$463,811	\$220,429	\$479,639	\$55,910	\$140,469	\$88,645	\$54,334	\$21,875	\$481,090	\$2,006,202	\$0
2024	\$484,859	\$227,200	\$493,216	\$58,421	\$146,820	\$92,638	\$55,398	\$22,288	\$202,193	\$1,783,033	\$0
2025	\$1,811,617	\$886,307	\$1,982,322	\$213,651	\$540,440	\$340,403	\$199,004	\$84,892	\$922,443	\$6,981,078	\$0
2026	\$606,472	\$275,215	\$591,111	\$72,793	\$183,224	\$115,550	\$65,032	\$26,429	\$263,297	\$2,199,123	\$0
2027	\$1,037,327	\$473,566	\$974,043	\$123,500	\$321,586	\$202,645	\$103,849	\$44,684	\$451,043	\$3,732,241	\$0
2028	\$673,642	\$293,890	\$620,537	\$80,808	\$203,498	\$128,314	\$68,685	\$27,995	\$287,737	\$2,385,105	\$0
2029	\$696,711	\$313,934	\$620,526	\$83,588	\$210,516	\$132,733	\$69,408	\$28,298	\$295,483	\$2,451,295	\$0
2030	\$720,472	\$300,183	\$620,591	\$86,453	\$217,750	\$137,288	\$70,131	\$28,600	\$303,409	\$2,484,878	\$0
2031	\$4,372,218	\$1,822,024	\$3,725,522	\$516,499	\$1,308,250	\$823,720	\$391,216	\$168,668	\$1,771,134	\$14,899,251	\$0
2032	\$772,962	\$310,817	\$633,634	\$92,738	\$233,642	\$147,293	\$72,613	\$29,664	\$321,964	\$2,615,328	\$0
2033	\$799,580	\$315,440	\$640,087	\$95,325	\$240,190	\$151,415	\$73,717	\$30,140	\$329,731	\$2,675,627	\$0
2034	\$817,203	\$319,724	\$646,833	\$98,025	\$247,018	\$155,714	\$74,862	\$30,634	\$337,812	\$2,727,826	\$0
2035	\$838,902	\$322,855	\$652,452	\$100,622	\$253,588	\$159,850	\$75,898	\$31,080	\$345,488	\$2,780,735	\$0
2036	\$859,646	\$325,090	\$656,932	\$103,108	\$259,876	\$163,809	\$76,821	\$31,477	\$352,734	\$2,829,494	\$0
2037	\$881,089	\$327,393	\$661,550	\$105,679	\$266,379	\$167,903	\$77,767	\$31,884	\$360,201	\$2,879,845	\$0
2038	\$903,256	\$329,765	\$800,226	\$130,056	\$273,104	\$172,137	\$78,736	\$32,302	\$367,899	\$3,087,482	\$0
2039	\$926,175	\$332,207	\$671,202	\$111,086	\$280,059	\$176,515	\$79,730	\$32,730	\$375,834	\$2,985,539	\$0
2040	\$1,099,136	\$387,163	\$781,601	\$131,569	\$331,984	\$209,201	\$92,392	\$38,248	\$442,198	\$3,513,492	\$0
2041	\$974,376	\$337,305	\$681,423	\$116,871	\$302,488	\$190,634	\$81,793	\$34,494	\$402,554	\$3,121,939	\$0
2042	\$2,193,549	\$747,048	\$1,504,610	\$261,076	\$660,358	\$415,902	\$174,213	\$73,933	\$864,213	\$6,894,901	\$0
2043	\$1,032,485	\$346,243	\$699,361	\$123,828	\$312,301	\$196,813	\$84,660	\$34,858	\$412,931	\$3,243,481	\$0
2044	\$1,058,890	\$349,454	\$705,801	\$126,997	\$320,319	\$201,860	\$85,830	\$35,363	\$422,048	\$3,306,562	\$0
2045	\$1,086,219	\$352,743	\$712,398	\$130,278	\$328,620	\$207,086	\$87,030	\$35,880	\$431,456	\$3,371,711	\$0
2046	\$1,126,048	\$359,795	\$726,555	\$135,041	\$340,681	\$214,678	\$89,105	\$36,780	\$445,592	\$3,474,276	\$0
2047	\$1,143,791	\$359,558	\$726,069	\$137,192	\$346,117	\$218,101	\$89,520	\$36,955	\$451,186	\$3,508,489	\$0
2048	\$1,174,106	\$363,086	\$733,146	\$140,835	\$355,335	\$223,904	\$90,811	\$37,513	\$461,527	\$3,580,263	\$0
2049	\$2,257,175	\$673,894	\$1,382,530	\$269,242	\$668,649	\$421,125	\$166,797	\$69,391	\$856,691	\$6,765,495	\$0
2050	\$1,237,982	\$370,387	\$747,792	\$148,514	\$374,769	\$236,139	\$93,491	\$38,670	\$483,217	\$3,730,961	\$0

TABLE 17.5

ANNUAL WATER PURCHASE AND IMPROVEMENT SUMMARY

Year	Raw Water Purchase Wford 1000 gal	Raw Water Purchase SEPC 1000 gal	Intake Capacity Upgrade MGD	Raw Water Pumping Upgrade gpm	Treatment Plant Upgrade MGD	Storage Upgrade gal	Pumping Upgrade gpm	Pipe 1 Upgrade (in. dia.)	Pipe 2 Upgrade (in. dia.)	Pipe 3 Upgrade (in. dia.)	Pipe 4 Upgrade (in. dia.)	Pipe 5 Upgrade (in. dia.)	Pipe 6 Upgrade (in. dia.)	Pipe 7 Upgrade (in. dia.)	Pipe 8 Upgrade (in. dia.)	Pipe 9 Upgrade (in. dia.)	Pipe 10 Upgrade (in. dia.)	Pipe 11 Upgrade (in. dia.)	Pipe 12 Upgrade (in. dia.)	Pipe 13 Upgrade (in. dia.)	Pipe 14 Upgrade (in. dia.)	Pipe 15 Upgrade (in. dia.)	Pipe 16 Upgrade (in. dia.)	Pipe 17 Upgrade (in. dia.)	Pipe 18 Upgrade (in. dia.)		
1998																											
1999																											
2000																											
2001																											
2002																											
2003																											
2004																											
2005		438,590	12	10,000	2	2,500,000	5,000	16	10	10	10	10	6	6	6	10	10	6									
2006		457,993																									
2007		478,384																									
2008		489,821																									
2009		522,364																									
2010		546,080																									
2011		571,037			4	2,500,000																					
2012		597,310																									
2013		624,977																									
2014		654,123																									
2015		683,727						16																			
2016		902,313																									
2017		842,879																									
2018		985,543				2,500,000																					
2019		1,030,427																									
2020		1,147,110								16																	
2021		1,197,638			4						6																
2022		1,250,817																									
2023		1,306,808																									
2024		1,365,775																									
2025		1,612,427				2,500,000	5,000																				
2026		1,683,077																									
2027		1,757,432																									
2028		1,835,715																									
2029		1,876,380																									
2030		1,917,599																									
2031		1,860,171				2,500,000																					
2032		2,004,143																									
2033		2,049,560																									
2034		2,096,471																									
2035		2,139,894																									
2036		2,179,911																									
2037		2,221,234																									
2038		2,263,909																									
2039		2,307,978																									
2040		2,353,489																									
2041		2,400,488	12																								
2042		2,449,027																									
2043		2,498,166				2,500,000																					
2044		2,550,927																									
2045		2,604,395																									
2046		2,659,617																									
2047		2,716,650																									
2048		2,775,556																									
2049		2,836,396																									
2050		2,898,235																									

TABLE 17.6



LAKE WEATHERFORD

WEATHERFORD

HUDSON OAKS

WILLOW PARK

FORT WORTH NORTH ETJ

FORT WORTH

ANNETTA NORTH

ANNETTA

ALEDO

ANNETTA SOUTH

FROM LAKE BENBROOK

UNINCORPORATED PARKER COUNTY

FORT WORTH SOUTH ETJ

NON-MUNICIPAL UNINCORPORATED SYSTEM



APPROX. 1"=10,000'

LEGEND

- EXISTING CITY LIMITS
- PCUD #1 STUDY BOUNDARY
- LIMITS OF PROPOSED WATER LINES
- ⊕ PROPOSED WATER TREATMENT PLANT
- 12 LINE NUMBER

MAP 17.1

PIPE NUMBERING

RECOMMENDATIONS

SUMMARY OF OPTIONS

The following tables are a summary of the of the issues and options confronted in this study.

TABLE 18.1 - CONSIDERATIONS FOR CONTINUED USE OF WELLS			
SOURCE	PROS	CONS	RECOMMENDATION
Continued Use of Wells	Cheaper to construct than surface water facilities Currently requires minimal treatment Maintains complete separation of city systems	Requires increasing amounts of land Subject to reduced production with increasing demand Vulnerable to contamination	Trend away from well dependence as population densifies

TABLE 18.2 - CONSIDERATIONS FOR PURCHASING TREATED WATER FROM AN EXISTING SOURCE

SOURCE	PROS	CONS	RECOMMENDATION
City of Weatherford	Existing local treatment plant and Lake Previous dealings with area entities Parker County solution Abuts study area	Existing lake supply currently inadequate for Weatherford Existing treatment plant also inadequate Weatherford already acquiring outside raw water supply from TRWD Contract with TRWD prohibits resale of water purchased from TRWD	Currently prohibited by TRWD contract unless such contract can be modified.
City of Fort Worth	Historically, FW has positioned itself to supply water to the area Part of large existing system Wholesales to 27 other cities Abuts study area	FW claims to be currently strained to supply northern areas FW has expressed a disinterest in serving area Considers SE Parker County in Weatherford's service area	It appears that only a political solution will allow FW to service the area
Tarrant Regional Water District	Already has rights to raw water Ample raw water supply with additions in progress Has organizational and financial structure in place	Does not currently treat water Prohibited from supplying treated water as part of existing system by Settlement Agreement	Would have to create as separate enterprise apart from the "system"
Walnut Creek Special Utility District	Already supplies treated water to a large area of northern Parker County	Purchases raw water from TRWD Acquires water from Lake Bridgeport, a much less dependable lake on the system Current facilities inadequate to serve study area. Would require treated water transmission line approximately 20 miles long through undeveloped areas	No real benefit realized from being a part of this system. Water should be acquired from Lake Benbrook and treated locally to serve SE Parker County

TABLE 18.3 - CONSIDERATIONS FOR RAW WATER SUPPLIES

SOURCE	PROS	CONS	RECOMMENDATION
City of Weatherford (from Lake Weatherford)	Lake Weatherford just upstream of study area	Lake Weatherford inadequate to meet the needs of the City of Weatherford Weatherford prohibited from reselling outside of Weatherford service area water purchased from TRWD	Not a sufficient source of supply
Tarrant Regional Water District (from Lake Benbrook)	Has water rights in most of area lakes Has water rights in Lake Benbrook, the closest lake Uses Lake Benbrook as a constant level reservoir to receive "East Texas" water Willing to take on additional customers	Study area entities must pay for line and facilities to draw and transport water from the lake Settlement agreement hampers TRWD from adding to the "system"	RECOMMENDED ALTERNATIVE Obtain raw water from TRWD
Tarrant Regional Water District (Delivered to Treatment Plant)	Could allow cost of line to be borne by TRWD system. Would keep customers out of dealing with raw water prior to treatment	Prohibited under Settlement Agreement	Not Allowed without changing current contracts

TREATMENT AND DISTRIBUTION OF RAW WATER

TABLE 18.4 - CONSIDERATIONS FOR RAW WATER TREATMENT			
TREATMENT ENTITY	PROS	CONS	RECOMMENDATION
Each City/Utility provides own plant	Maintain an additional level of independence for each entity	Increases liability and responsibility of each city/utility None of the existing water utilities currently own/operate a treatment plant Multiple small plants are more expensive than a single large plant Could increase piping lengths depending on chosen locations	Expensive and Impractical
City of Fort Worth	Part of large existing system Abuts study area Much of potential service area in FW ETJ Fort Worth's Master Thoroughfare Plan includes a freeway (limited access) loop through eastern part of study area It was efforts by FW that currently hinder TRWD and Weatherford from supplying area with treated water	FW claims to be currently strained to supply northern areas Considers SE Parker County in Weatherford's service area No current FW treatment facilities in area Fort Worth not currently interested in supplying water to area	Make one final overture to Fort Worth prior to, or in conjunction with, pursuing other recommendations. If no quick positive response, go to other options
City of Weatherford	Already has new plant adjacent to study area Could serve both Willow Park and Hudson Oaks with minimal length of line	Weatherford already needing to expand plant to full capacity for own use Weatherford prohibited from resale of water purchased from TRWD	Not a sufficient source of supply without modification of contract with TRWD
Another Regional Entity	Consolidates ownership, permitting and operations Allows for one plant with economies of scale Allows for control by the existing study area entities by membership into the district	No such entity currently encompassing the study area Legislation for the creation of a new district must wait until 2001.	Incorporate study area into a regional district (either existing or to be created)
Private Enterprise	Relieves cities of all permitting and operations burden for plant and lines	Increase cost to wholesale and retail buyers since profit would have to be added to operations costs. Reduces control of system by water utilities in the study area and leaves them vulnerable to future changes and cost increases	Probably should not be pursued

TABLE 18.5 - CONSIDERATIONS FOR WATER DISTRIBUTION

DISTRIBUTION ENTITY	PROS	CONS	RECOMMENDATION
Each city responsible for construction of lines from regional plant	Allows some alternate financing for lines	Could result in redundant lines at added expense Could result in redundant metering at added expense	Include ownership and cost of lines into the same regional entity that owns/operates the plant
Regional Entity responsible for construction of lines from regional plant	Minimizes line costs Facilitates metering		RECOMMENDED ALTERNATIVE

TYPES OF REGIONAL ENTITIES

TABLE 18.6 - DISTRICT TYPES

District Type	Uses and Purpose	Created By	Board Members	Levy Taxes	Right to Own Operate & Maintain Facility	Debt Issuance	Debt Repayment	Eminent Domain
Municipal Utility District	Reclamation Drainage Irrigation Preservation	TNRCC & Election of Members	Elected	Yes	Yes	Yes	Taxes & Service Fees	Yes
Special Utility District	Water Utility	Resolution of Water Supply Corp. and TNRCC Approval	Elected	No	Yes	Yes	Service Fees	Yes
General Law District	Water & Wastewater	TNRCC	Elected	Yes	Yes	Yes	Taxes & Service Fees	Yes
Special Law District	Water & Wastewater	Legislative Act	Elected or Appointed	Yes or No	Yes	Yes	Taxes and/or Service Fees	Yes
Public Utility Agency	Wastewater	Ordinance of Participating Entities	Appointed	No	Yes	Yes	Service Fees	Yes
Water Improvement District	Irrigation Drainage Water Supply	Consumers Court & Election	Elected	Yes	Yes	Yes	Taxes & Service Fees	Yes

**TABLE 18.7 - CONSIDERATIONS FOR REGIONAL OWNERSHIP
OF TREATMENT FACILITIES**

REGIONAL ENTITY	PROS	CONS	RECOMMENDATION
Tarrant Regional Water District	Already an active, successful regional entity dealing in raw water and flood control	Prohibited by contract from performing adequate role in study area as part of existing system	Pursue having contracts modified to allow TRWD expansion into upper reaches of water shed for construction of raw water lines and/or water treatment
Parker County Utility District No. 1	Already created Willing to serve this role Signs of approval from some of study area entities for this option Would provide a stronger, expanded role as a regional entity Signals that this option would be preferred by state agencies and TRWD to solidify role as regional entity	Boundaries do not currently include study area New district without a proven track record of operation Primary focus is wastewater for Walnut Creek basin of northeastern Parker County Not currently operating any water utilities	Pursue expanding PCUD #1's district boundaries to include the study area in order to allow representation of the study area entities on the PCUD #1 Board
Establish new Regional District	Could be more responsive to study area	Costly to create (\$80,000+) Best created by state legislature (time consuming and sensitive)	If this option is pursued, legislation cannot be enacted on until 2001

RECOMMENDATION SUMMARY

After reviewing the options for providing water to the service area, it appears that the best current option would be:

- 1.) REGIONAL EFFORT: Establish a joint organization to represent all water utilities in the study area. A regional district is best suited for this purpose. Since it does not appear to be currently feasible to have Tarrant Regional Water District assume this function due to existing contractual relationships, the district would need to be another district which could expand into the area, or a new district created for the area. Since creating a district is a lengthy and expensive process, it would appear that expansion of the existing Parker County Utility District No. 1 to incorporate the study area would be the most viable approach. However, the method for such expansion for this recent district has not been exercised and several legal issues may need to be resolved prior to this expansion. The regional district approach is a well accepted method in Texas by which economy of scale is reached to reduce costs and by which member entities are represented in the governance of the district.
- 2.) PURCHASE RAW WATER FROM TRWD: Have the District contract directly with Tarrant Regional Water District for raw water. The most practical approach would be to extract this water from Lake Benbrook, the closest and most reliable source.
- 3.) TRANSPORT RAW WATER: Since the City of Weatherford is already contracting with TRWD for raw water from Lake Benbrook and is currently constructing facilities to transport this water to their plant, it would save time and money (for both parties) to have the District participate in the construction of this line and facilities from Lake Benbrook to the study area treatment plant.
- 4.) TREAT RAW WATER: The District would then need to construct a single water treatment plant. Since the source of water and the final destinations will not vary, it will be more expensive to construct and operate multiple plants. The preferred location for a single plant would be at the location where the main transmission line starts branching into feeder lines to each water utility. A higher elevation which would allow for gravity feed of treated water, if necessary, to customer utilities is preferred. The area northeast of Aledo would meet this general criteria.
- 5.) DISTRIBUTE TREATED WATER: The district would then need to transport the treated water to each water utility. This would be a wholesale arrangement with each water utility continuing to provide retail distribution.

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APPENDICES

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APPENDIX A - QUESTIONNAIRE RESPONSES

Population and Water Use
Well Data for Cities
Well Data for Private Systems
Water Storage Data
Water Distribution
Billing Information

Initial Study Questionnaire Responses - Population and Water Use

City	Year	Reported Population	Residential		Commercial		Total Production	Average Monthly System Loss	Comments	Daily Use Per Res. Customer	Daily Use Per Comm. Customer
			Customers	Daily Use (gal)	Customers	Daily Use (gal)					
Hudson Oaks	1970	300									
Hudson Oaks	1980	711	424	166000	15	12000	5950	610		392	800
Hudson Oaks	1990	1150	608	232000	20	14000	8700	1320		382	700
Hudson Oaks	1996	1200	607	295000	22	17000	11266	1756		486	773
Hudson Oaks	1997	1200	621	258000	22	15000	9374	1071		415	682
Hudson Oaks	1998	1250	621	137000	22	15000	5385	903	Jan/Feb Only	221	682
Hudson Oaks	1999	1415									
Hudson Oaks	2000	1581									
Hudson Oaks	2005	2410									
Hudson Oaks	2010	3235									
Hudson Oaks	2015	4060									
Hudson Oaks	2020	4885									
Hudson Oaks	2030	6535									
Aledo	1995	1300	411		23						
Aledo	1996	1350	451		23						
Aledo	1997	1400	474		24						
Aledo	1998	1500	500		26	7339				0	282
Willow Park	1995	2500									
Willow Park	1996	3000									
Willow Park	1997	3000									
Deer Creek	1997	467	187	88808	0	0	2701266	10%			
Deer Creek	1998				0	0		5% to 7%			
Highland	1970	150	50	19000	0	0	570	0.5			
Highland	1980	300	100	38000	0	0	1140	1		380	
Highland	1990	360	120	45600	0	0	1368	1.3		380	
Highland	1995	366	122	42700	0	0	1281	1.2		350	
Highland	1996	390	129	51501	0	0	1545	1.5		399	
Highland	1997	414	138	67917	0	0	2037	2		492	
Highland	1998	438	146	65700	0	0	1971	1.9		450	
Highland	1999	462	154	69300	0	0	2079	2		450	
Highland	2000	480	160	72000	0	0	2160	2.1		450	
Dyegard	1996	75	25	25000	0	0	768			1000	
Dyegard	1997	171	57	29000	0	0	885			509	
Dyegard	1998	270	90	46000	0	0	1395			511	
Dyegard	1999	540	180	93000	0	0	2791			517	
Dyegard	2000	810	270	139000	0	0	4187			515	
Dyegard	2005	1691	357	184000	0	0	5536			515	
Dyegard	2010										
Dyegard	2015										
Dyegard	2020										
Dyegard	2030										

Initial Study Questionnaire Responses - Well Data For Cities

Owner	Well No.	Original Water System	Location	Date Drilled	Total Depth	Aquifer	Max Flow	Avg. Flow (gpd)	Back Up Power	Chlorine	Daily CL Used	150' Well Esmt.	Reported Excess			Contamination		
													TNRCC Violations	Down	Draw	Chem	Bio	Solid
Hudson Oaks	1	Green Oaks	Lot 1A	04/01	240	Paluxy	22		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	2	Green Oaks	Lot 1A	06/03	200	Paluxy	18		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	3	Green Oaks	Lot 34	05/15	309	Paluxy	55		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	4	Diamond Oaks	Lot 32	04/01	255	Paluxy	30		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	5	Diamond Oaks	Lot 6C	08/04	196	Paluxy	55		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	6	Diamond Oaks	Saddlebrook	08/01	225	Paluxy	9		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	7	Diamond Oaks	Saddlebrook	06/01	220	Paluxy	17		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	8	Diamond Oaks	Saddlebrook	08/02	204	Paluxy	80		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	9	Diamond Oaks	Lot 5D	08/26	260	Paluxy	24		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	10	Diamond Oaks	Lot 5D	08/01	230	Paluxy	70		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	11	Diamond Oaks	G.O. Lot 6B	04/25	275	Paluxy	47		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	12	Hidden Oaks	Block 2, Lot 5	11/30	208	Paluxy	55		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	13	Hidden Oaks	Well 2	08/08	220	Paluxy	20		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	14	Hudson Heights	Block 5 Lot 10	1972	240	Paluxy	22		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	15	Hudson Heights	Block 5 Lot 10	1977	210	Paluxy	18		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	16	Lakeshore	Block 9 Lot 8	05/03	231	Paluxy	40		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	17	Lakeshore	Block 9 Lot 8	12/07	130	Paluxy	12		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	18	Lakeshore	Block 9 Lot 12	06/21	240	Paluxy	56		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	19	Lakeshore	Block 1 Lot 1	01/20	217	Paluxy	16		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	20	Lakeshore	Block 5 Lot 7	01/28	200	Paluxy	55		No	CL2		Yes	No	No	No	No	No	No
Hudson Oaks	21	Lakeshore	Block 1 Lot 5	08/08	215	Paluxy	65		No	CL2		Yes	No	No	No	No	No	No
Aledo	1		Front Street		204	Paluxy	56	42000	No	CL Gas	1 lb	Yes	No	No	No	No	No	No
Aledo	2		Queen Street		306	Paluxy	38	50000	No	CL Gas	1 lb	Yes	No	No	No	No	No	No
Aledo	3		1187-S			Paluxy	12	16000	No	10% Bleach	1 inch	Yes	No	No	No	No	No	No
Aledo	4		Rolling Hills		235	Paluxy	58	81000	No	CL Gas	1 lb	Yes	No	No	No	No	No	No
Aledo	5		1187-S		600	Paluxy	28	38000	No	CL Gas	1 lb	Yes	No	No	No	No	No	No
Aledo	6		SW FM 5			Trinity	115	120000	No	CL Gas	4 lb	Yes	No	No	No	No	No	No
Willow Park	1		East Lake			Paluxy	52	64000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	2		East Lake			Paluxy	26	26000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	3		East Lake			Paluxy	54	65000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	4		East Lake			Paluxy	35	38000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	5		Indian Camp			Paluxy	40	52000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	6		Ridge			Paluxy	70	89000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	7		White			Paluxy	50	60000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	8		Ranch House			Paluxy	13	13000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	9		Ranch House			Paluxy	93	127000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	10		Surry			Paluxy	56	69000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	11		Squaw Peak			Paluxy	37	49000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	12	Willow Wood N.	Circle Drive			Paluxy	24	27000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	13	Willow Wood S.	Royal View			Paluxy	21	25000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	14	Willow Springs	W-5 Plant	1983		Paluxy	12	13000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	15	Willow Springs S.	W-5 Plant	1983		Paluxy	41	52000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	16	Willow Springs S.	W-5 Plant			Paluxy	25	26000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	17	Willow Springs S.	Indian Camp			Trinity	140	173000	No	10% Bleach		Yes	No	No	No	No	No	No
Willow Park	18	Willow Springs	Circle Lane	1983		Paluxy	67	80000	No	10% Bleach		Yes	No	No	No	No	No	No

Initial Study Questionnaire Responses - Well Data For Private Systems

Owner	Well No.	Original Water System	Location	Date Drilled	Total Depth (ft)	Aquifer	Max Flow (gpm)	Avg. Flow (gpd)	Back Up Power	Chlorine	Daily CL Used	150' Well Esmt.	Reported Excess TNRCC Violations	Contamination		
													Down	Bio	Solid	Other
Deer Creek	1		Ridge Crest	1986	252	Paluxy	105	95 gpm	No	Gas		Yes	No	No	No	No
Deer Creek	2		Ridge Crest	1986	561	Trinity	120	105 gpm	No	Gas		Yes	No	No	No	No
Deer Creek	3		Quail Run	1990	480	Trinity	165	130 gpm	No	Gas		Yes	No	No	No	No
Highland	1		Yucca	06/15	170	Paluxy	60	9.42	No	CL2		No	No	No	No	No
Highland	2		Yucca	12/28	180	Paluxy	50	3.42	No	CL2		No	No	No	No	No
Highland	3		Oak Park	03/13	135	Paluxy	65	16.68	No	CL2		No	No	No	No	No
Dyegard	1		Devon	02/18	248	Paluxy	70	57600	No	CL2		No	No	No	No	No
Dyegard	2		Bankhead	08/15	260	Paluxy	60	57600	No	CL2		No	No	No	No	No

Initial Study Questionnaire Responses - Water Storage Data

City	System	Tank No.	Location	Capacity (gallons)	Material	Date Built	Type	Water Source	Level	15% Tank Drop?	When did it Drop?
Hudson Oaks	Lakeshore	1	3403 Bluebonnet Circle (Plant #1)	21000	Galvanized	05/03	Ground	Wells 1-3	Submersible Probes	No	
Hudson Oaks	Lakeshore	2	3403 Bluebonnet Circle (Plant #1)	21000	Galvanized	12/07	Ground	Wells 1-3	Submersible Probes	No	
Hudson Oaks	Lakeshore	3	3403 Bluebonnet Circle (Plant #1)	126000	Galvanized	03/15	Ground	Wells 1-3	Submersible Probes	No	
Hudson Oaks	Lakeshore	4	206 Lakeshore Drive (Plant #2)	40000	Galvanized	01/20	Ground	Wells 4-7	Submersible Probes	No	
Hudson Oaks	Lakeshore	5	206 Lakeshore Drive (Plant #2)	40000	Galvanized	01/20	Ground	Wells 4-7	Submersible Probes	No	
Hudson Oaks	Hudson Heights	1	200 Lakeshore Drive East	12000	Painted Steel	1972	Ground	Wells 1-2	Submersible Probes	No	
Hudson Oaks	Hidden Oaks	1	Block 3, Lot 4	42000	Galvanized	04/01	Ground	Wells 1-2	Submersible Probes	No	
Hudson Oaks	Hidden Oaks	2	Hidden Oaks Drive	12500	Galvanized	11/30	Ground	Wells 1-2	Submersible Probes	No	
Hudson Oaks	Diamond Oaks	1	Doris Drive, Lot 32 (North)	126000	Galvanized	04/01	Ground	Wells 1-5,8	Submersible Probes	No	
Hudson Oaks	Diamond Oaks	2	Doris Drive, Lot 32 (South)	168000	Galvanized	05/01	Ground	Wells 1-5,8	Submersible Probes	No	
Hudson Oaks	Diamond Oaks	3	Water Plant #1	12500	Galvanized	04/15	Ground	Wells 6-7	Submersible Probe	No	
Hudson Oaks	Diamond Oaks	4	Lot 5D, Diamond Oaks (Water Plant #2)	42000	Galvanized	04/15	Ground	Wells 6-7	Submersible Probes	No	
Hudson Oaks	Green Oaks	1	Block 2, Lot 1-A	126000	Galvanized	3/98	Ground	Wells 1-2	Submersible Probes	No	
Hudson Oaks	Green Oaks	2	Green Oaks Trail	12000	Galvanized	04/01	Ground	Wells 1-2	Submersible Probes	No	
Aledo		1	Front Street	65000	Galvanized	01/16	Ground	Well 1	Probe	Yes	Summer 93
Aledo		2	Queen Street	176000	Galvanized		Ground	Wells 1-6	Probe	Yes	Summer 93
Aledo		3	Queen Street	176000	Galvanized		Ground	Wells 1-6	Probe	Yes	Summer 93
Aledo		4	Rolling Hills	40000	Galvanized		Ground	Well 4	Probe	Yes	Summer 93
Aledo		5	1187-S	40000	Galvanized		Ground	Well 5	Probe	Yes	Summer 93
Aledo		6	500 FM 5	64200	Galvanized	1996	Ground	Well 6	Probe	No	
Willow Park		1	Indian Camp	500000	Metal	1990	Ground	1-5,14,15	Probe	Yes	Summer 93,94
Willow Park		2	Indian Camp	300000	Metal	1993	Ground	1-5,14,15	Probe	Yes	Summer 93,94
Willow Park		3	Indian Camp	75000	Metal	1963	Elevated N.	System	Probe	Yes	Summer 93,94
Willow Park		4	I-20 Service Road	75000	Metal		Elevated S.	System	Pressure Valve	Yes	Summer 93,94
Willow Park		5	Willow Wood	25000	Metal Bolted	1963	Ground	12,13	Probe	Yes	Summer 93,94
Willow Park		6	Willow Springs	25000	Metal		Ground	14,15	Probe	No	
Willow Park		7	Willow Springs	25000	Metal		Ground	14,15	Probe	No	
Willow Park		8	Willow Springs Oaks	25000	Galvanized		Ground	18	Probe	No	
Willow Park		9	Willow Springs Oaks	25000	Galvanized		Ground	18	Probe	No	
Deer Creek		1	Ridge Crest	1000 BBL	Metal	1986	Ground	Well 1-2	Probe	No	
Deer Creek		2	Ridge Crest	1000 BBL	Metal	1986	Ground	Well 1-2	Probe	No	
Deer Creek		3	Quail Run	1000 BBL	Metal	1990	Ground	Well 3	Probe	No	
Deer Creek		4	Quail Run	1000 BBL	Metal	1990	Ground	Well 3	Probe	No	
Highland		1	Water Plant 1	42000	Galv. Bolted	1968	Pneumatic	Wells 1-2	Electrodes	No	
Highland		2	Water Plant 2	22000	Galv. Bolted	1980	Pneumatic	Well 3	Electrodes	No	
Highland		3	Water Plant 2	22000	Galv. Bolted	1995	Pneumatic	Well 3	Electrodes	No	
Highland		4	Water Plant 2	22000	Galv. Bolted	1995	Pneumatic	Well 3	Electrodes	No	
Dyegard		1	Devon	42000	Galv. Bolted	1995	Pneumatic	Wells	Electrodes	No	
Dyegard		2	Bankhead	126000	Galv. Bolted	1997	Pneumatic	Wells	Electrodes	No	

Initial Study Questionnaire Responses - Water Distribution

Entity	System	All Current Water Sources Linked?	Looped?	No. of Pressure Planes	Elevation Ranges (By Pressure Plane)				Normal Pressure	Maximum Pressure	Minimum Pressure	No. of Fire Hydrants	Key Rate
					1	2	3	4					
Hudson Oaks	Green Oaks	Yes	Yes	1	N/A	N/A	N/A	N/A	55	60	50	1	
Hudson Oaks	Diamond Oaks	Yes	Yes	1	N/A	N/A	N/A	N/A	55	60	50	24	
Hudson Oaks	Hidden Oaks	Yes	No	1	N/A	N/A	N/A	N/A	50	55	45	5	
Hudson Oaks	Hudson Heights	Yes	Yes	1	N/A	N/A	N/A	N/A	55	60	50	0	
Hudson Oaks	Lakeshore	Yes	Yes	1	N/A	N/A	N/A	N/A	55	60	50	16	
Aledo		Yes	No	1						60	40	150	
Willow Park		No	No	1						35	90	Yes	
Deer Creek		Yes	Yes					65	95	48	Yes		
Highland		Yes	Yes	2	50 ft	50 ft.		55	60	40	11	None	
Dyegard		Yes	Yes	1	50 ft			55	60	40	22	None	

Initial Study Questionnaire Responses - Billing Information

Entity	System	Residential		Commercial		Tap Fees						
		Base Rate	Additional Cost/1000	Base Rate	Additional Cost/1000	3/4"	1"	1.25-2"	2.25-3"	4"	6"	Over 6"
Hudson Oaks	Green Oaks	\$20.00	\$1.80	\$20.00	\$1.80	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Hudson Oaks	Diamond Oaks	\$20.00	\$1.80	\$20.00	\$1.80	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Hudson Oaks		\$20.00	\$1.80	\$20.00	\$1.80	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Hudson Oaks	Hudson Heights	\$20.00	\$1.80	\$20.00	\$1.80	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Hudson Oaks	Lakeshore	\$20.00	\$1.80	\$20.00	\$1.80	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Aledo		\$111.00	\$2.75 to 660 up to \$3.15 to 1800	\$11.00	\$2.75 to 660, \$3.15 to 1800, \$3.55 thereafter	\$200	\$200	\$200	\$200	\$200	\$200	\$200
Willow Park	In City	\$22.86 to \$800 depending on tap size	\$1.85	Same	Same	\$800	\$850	\$1,660	\$1,660	\$3,880	\$5,540	
Willow Park	Outside City	\$34.29 to \$587.94 depending on tap size	\$2.78	Same	Same	\$800	\$850	\$1,660	\$1,660	\$3,880	\$5,540	
Deer Creek		\$18.00	\$1.50			\$350						
Highland		\$20.00	\$1.70	\$26.00	\$1.95	\$400	\$400 + Cost	\$400 + Cost	\$400 + Cost	\$400 + Cost	\$400 + Cost	\$400 + Cost
Dyegard		\$20.00	\$2.50	\$20.00	\$2.50	\$500	\$500 + Cost	\$500 + Cost	\$500 + Cost	\$500 + Cost	\$500 + Cost	\$500 + Cost

APPENDIX B - RESPONSE LETTERS FROM OTHER ENTITIES

Weatherford
Fort Worth
Tarrant Regional Water District



CITY OF WEATHERFORD

July 6, 1998

Mr. Kelly Carta, P.E.
Teague Nall and Perkins
915 Florence Street
Fort Worth, TX 76102

Re: Your Letter of June 18, 1998

Dear Kelly:

Thank you for your letter of June 18. Weatherford, as you know, has been overdrafting Lake Weatherford for several years. We are also prohibited by contract from selling treated Benbrook or East Texas water outside our city limits.

We would be willing to work cooperatively through TRWD in Fort Worth in any regional approach to this problem.

Sincerely,

James R. Dickason
Director of Utilities

JRD/kb

\\FILES\SHAR\kellib\K Carta, 7-6-98.doc

cc: Weatherford Municipal Utility Board
Jim Oliver, TRWD



July 16, 1998

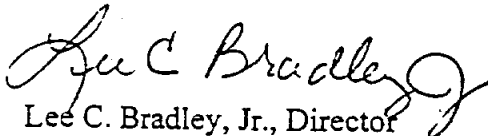
Kelly Dillard
Teague Nall and Perkins
915 Florence Street
Fort Worth, Texas 76102

Dear Kelly:

This letter is in reference to your inquiry regarding the Fort Worth Water Department's interest in supplying water to the East Parker County area. Fort Worth has limited water capacity in West Fort Worth and the service area planning has generally been limited to the area within the City Limits of Fort Worth and the Fort Worth ETJ.

It appears that East Parker County is in the vicinity of the Weatherford area. Weatherford not only has a lake near this region but also has the right to take water from Benbrook. This may be a more reasonable alternative than using Fort Worth water. At this time Fort Worth does not advocate providing water to this area.

Sincerely,


Lee C. Bradley, Jr., Director
Fort Worth Water Department

WATER DEPARTMENT
ADMINISTRATION DIVISION

THE CITY OF FORT WORTH ★ 1000 THROCKMORTON STREET ★ FORT WORTH, TEXAS 76102
(817) 871-8220 ★ FAX (817) 871-8195

Handwritten initials and date: KD 7/20/98

TARRANT REGIONAL WATER DISTRICT

800 East North Side Drive
Fort Worth, Texas 76102-1097

BOARD OF DIRECTORS

George W. Shannon, President
Victor W. Henderson, Vice President
Charles B. Campbell Jr., Secretary
Hal S. Sparks III
Brian C. Newby



P.O. Box 4508
Fort Worth, Texas 76164-0508
Telephone 817-335-2491
FAX 817-877-5137

James M. Oliver
General Manager

July 6, 1998

Mr. J. Kelly Carta, P.E.
Teague Nall and Perkins, Inc.
915 Florence Street
Fort Worth, Texas 76102

Dear Mr. Carta:

We are in receipt of your letter dated June 18, 1998 concerning water supply issues associated with the Southeastern Parker County Water Study.

The Tarrant Regional Water District has included Parker County in its regional water supply planning. Current plans reflect growing raw water service by the District in Parker County through the year 2050.

The District has a long-term contract with the City of Weatherford to sell raw water out of Benbrook Reservoir. Weatherford is not currently taking water from Benbrook, as their pipeline is not currently scheduled for completion until early in the next decade.

The District is very interested in the conduct of your current study in Southeastern Parker County. However, any recommendations as to institutional arrangements involving the District to provide services beyond that of a raw water supply available at Benbrook Reservoir would have to be initiated by the beneficiaries of such plans.

We very much look forward to working with you on this important study project.

Sincerely,



Wayne P. Owen, Jr.
Planning & Development Manager

cc: J. Oliver
A. Thomas

APPENDIX C - SUMMARY OF TRWD SETTLEMENT AGREEMENT

**Summary of
Tarrant County Regional Water Supply Facilities Amendatory Contract
Exhibit A to Settlement Agreement**

**Dated September 1, 1982 between
the District (TCWCID#1, now Tarrant Regional Water District)
And the Initial Contracting Parties (Fort Worth, Mansfield, TRA, and Arlington).**

The District is governed by :

The Texas Constitution, Article 16, Section 59 (Creation and function)
Texas Water Code, Chapter 51 (general governing laws)
1957 55th Texas Legislature, Chapter 268, Regular Session (ability to issue bonds)

WITNESSETH

WHEREAS:

1. Fort Worth, Arlington and Mansfield are Home Rule cities.
2. Trinity River Authority (TRA) is a state authorized conservation and reclamation district as organized under 1955 54th Texas Legislature, Chapter 568, Regular Session and the Texas Constitution, Article 16, Section 59.
3. The Interlocal Cooperation Act (Vernon's Article 4413(32c)) allows the District and other political subdivisions to enter into contract.
4. The District's Existing System consists of raw water supply facilities at Eagle Mountain Lake, Lake Bridgeport, West Fork of the Trinity River and Cedar Creek Lake.
5. The District has issued bonds for the construction of Cedar Creek Lake and related facilities.
\$44,205,000 - Series 1977 - dated 12/1/77
\$ 7,750,000 - Series 1979 - dated 3/1/79,
refunded and replaced by Series 1979-A (see below).
6. Current raw water supplies from the Existing System by the District to the Initial Contracting Parties are inadequate to meet needs. This new contract is required to allow District to enhance facilities to supply growing needs.
7. The cost for such enhancements will be passed on to the Initial Contracting Parties via a pro rata arrangement including rates for water.
8. The District proposes to construct "The Project" consisting of additional facilities including Richland and Chambers Creek Reservoirs, and Tehaucana Creek Reservoir, and all associated transmission facilities to supply Contracting Parties.
9. The Project is described in the "TCWCID#1 Report on Sources of Additional Water Supply", dated March 1979 by Freese and Nichols, Inc.
10. The Engineering Report includes the above report and all amendments, supplements, and change orders.
11. **The "System" refers to the Existing System with the addition of the proposed Project.**
12. The District entered into a Base Contract (Tarrant County Regional Water Supply Facilities Contract) with Fort Worth and Mansfield on August 29, 1979.
13. **In conjunction with the Base Contract, the District refunded the Series 1979 Bonds and issued replacement bonds designated \$342,750,000 - Series 1979-A Bonds - 10/1/79.**
14. The Base Contract allows the District to contract with additional parties, particularly Arlington and TRA from which contracts were anticipated.
15. TRA entered into such a contract on 12/12/79, complying with all requirements of the

- Base Contract.
16. Arlington had a prior 7/13/71 contract with the District.
 17. Arlington did not execute a new contract compliant with the Base Contract until after the specified time limit. Therefore, Fort Worth, Mansfield and TRA must approve Arlington being a bona fide Initial Contracting Party and allowing the same parity as the other three.
 18. This document modifies and amends the Base Contract, TRA Contract and Arlington Contract to achieve a parity situation between the District and the four Initial Contracting Parties.
 19. This Contract will not affect the operation of the System or rights of the Bond holders, but will oblige Arlington in its share of bond payments.
 20. This Contract essentially places Base Contract consistent rights and obligations on all four Initial Contracting Parties and does not otherwise effect the unconditional obligations of the Initial Contracting Parties with respect to the System or Bonds.

NOW THEREFORE:

1. The District shall complete the project and supply raw water to Contracting Parties.
2. **The Initial Contracting Parties agree that their prior contracts are modified to be consistent with this Contract.**

Section 1: Definitions:

Additional Contracting Party
Adjusted Annual Payment
Advisory Committee
Annual Payment
Annual Payment Period
Annual Requirement
Bond Resolution
Bonds
Contracting Parties = Initial Contracting Parties
Contracting Party
District
Engineering Report
Existing System
MGD
Operation and Maintenance Expense
Project
Series 1977 Bonds
Series 1979 Bonds
Series 1979-A Bonds
System

Section 2. Consulting Engineers; Construction of Project

- A. Freese and Nichols will do the engineering, but can be replaced by the District.
- B. The District will complete the Project in accordance with the Engineering Report by issuing Bonds.

Section 3. Quantity, Quality and Unit of Measure

- A.a. Quantity
 1. **The District shall sell and deliver water to an agreed upon Point(s) of**

Delivery with each Contracting Party.

2. **Any future Contracting Party will be responsible for paying for all facilities needed to transport water from the System to any new Points of Delivery.**
3. **All water required by each Contracting Party shall be taken at the agreed Point of Delivery.**
4. After 9/1/82, no Contracting Party shall agree to supply water outside of its legal boundaries to entities under contract after 2/28/80 without such entities complying with the water requirements of this contract.
5. The Cities of Lake Worth and Everman are deemed to have had a contract with Fort Worth prior to 2/28/80.
6. All parties are required to recognize the priority of water use.
7. Mansfield can continue to use its well water without additional payment for wells operating within the City Limits as drawn on 9/1/82.
8. Arlington can continue to use water from Lake Arlington and from wells but must pay for such as stipulated in Section 4C.
9. Fort Worth can continue to use water from Lake Benbrook, Lake Worth, and wells, but must pay for such as stipulated in Section 4C.
10. **Other than the above mentioned exclusions, all parties must utilize the District exclusively for water sources.**
11. Such exclusiveness only applies to the Tarrant Portion of TRA and includes Bedford, Euless, Grapevine, North Richland Hills, Colleyville and others which are a part of the Tarrant County Water Project.
12. Fort Worth is wholly within the District boundaries but can sell to customers outside of the District.
13. The District will use "its best efforts" to meet "reasonable demands" for raw water, so long as such water is available in the System and to provide for such demands using Bond proceeds as prudent.
14. In the event rationing is required, the Initial Contracting Parties (Fort Worth, Mansfield, Arlington and TRA) will have priority to the extent that the law will allow.
15. Should rationing be needed among the Initial Contracting Parties, each will be limited in a proportionate fashion by the District based on the demand by each entity during the year prior to rationing.

A.b.

1. Should raw water not be available from the District for a Contracting Party, the Contracting Party can secure sources other than the District after a 30 day review and approval period by the District.
2. The cost of procuring other sources shall be borne by the Contracting Party with no liability to the District
3. The Contracting Party is still required to take as much water from the District, as available, even if another source is required.
4. If during the 30 day review, the District does not agree that it can meet the needs of the Contracting Party, the matter will be turned over to an Advisory Committee, which has 60 days to make a recommendation.
5. All parties have the right to secure alternate sources in the event of a "Force Majeure".

B.a. **Other Contracts**

1. **The District has the right to contract with other parties, subject to this contract.**
2. **Such contracts shall be patterned after this one.**
3. **The District shall not contract for more water than it can normally deliver.**

- B.b.
1. The District's current contracts with other parties (see list of 31 entities) will remain in force.
 2. The District shall charge the maximum allowable rates and charges. allowable by these existing contracts.
 3. These parties will be treated as new customers when their contracts come up for renewal.
 4. The District may sell to other parties (non contracting) when such water is available. Such shall not degrade service to contracting parties.

C. **Quality**

1. **Delivered water shall be raw and untreated.**
2. **District and Contracting Parties will work to prevent pollution and contamination of water sources.**
3. The District shall mix East Texas water as practical to minimize changes in water chemical quality.

D. Unit of Measure

Water shall be measured per 1,000 gallons.

Section 4. Fiscal Provisions

A. Financing the System

1. **The District will finance improvements by issuing bonds.**
2. **The District shall own and operate the System.**

B. Annual Requirement

1. **An annual payment from all Contracting Parties will be required to pay the annual requirement..**
2. **The annual requirement shall be sufficient to pay for operations, maintenance, and bond service. As per any Bond Resolution, the annual requirement shall cover any due interest and principal, premium, buyback, reserve account, or deficiency.**

C.a. Payments for Services

1. **Each Contracting Party shall pay its share of the annual requirement to the District in monthly installments due on the 10th of each month.**

C.b.

1. The Annual Payments shall be calculated by estimating the Contracting Party's total annual water use.
2. Fort Worth will base its Annual Payment on water it sells outside the District.
3. Payment shall be based on 1000 gallon rate and premium rate for usage.
4. Water from Lake Benbrook, Lake Worth, Lake Arlington, and well in Fort Worth and Arlington shall be considered part of the system and sold accordingly.
5. Stipulated wells in Mansfield shall be excluded.
6. **The District will provide each Contracting Party with a schedule of payments.**
7. **Payment adjustments will be made for actual annual use at the end of the year.**
8. **Such adjustments shall be treated as credits or debits to the monthly payments for the next year.**
9. There are special provisions for the payments of the initial contracting parties for

five years so that payments can be made retroactive to 3/1/80.

C.c.

1. **Each Party is responsible for payment on their contracted monthly minimum amount, whether used or not.**
2. **Payment on amounts over the minimum shall be base on actual use.**
3. **Initial minimums shall be base on total expected raw water demand for the first year of each contract.**
4. **New contracts will also charge a premium (surcharge) to pay equitable costs of the existing system for completed capital expenditures.**
5. **Each Contracting Party is unconditionally responsible for their Annual Payment.**
6. A chart is given showing the initial annual demand for the Initial Contracting Parties.
7. **The Annual Requirement [E] (minus other system income [R] such as land leases and minerals) shall be equal to the sum of each city's billable usage (in 1000 gallons) times each city's Premium plus the system rate.
 $E-R = \text{@sum}(\text{CityWaterUse} * (\text{normal rate} + \text{city premium rate}))$**
8. Fort Worth shall not pay a premium for water used inside the District, but will pay a premium for water sold outside the District.
9. Each of the Initial Contracting Parties pay a premium based on a set scale for each city. A mechanism is set to reduce the premium each year until it eventually reaches 0.
10. **A surcharge rate will be charged to each customer Party, except for the Fort Worth In District segment. The surcharge revenue shall equal \$282,000 and this sum applied annually to the Fort Worth in district annual payment.**
11. Such premiums and surcharges are the method used to adjust existing facility equity to the Initial Contracting Parties.
12. **Annual Requirements can be recalculated at any time by the District to cover unforeseen costs or savings during a budget cycle.**
13. **The District will furnish each Contracting Party with a monthly schedule of payments by January 15th of each year.**
14. **The District shall provide an adjusted monthly schedule to each Contracting Party by October 1 of each year.**
15. **Payments to the District are due on the 10th of each month.**
16. A procedure is set for contesting payment. However, the scheduled payments must still be paid and the if any contested amount is due or refunded, it shall be done at an interest rate of 10% per annum.
17. **The District can cut off water to any Party with delinquent payments after 60 days.**
18. **After 120 days of delinquency, the rate for other members shall be recalculated to reflect the lost sales revenue and legal proceeding pursued against the delinquent Party to recover due amounts, legal costs and interest.**

Section 5: Special Provisions

- A. The District will operate the system in a prudent and economical manner for the benefit of all the Contracting Parties.
- B. The District will carry insurance on the system. Such insurance will be shown on the books as an O&M expense.

- C. The District will target to have the Project in operation by 1990.
- D. **The District shall own all water supplied up to the Point of Delivery, at which point it will become the property of the buyer upon payment.**
- E. **The District shall NOT demand that the Contracting Parties back their obligations with tax revenue.**
- F. **Contracting Parties shall pay the District from the Party's Water or Water/Sewer Enterprise Funds.**
- G. **Each Contracting Party shall set its customer rates sufficient to maintain their system in good order, including purchases from the District.**

Section 6: Force Majeure

- A. The District and the Contracting Parties shall not be responsible for breaches in the contract as a result of actions outside of their control as defined in "Force Majeure", such as acts of God and nature or political and/or civil disturbances.

Section 7: Unconditional Obligation to Make Payments

- A. All Contracting Parties are responsible for payment of their obligations under this contract, whether or not water is actually delivered or received, in order to meet the payment obligations on Bonds for the Project.

Section 8: Term of Contract; Modification, Notices; State or Federal Laws, Rules, Orders, or Regulations

- A. Term of Contract:
 1. Contract shall effectively start on 3/1/80 and continue until the latter of either all indebtedness being paid or the facilities are no longer useful.
 2. Payments on the 1979-A bonds are deferred until after the first Annual Payment to the District by the Contracting Parties.
 3. This contract shall supercede all previous contracts, however any Contracting Party rights from previous contracts not specifically addressed in this contract will be preserved.
 4. Based on the 10/9/79 State Attorney General Opinion, no provision of this Contract shall conflict with the Base Contract for the protection of Bond holders.
- B. Modification
 1. This Contract cannot be modified in a manner which will affect the prompt repayment of Bonds.
- C. Address and Notice
 1. The legal addresses of the District and Initial Contracting Parties is given.
- D. State or Federal Laws, Rules, Orders or Regulations
 1. This Contract shall be subject to the rules of senior jurisdictions.

Section 9: Points of Delivery; Measurement; Operation of Facilities

- A. Fort Worth
 1. Fort Worth shall take water at Lake Worth and the Clear Fork of the Trinity for the Holly Plant and from the Cedar Creek and Richland pipelines for the Rolling Hills Plant.
 2. Fort Worth shall maintain its intake and distribution systems including

- 3. maintenance on the Lake Worth reservoir.
- 3. The District shall maintain the level of Lake Worth, in a specified manner, from Lake Bridgeport and Eagle Mountain Lake.
- 4. Any waste spillage from Lake Worth will be considered used by Fort Worth and subject to payment to the District.
- 5. The District has the right to flow water through Lake Worth to downstream customers (i.e., River Oaks and TESCO).
- 6. Fort Worth shall accurately meter any water taken, shall keep accurate records, insure proper calibration and pay for any discovered inaccuracies.
- 7. The District has the right to monitor accuracy of metering and records.

B. Arlington

- 1. Arlington shall take water at Lake Arlington.
- 2. The storage in Lake Arlington (conservation capacity) is 56% owned by Arlington and 44% owned by TESCO as per 6/29/55 agreement.
- 3. The District shall maintain the Lake Level from the Cedar Creek and Richland pipelines, which can be back fed from the balancing reservoir (Lake Benbrook).
- 4. When Arlington builds the Southwest Arlington Treatment Plant, it shall be supplied from the Cedar Creek pipeline or the balancing reservoir.
- 5. The District has the right to utilize any storage capacity in Lake Arlington above the conservation level for its own purposes.
- 6. The City of Arlington shall maintain its intake and distribution systems including maintenance on the Lake Arlington Reservoir.
- 7. Any waste spillage from Lake Arlington will be considered used by Arlington and subject to payment to the District.
- 8. Arlington shall accurately meter any water taken, shall keep accurate records, insure proper calibration and pay for any discovered inaccuracies.
- 9. The District has the right to monitor accuracy of metering and records.

C. City of Mansfield

- 1. Mansfield shall draw water from the District's pipeline system.
- 2. Mansfield shall maintain its intake and distribution systems.
- 3. Any waste spillage from the pipeline system will be considered used by Mansfield and subject to payment to the District.
- 4. Mansfield shall accurately meter any water taken, shall keep accurate records, insure proper calibration and pay for any discovered inaccuracies.
- 5. The District has the right to monitor accuracy of metering and records.

D. Trinity River Authority

- 1. TRA is only allowed to serve its Tarrant County Water Project with water purchased from the District. Such areas are described in its North Central Regional Water Supply Study, dated November 1974.
- 2. Delivery to TRA shall be at Lake Arlington.
- 3. TRA shall maintain its intake and distribution systems.
- 4. Any waste spillage from the pipeline system will be considered used by TRA and subject to payment to the District.
- 5. TRA shall accurately meter any water taken, shall keep accurate records, insure proper calibration and pay for any discovered inaccuracies.
- 6. The District has the right to monitor accuracy of metering and records.

Section 10: Advisory Committee

- A. This Contract creates an Advisory Committee made up of one of the voting Council or Board members from each of the four Initial Contracting Parties and one from the

- District.
- B. The Advisory Committee shall adopt by-laws and elect officers of the committee.
- C. The Committee shall consult and advise the District's General Manager on the issuance of bonds, system O&M, contracts with additional contracting parties, sales of water to non-contracting parties, review of the Annual Budget before going to the board, review of the Annual Audit, other pertinent matters, and system improvements including additional water supply sources.
- D. The Committee shall have the right to inspect District facilities and records.
- E. The Committee shall file minutes of its meetings and activities.
- F. Committee members serve for one year starting on March 1. Reappointment is unlimited.
- G. Committee expenses shall be considered District O&M costs.

Section 11: Severability

- A. Any portion of this Contract deemed illegal or invalid will not affect the rest of the contract.

Section 12: Remedies Upon Default

- A. All parties shall have all legal remedies at their disposal in the event of default by any party (except for termination).

Section 13: Venue

- A. Any suits shall be tried in Tarrant County, Texas.

IN WITNESS THEREOF: Signatures, date and seal of all signing parties.

Exhibit D - Texas Water Commission Final Order of Dismissal

- A. Dismissed all standing petitions between the Initial Contracting Parties and the District.
- B. Based on and supported settlement of "City of Arlington, Texas vs. Tarrant County WCID #1 Concerning the Rates to be Charged Arlington for Raw Water Furnished by the District"
- C. Filed with Texas Water Commission on 6/25/82.

Exhibit -Intervention Petition of the Trinity River Authority of Texas

- A. TRA agrees to the Settlement Agreement as modifying their 1979 agreement with the District.
- B. TRA first contracted with the District in 1971 and started taking water in 1973.
- C. Petition Dated 6/25/82 and was approved by the Texas Water Commission.

Final Order of Dismissal

- A. Texas Water Commission agreed on 6/25/82 to allow the dismissal of the City of Arlington's 3/26/80 complaint to the Texas Department of Water Resources due to the acceptance of the Settlement Agreement.

APPENDIX D - CURRENT SUPPLY AND TREATMENT DATA

Current Water Source Data

Current Local Treatment Capacities

Additional Existing Well Data - Page 1

Additional Existing Well Data - Page 2

Data From Summer Heat Wave of 1998

General Well Capacity Information

First Public Meeting Population and Well Projections

CURRENT WATER SOURCE DATA

System	Source	Built	Storage (ac-ft)	Safe Firm Yield (ac-ft/yr)	Annual Refill Yield (ac-ft/yr)	Average Demand (ac-ft/yr)	Maximum Demand (ac-ft/yr)	Supplies
Southeastern Wells Parker County			Unknown	Unknown	2800	2.5	4257	Aledo, Willow Park, Hudson Oaks, Private Systems
Weatherford Fort Worth TRWD System	Lake Weatherford	1957	19470	2240	19470	3069	8961	Weatherford
Tarrant Regional Water District Western System (West Fork)	Lake Bridgeport	1931	374836	Unknown	374836	185272	392051	Fort Worth and 27 other Tarrant County customer entities
Tarrant Regional Water District Western System (Other)	Eagle Mountain Lake	1932	177520	2	177520	17	8	
Tarrant Regional Water District Eastern System	Lake Worth	1914	37775	71	37775	165.4	350	
Tarrant Regional Water District Eastern System	Total	1957	590131	23000	590131	527		Fort Worth System, Other towns near these lakes
Tarrant Regional Water District Eastern System	Lake Arlington	1957	38785	21	38785	35		Arlington, Mansfield, TRAW (West)
Tarrant Regional Water District Eastern System	Cedar Creek Lake	1966	637180	156	637180	569		All customer systems in Tarrant County and Weatherford
Tarrant Regional Water District Eastern System	Richland-Chambers	1987	1136600	187	1136600	1015		All customer systems in Tarrant County and Weatherford
Tarrant Regional Water District Eastern System	Lake Benbrook	1952	88250	6	88250	79		All customer systems in Tarrant County and Weatherford
Tarrant Regional Water District TOTAL	Total		2490946	414721	2490946	2224	616079	550

CURRENT TREATMENT PLANT CAPACITIES

Entity	Treatment (mgd)	Population	Maximum Available Flow per Person (gpd)	Maximum Available Flow per Customer (gpd)
Eastern Parker County				
Weatherford	8,000,000	20,000	400	1200
Fort Worth	350,000,000	700,000	500	1500
TRA (West)	57,000,000	184,000	310	929
Arlington	93,000,000	261,721	355	1066
Mansfield	10,000,000	15,607	641	1922

Note: A recent study by TRWD of its existing customers reported flows per person ranging from 50 gpd to 270 gpd. These values cover a time range from the present to year 2050.

ADDITIONAL WELL DATA - PAGE 1

Entity	Well No.	Location	Formation	Date Drilled	Depth (ft)	Maximum Flow (gpm)	Average Production (gpd)	Maximum Flow (gpd)	Normal Operation (hrs/day)	Percent Running	Avg. Pop. Served	Max. Pop. Served
Willow Park	1	East Lake	Paluxy			52	64000	74880	20.5	85%	222	260
Willow Park	2	East Lake	Paluxy			26	26000	37440	16.7	69%	90	130
Willow Park	3	East Lake	Paluxy			54	65000	77760	20.1	84%	226	270
Willow Park	4	East Lake	Paluxy			35	38000	50400	18.1	75%	132	175
Willow Park	5	Indian Camp	Paluxy			40	52000	57600	21.7	90%	181	200
Willow Park	6	Ridge	Paluxy			70	89000	100800	21.2	88%	309	350
Willow Park	7	White Settlement Rd.	Paluxy			50	60000	72000	20.0	83%	208	250
Willow Park	8	Ranch House	Paluxy			13	13000	18720	16.7	69%	45	65
Willow Park	9	Ranch House	Paluxy			93	127000	133920	22.8	95%	441	465
Willow Park	10	Surry	Paluxy			56	69000	80640	20.5	86%	240	280
Willow Park	11	Squaw Creek	Paluxy			37	49000	53280	22.1	92%	170	185
Willow Park	12	Willow Wood N./Circle Dr.	Paluxy			24	27000	34560	18.8	78%	94	120
Willow Park	13	Willow Wood S./Royal View	Paluxy			21	25000	30240	19.8	83%	87	105
Willow Park	14	Willow Springs N./ Plant	Paluxy			12	13000	17280	18.1	75%	45	60
Willow Park	15	Willow Springs S./ Plant	Paluxy			41	52000	59040	21.1	88%	181	205
Willow Park	16	Indian Camp	Paluxy			25	26000	36000	17.3	72%	90	125
Willow Park	17	Indian Camp	Trinity			140	173000	201600	20.6	86%	601	700
Willow Park	18	Willow Springs Oaks/Circle Lane	Paluxy			67	80000	96480	19.9	83%	278	335
Totals						856	1048000	1232640	19.8	82%	3639	4280
Averages						48	58222	68480	19.8	82%	202	238
Aledo	1	Front Street	Paluxy		204	56	42000	80640	12.5	52%	146	280
Aledo	2	Queen Street	Paluxy		306	38	50000	54720	21.9	91%	174	190
Aledo	3	1187 South	Paluxy			12	16000	17280	22.2	93%	56	60
Aledo	4	Rolling Hills	Paluxy		235	58	81000	83520	23.3	97%	281	290
Aledo	5	1187 South	Paluxy			28	38000	40320	22.6	94%	132	140
Aledo	6	SW FM 5	Trinity		600	115	120000	165600	17.4	72%	417	575
Totals						307	347000	442080	20.0	83%	1205	1535
Averages						51	57833	73680	20.0	83%	201	256
Deer Creek	1	Ridgecrest	Paluxy		252	105	136800	151200	21.7	90%	475	525
Deer Creek		Ridgecrest	Trinity		561	120	151200	172800	21.0	88%	525	600
Deer Creek		Quail Run	Trinity		480	165	187200	237600	18.9	79%	650	825
Totals						390	475200	561600	18.9	79%	1650	1950

ADDITIONAL WELL DATA - PAGE 2

Entity	Well No.	Location	Formation	Date Drilled	Depth (ft)	Maximum Flow (gpm)	Average Production (gpd)	Maximum Flow (gpd)	Normal Operation (hrs/day)	Percent Running	Avg. Pop. Served	Max. Pop. Served
Hudson Oaks	1	Green Oaks Lot 1A	Paluxy	04/01	240	22	25344	31680	19.2	80%	88	110
Hudson Oaks	2	Green Oaks Lot 1A	Paluxy	06/03	200	18	20736	25920	19.2	80%	72	90
Hudson Oaks	3	Green Oaks Lot 34	Paluxy	05/15	309	55	63360	79200	19.2	80%	220	275
Hudson Oaks	4	Diamond Oaks Lot 32	Paluxy	04/01	255	30	34560	43200	19.2	80%	120	150
Hudson Oaks	5	Diamond Oaks Lot 6C	Paluxy	08/04	196	55	63360	79200	19.2	80%	220	275
Hudson Oaks	6	Diamond Oaks Saddlebrook	Paluxy	08/01	225	9	10368	12960	19.2	80%	36	45
Hudson Oaks	7	Diamond Oaks Saddlebrook	Paluxy	06/01	220	17	19584	24480	19.2	80%	68	85
Hudson Oaks	8	Diamond Oaks Saddlebrook	Paluxy	08/02	204	80	92160	115200	19.2	80%	320	400
Hudson Oaks	9	Diamond Oaks Lot 5D	Paluxy	08/26	260	24	27648	34560	19.2	80%	96	120
Hudson Oaks	10	Diamond Oaks Lot 5D	Paluxy	08/01	230	70	80640	100800	19.2	80%	280	350
Hudson Oaks	11	Diamond Oaks G.O. Lot 6B	Paluxy	04/25	275	47	54144	67680	19.2	80%	188	235
Hudson Oaks	12	Hidden Oaks, Block 2, Lot 5	Paluxy	11/30	208	55	63360	79200	19.2	80%	220	275
Hudson Oaks	13	Hidden Oaks, Well 2	Paluxy	08/08	220	20	23040	28800	19.2	80%	80	100
Hudson Oaks	14	Hudson Heights, Blk 5 Lot 10	Paluxy	1972	240	22	25344	31680	19.2	80%	88	110
Hudson Oaks	15	Hudson Heights, Blk 5 Lot 10	Paluxy	1977	210	18	20736	25920	19.2	80%	72	90
Hudson Oaks	16	Lakeshore, Block 9 Lot 8	Paluxy	05/03	231	40	46080	57600	19.2	80%	160	200
Hudson Oaks	17	Lakeshore, Block 9 Lot 8	Paluxy	12/07	130	12	13824	17280	19.2	80%	48	60
Hudson Oaks	18	Lakeshore, Block 9 Lot 12	Paluxy	06/21	240	56	64512	80640	19.2	80%	224	280
Hudson Oaks	19	Lakeshore LH, Block 1 Lot 1	Paluxy	01/20	217	16	18432	23040	19.2	80%	64	80
Hudson Oaks	20	Lakeshore LH, Block 5 Lot 7	Paluxy	01/28	200	55	63360	79200	19.2	80%	220	275
Hudson Oaks	21	Lakeshore LH, Block 1 Lot 5	Paluxy	08/08	215	65	74880	93600	19.2	80%	260	325
Totals						786	905472	1131840	19.2	80%	3144	3930
Averages						37	43178	53897	19.2	80%	150	187
Highland	1	Yucca	Paluxy	06/15	170	60	13565	86400	3.8	16%	47	300
Highland	2	Yucca	Paluxy	12/28	180	50	4925	72000	1.6	7%	17	250
Highland	3	Oak Park	Paluxy	03/13	135	65	24019	93600	6.2	26%	83	325
Totals						175	42509	252000	3.9	16%	148	875
Averages						58	14170	84000	3.9	16%	49	292
Dyegard	1	Devon	Paluxy	02/18	248	70	57600	100800	13.7	57%	200	350
Dyegard	2	Bankhead	Paluxy	08/15	260	60	57600	86400	16.0	67%	200	300
Totals						130	115200	187200	14.9	62%	400	650
Averages						65	57600	93600	14.9	62%	200	325

DATA FROM SUMMER HEAT WAVE (DROUGHT) OF 1998

Month	City	Customers	Total Usage Gallons	Days in Month	Average Customer Use Gal/Mo	Average Customer Use Gal/day	Customer Use gpm	Comments
June 98	Hudson Oaks	647	14,009,800	30	21,653	722	0.50	
June 98	Hudson Oaks, w/o Diamond Oaks	391	6,768,800	30	17,312	577	0.40	
June 98	Diamond Oaks	256	7,241,000	30	28,285	943	0.65	
June 98	Willow Park	1,000		30	16,000	533	0.37	One Week of Odd/Even (Willow Springs Oaks, 3 weeks)
June 98	Aledo	500	8,500,000	30	17,000	567	0.39	
June 98	Deer Creek Estates	187	7,841,400	30	41,933	1,398	0.97	Water Rationing 2 weeks (Odd/Even)
July 98	Hudson Oaks	650	23,464,800	31	36,100	1,165	0.81	Odd/Even Rationing starting July 17
July 98	Hudson Oaks, w/o Diamond Oaks	396	12,265,800	31	30,974	999	0.69	Odd/Even Rationing starting July 17
July 98	Diamond Oaks	254	11,199,000	31	44,091	1,422	0.99	Odd/Even Rationing starting July 17
July 98	Willow Park	1,000		31	24,700	797	0.55	All Month Odd/Even (6 hrs/day first half of month, 4 hrs/day last half)
July 98	Aledo	500	10,500,000	31	21,000	677	0.47	Odd/Even Rationing (4 hours/day last part of month)
July 98	Deer Creek Estates	187	7,340,800	31	39,256	1,266	0.88	Production went down 1/3 due to drawdown (10' drop) (Odd/Even Rationing All Month)
July 98	Springtown	796	12,855,000	31	16,149	521	0.36	

GENERAL WELL CAPACITY INFORMATION

Entity	CCN	1997 Current Population	1997 Current Customers	Current Annual Growth Rate	Number of Wells	Capacity Of Largest Well (gpm)	Current Public Production Capacity	Average Production Capacity Per Well	TNRCC Population Capacity Wells	* Next Required Well Upgrade	Current Storage Capacity	TNRCC Population Capacity Storage	Next Required Storage Upgrade
Willow Park	11814/ 11580	3550	1183	0.0554	18	140	856	48	3580	1998	1075000	1792	1998
Hudson Oaks	12273	1200	607	0.0806	21	80	786	37	3530	2004	801000	1335	1999
Aledo	10264	1400	474	0.0216	6	115	307	51	960	1998	561200	935	1998
Annetta North													
Annetta South													
Annetta													
Parker County		12500		0.0335									
Bluebonnet Hills	12290												
Freetop Utilities	12733												
Deer Creek Waterworks	12027												
Spring Valley Water	11844												
Dyegard	12747		57		2	70	130	65			168000		
Highland	11970		138		3	65	175	58			108000		
Central Texas Utilities	11719	414											
Weatherford		18550		0.034									
Fort Worth		485500		0.0118									

Calculated as total well capacity less highest capacity well. Used TNRCC 0.6 gpm per connection with 3 people per connection.

FIRST PUBLIC MEETING POPULATION AND WELL PROJECTIONS (APRIL 1998)

	1998 Population	Existing Wells	Yr. 1998 Needed Wells	Yr. 2000 Projected Population	Yr. 2000 Needed Wells	Yr. 2030 Projected Population	Yr. 2030 Needed Wells
Willow Park	3450	18	16	3807	18	16641	77
Aledo	1450	6	7	1530	7	3433	16
Hudson Oaks	1250	21	6	1440	7	11953	55
Annetta	883	0	4	945	4	2630	12
Annetta North	348	0	2	373	2	1037	5
Annetta South	543	0	3	581	3	1616	7

APPENDIX E - COST FACTORS

Cost Indices

Inflation Cost Factors

Other Data and Calculations

COST FACTORS

PRICE INDICES

Year	Consumer Price Index	CPI Annual Rate	CPIx20	ENR Index	ENR Annual Rate
1950	24.1		482	510	
1951	26.0	7.88%	520	543	6.47%
1952	26.5	1.92%	530	569	4.79%
1953	26.7	0.75%	534	600	5.45%
1954	26.9	0.75%	538	628	4.67%
1955	26.8	-0.37%	536	660	5.10%
1956	27.2	1.49%	544	692	4.85%
1957	28.1	3.31%	562	724	4.62%
1958	28.9	2.85%	578	759	4.83%
1959	29.1	0.69%	582	797	5.01%
1960	29.6	1.72%	592	824	3.39%
1961	29.9	1.01%	598	847	2.79%
1962	30.2	1.00%	604	872	2.95%
1963	30.6	1.32%	612	901	3.33%
1964	31.0	1.31%	620	936	3.88%
1965	31.5	1.61%	630	971	3.74%
1966	32.4	2.86%	648	1019	4.94%
1967	33.4	3.09%	668	1074	5.40%
1968	34.8	4.19%	696	1155	7.54%
1969	36.7	5.46%	734	1269	9.87%
1970	38.8	5.72%	776	1381	8.83%
1971	40.5	4.38%	810	1581	14.48%
1972	41.8	3.21%	836	1753	10.88%
1973	44.4	6.22%	888	1895	8.10%
1974	49.3	11.04%	986	2020	6.60%
1975	53.8	9.13%	1076	2212	9.50%
1976	56.9	5.76%	1138	2401	8.54%
1977	60.6	6.50%	1212	2576	7.29%
1978	65.2	7.59%	1304	2776	7.76%
1979	72.6	11.35%	1452	3003	8.18%
1980	82.4	13.50%	1648	3237	7.79%
1981	90.9	10.32%	1818	3535	9.21%
1982	96.5	6.16%	1930	3825	8.20%
1983	99.6	3.21%	1992	4066	6.30%
1984	103.9	4.32%	2078	4146	1.97%
1985	107.6	3.56%	2152	4195	1.18%
1986	109.6	1.86%	2192	4295	2.38%
1987	113.6	3.65%	2272	4406	2.58%
1988	118.3	4.14%	2366	4519	2.56%
1989	124.0	4.82%	2480	4615	2.12%
1990	130.7	5.40%	2614	4732	2.54%
1991	136.2	4.21%	2724	4835	2.18%
1992	140.3	3.01%	2806	4989	3.19%
1993	144.5	2.99%	2890	5210	4.43%
1994	148.2	2.56%	2964	5408	3.80%
1995	152.4	2.83%	3048	5471	1.16%
1996	156.9	2.95%	3138	5620	2.72%
1997	160.5	2.29%	3210	5825	3.65%
1998	163.0	1.56%	3260	5921	1.65%
Average		4.11%			5.28%

COST FACTORS

PIPE LINES (all inclusive, complete in place)

Type	Size Dia. (in.)	In-house Est 1998 (\$/L.F.)	Initial Construction Cost				CDM 1998 adj. (\$/L.F.)	Cost Used (\$/L.F.)	Annual O&M (\$/L.F.)
			Constructor 1998 (\$/L.F.)	Willow Park 1998 (\$/L.F.)	CDM 1989 (\$/L.F.)				
PVC	6	40						40	
PVC	8	45						45	
PVC	10	50						48	
PVC	12	60		50				55	
DIP/CYL	16		80		53	65		65	
DIP/CYL	20		120					80	
DIP/CYL	24		150		74	91		95	
DIP/CYL	30							105	
DIP/CYL	36							115	

COST FACTORS

TREATMENT PLANTS

Size m3/sec	Size mgd	Total Cost \$	Source/ Criteria	Source Cost per MGD \$/mgd	Current Cost Conversion Factor	Current Cost per MGD \$/mgd	Cost Per gal/day Rating
	0.03	20,000	O3water/Current	694,444	1.000	694,444	0.694
	0.14	173,810	O3water/CCI=4992	1,203,670	1.180	1,420,331	1.420
0.05	1.14	230,000	JMM/ CCI=1000	201,578	5.921	1,193,541	1.194
0.06	1.37	270,000	JMM/ CCI=1000	197,195	5.921	1,167,594	1.168
0.07	1.60	300,000	JMM/ CCI=1000	187,805	5.921	1,111,994	1.112
0.08	1.83	330,000	JMM/ CCI=1000	180,762	5.921	1,070,295	1.070
0.09	2.05	355,000	JMM/ CCI=1000	172,850	5.921	1,023,447	1.023
0.10	2.28	380,000	JMM/ CCI=1000	166,521	5.921	985,968	0.986
0.20	4.56	620,000	JMM/ CCI=1000	135,846	5.921	804,343	0.804
0.30	6.85	780,000	JMM/ CCI=1000	113,935	5.921	674,610	0.675
0.40	9.13	1,000,000	JMM/ CCI=1000	109,553	5.921	648,663	0.649
0.50	11.41	1,200,000	JMM/ CCI=1000	105,171	5.921	622,717	0.623
0.60	13.69	1,400,000	JMM/ CCI=1000	102,249	5.921	605,419	0.605
0.70	15.97	1,500,000	JMM/ CCI=1000	93,903	5.921	555,997	0.556
0.80	18.26	1,600,000	JMM/ CCI=1000	87,642	5.921	518,931	0.519
0.90	20.54	1,700,000	JMM/ CCI=1000	82,773	5.921	490,101	0.490
1.00	22.82	1,850,000	JMM/ CCI=1000	81,069	5.921	480,011	0.480
2.00	45.64	3,000,000	JMM/ CCI=1000	65,732	5.921	389,198	0.389

COST FACTORS

TREATMENT PLANTS

(excluding land, reservoirs, intake or pumping)

Type	Size (mgd)	Land Needed (Acre/mgd)	Rule of Thumb 1998 (\$/gal)	Initial Construction Cost		Use 1998 (\$/gal)	JMM 26% (\$)	Annual O&M CDM 7.50% (\$)	Use 15% (\$)
				JMM 1998 Adj (f=5.921) (\$)	CDM 1998 Adj. (f=1.23) (\$)				
0.5 MGD	0.5	1	1.00	500,000	1.85	1.40	700,000	52,500	105,000
1.0 MGD	1	1	1.00	1,000,000	1.85	1.30	1,300,000	97,500	195,000
2.0 MGD	2	1	1.00	2,000,000	1.85	1.25	2,500,000	187,500	375,000
4.0 MGD	4	1	1.00	4,000,000	1.85	1.00	4,000,000	300,000	600,000
6.0 MGD	6	1	1.00	6,000,000	1.23	0.92	5,500,000	412,500	825,000

COST FACTORS		
PUMPING		
Type	Initial Construction Cost CDM 1998 Adj. \$/gpm	Annual O&M \$/gallon
Intake Structure	0.05	
Raw Water Boosters	150	
Treated Water Boosters	150	

COST FACTORS		
INTAKE		
Type	\$/each	Annual O&M \$/gallon
Intake Structure	60000	

APPENDIX F - MEETING SUMMARIES

First Public Meeting - 4/29/98

Summary Packet Cover Letter

Meeting Notice

Sign In Sheet

Contact Sheet

Slide Presentation

Meeting Summary

Second Public Meeting - 9/4/98

Summary Packet Cover Letter

Press Release

Sign In Sheets

Slide Presentation

Meeting Summary

Third Public Meeting - 1/4/99

Press Release

Slide Presentation

TEAGUE NALL AND PERKINS
CONSULTING ENGINEERS

May 6, 1998

The Weatherford Democrat
512 Palo Pinto Street
Weatherford, TX 76086
Attn: Don Parker

RE: Meeting Summary
Southeastern Parker County Water Study
TWDB Project No.
TNP Project No. PCU97237


Dear Participant:

Thank you for your interest in the Southeastern Parker County Water Study. As you are probably aware, the initial public meeting for the study was held last Wednesday, April 29, 1998 at the City of Hudson Oaks. To all who attended the meeting, your time and effort are greatly appreciated. The study is off to a successful beginning, largely due to the cooperation of the participants. If you have not yet completed the questionnaire mailed in April, please do so as soon as possible. Responses to the questionnaire are vital to the accuracy of the study.

Attached for your information are a summary of the slide presentation made at the meeting and a copy of the question and answer session that followed the presentation. Also included with this packet are lists of the meeting attendees and the Study Contact Sheet. Again, we urge you to stay involved in the study process and attend future meetings to discuss specific options for providing water to this area. Should you have any questions, comments or information to provide us for the study, please feel free to call Kelly Carta or me at (817) 336-5773. Again, thank you for your interest and participation.

Very truly yours,

TEAGUE NALL AND PERKINS, INC.


Kelly Dillard, P.E.

e-mail: kcarta@tnp-online.com
kdillard@tnp-online.com

Enclosures: Meeting Summary
Slide Presentation
Attendees list
Study Contact Sheet

915 FLORENCE STREET
FORT WORTH, TEXAS 76102
(817) 336-5773
FAX (817) 336-2813

2001 W. IRVING BLVD.
IRVING, TEXAS 75061
(972) 254-1765
METRO (972) 251-1627
FAX (972) 251-4348

Sign-In Sheet
Southeastern Parker County Water Study
First Public Meeting
Hudson Oaks City Hall
7:00 p.m. - April 29, 1998

	Name	Representing	Phone Number	Fax Number	E-Mail
1	Kelly Dillard	Teague Nall and Perkins, Inc.	(817) 336-5773	(817) 336-2813	kdlillard@inp-online.com
2	Curtis Johnson	TWDB	(512) 463-8060	(512) 936-0889	
3	J. P. & Neil Binion	Self	(817) 594-8900		
4	Donnie Cole	City of Hudson Oaks	(817) 594-0302	(817) 596-8829	
5	Elvera & Harold Johnson	Parker County	(817) 596-5202		
6	Gene L. Voyles	City of Hudson Oaks	(817) 341-3170		
7	Bob Lewis	City of Aledo	(817) 441-7016	(817) 441-7520	mayorbob@flash.net
8	Dickie Smethers	STES	(817) 441-7533	(817) 441-6900	
9	Bob McClelland		(817) 441-7456		
10	C. Guy Natale	City of Willow Park	(817) 441-7108	(817) 441-6900	willowpark1@juno.com
11	Les Cooley	Mayor, Willow Park	(817) 441-7108	(817) 341-4411	barco5@juno.com
12	Tom Crew	Tree Top Utilities	(817) 535-4802	(817) 535-8647	
13	Ben Long	Parker County	(817) 598-6184	(817) 598-6199	
14	Dora Long	Self			
15	Gary Plugge	Self	(817) 594-2116		
16	Jeanne Yoder	Self	(817) 441-9537		
17	Lee C. Bradley Jr.	Fort Worth Water Department	(817) 871-8246		
18	Wayne Owen	Tarrant Regional Water District	(817) 335-2491	(817) 877-5137	wowen@trwd.com
19	James Dickason	City of Weatherford	(817) 598-4250	(817) 598-4138	james4833@aol.com
20	A. G. Swan	PCUD #1	(817) 220-5585	(817) 220-5585	
21	Kelly Carta	Teague Nall and Perkins, Inc.	(817) 336-5773	(817) 336-2813	kcarta@inp-online.com
22	Forrest Thompson	Hudson Oaks	(817) 594-0302		
23	Carolyn McKinney	Annetta	(817) 441-7552	(817) 441-7753	
24	Pat Perry	Annetta North	(817) 441-8850	(817) 441-5770	neumac1@airmail.net
25	Pat Tracey	105 Jennifer Ct., Weatherford	(817) 596-8545		
26	Mark Berry	Teague Nall and Perkins, Inc.	(817) 336-5773	(817) 336-2813	mberry@inp-online.com
27	Bob Salinas	Teague Nall and Perkins, Inc.	(817) 336-5773	(817) 336-2813	
28	Sam Brush	NCTCOG	(817) 695-9213	(817) 640-7806	sam@nctcog.dist.tx.us

Southeastern Parker County Water Study Contact Sheet

Entity	CCN No.	Address	Contact/Title	Phone	Fax	Coverage
Parker County Utility District #1 % City of Springtown		P.O. Box 444 Springtown, Texas 76082	Waymon Wright, Board Chairman	817-220-2006	817-523-3179	NE Parker County
City of Aledo	10264	200 Old Annetta Rd., P.O. Box 1 Aledo, Texas 76008	J. E. Fickett, City Administrator	817-441-7016	817-441-7520	Aledo
City of Willow Park	11814 11580	101 Stagecoach Trail Willow Park, Texas 76087	Les Cooley, Mayor	817-441-7108	817-441-6900	Willow Park
City of Hudson Oaks	12273	150 North Oakridge Drive Hudson Oaks, Texas 76087	Forrest G. Thompson, Mayor <i>Gene Volker, Mayor</i>	817-594-0302	817-596-8829	Hudson Oaks
n of Annetta		1198 Old Annetta Road P.O. Box 191 Annetta, Texas 76008	Pat Perry, City Secretary	817-441-5770		Annetta
n of Annetta South		P.O. Box 61 Aledo, Texas 76008	Doug Koldin, Mayor	817-441-9527		Annetta South
n of Annetta North		P.O. Box 262 Aledo, Texas 76008	Edward K. Hensley, Mayor	817-441-5683		Annetta North
Parker County		1 Courthouse Square Weatherford, Texas 76086	Ben Long, County Judge	817-598-6148	817-598-6199	Unincorporated/NonCCN Areas
City of Weatherford	10282	303 Palo Pinto, P.O. Box 255 Weatherford, Texas 76086	Kenneth W. Reneau, City Mgr.	817-598-4000	817-598-4115	Weatherford
City of Fort Worth		1000 Throckmorton Street Fort Worth, Texas 76102	Bob Terrell, City Mgr.	817-871-8900	817-871-6134	Fort Worth
Tarrant Regional Water District		800 E. North Side Drive P.O. Box 4508 Fort Worth, Texas 76164	James M. Oliver, General Mgr.	817-335-2491	817-877-5137	Fort Worth Area Trinity Surface Water
TX Water Development Bd.		P.O. Box 13231 Austin, Texas 75480	Curtis Johnson, Contract Mgr.	512-463-7847	512-936-0889	Entire Study Area
TNRCC		Region 4 1101 E. Arkansas Ln. Arlington, Texas 76010-6499	Sid Slocum, Water Program Mgr.	817-469-6750	817-795-2946	Entire Study Area

Southeastern Parker County Water Study Contact Sheet

Entity	CCN No.	Address	Contact/Title	Phone	Fax	Coverage
Bluebonnet Hills WSC	12290	P.O. Box 311 Cresson, Texas 76035	Dede Grizzard, Office Mgr.	817-396-4563	None	Bluebonnet Hills Subdivision
Treetop Utilities, Inc.	12733	4646 Mansfield Highway Fort Worth, Texas 76119-7504	Tom Crew, Owner	817-535-4802	817-535-8647	Treetop Estates in SE Corner of County
Deer Creek Waterworks, Inc.	12027	208 South Front Street P.O. Box 568 Aledo, Texas 76008	Doyle Hanley, Owner	817-441-9735	817-441-6605	Deer Creek Estates; (441-9402)
Spring Valley Water Company	11844	3671 Hwy. 78 N. Farmersville, Texas 75442	Eddy Daniel, Receiver	972-606-3221		
Dyegard Water Company	12747	3211C Fort Worth Highway Weatherford, Texas 76087	Mike Dyer/ Tim Megard/Don Dickens, Partners/ Mgr.	817-596-5050	817-596-7490	Oakview
Highland Water Supply Corp.	11970	3211C Fort Worth Highway Weatherford, Texas 76087	V.M. Carpenter/ Don Dickens, President/ Mgr.	817-599-6126	817-596-7490	Highland Park, Valley Del Arroyo, Valley Trail
North Central Texas COG		P.O. Box 5888 Arlington, Texas 76005-5888	R. Michael Eastland, Exec. Dir.	817-640-3300	817-640-7806	
Central Texas Utilities	11719	P.O. Box 136669 Fort Worth, Texas 76136	Billy Green/Debbie Key, Owner/Mgr.	817-237-8488	817-237-9217	Took over Thompson Utilities
Abrazas Utility	11596*	7921 Main St. Fort Worth, Texas 76180	Evelyn Freeman Farhood/Laura Farhood, Owner/Mgr.	817-498-8500	817-498-4350	Hilltop Edition
ST Environmental		P.O. Box 122175 Fort Worth, Texas 76121-2175	Lloyd Stafford, Area Mgr.	817-441-7533	817-441-6900	Willow Park
The Weatherford Democrat		512 Palo Pinto Street Weatherford, TX 76086	Don Parker	817-594-7447	817-594-9734	Media
The Community News		PO Box 973 213 East Oak Aledo, TX 76008	Randy Keck, Editor	817-441-7661	817-441-5419	Media
Gary Plugge		207 DeLa Cruz Weatherford, TX 76086	Gary Plugge	817-594-2116		Precinct 4, Candidate

WELCOME

Southeastern Parker County Water Study

FIRST PUBLIC MEETING

Funding By
The Texas Water Development Board,
The Cities of Willow Park, Aledo and Hudson Oaks
and the County of Parker

In Association with
Parker County Utility District Number 1

Purpose of Meeting Why Are We Here?

- To introduce this project to the public
- To discuss the needs and objectives of the study
- To receive public input regarding local water issues and concerns

Background History

Who Is PCUD #1?

- Parker County Utility District Number 1 was created in 1997
- Established to provide regional utilities (water and sewer)
- Three of the participant cities and the county of Parker asked PCUD #1 to provide assistance with a TWDB Regional Water Study in Southeastern Parker County

Background History

What Is "The Grant"?

- Texas Water Development Board offers 50% grant funding for regional water/sewer studies
- PCUD #1 acts as an umbrella agency for the county and the cities involved
- Texas Water Development Board has agreed to fund \$26,500 which is 50% of the Study cost. Aledo, Hudson Oaks, Willow Park and Parker County to fund the remainder.

The Study

What Will The Study Do?

- Evaluate and determine the most feasible alternatives to meet water supply needs for the next 30 years
- Estimate costs associated with implementing these alternatives
- Identify institutional arrangements to provide water supply services

The Study

Who Will Do The Study?

- Teague Nall and Perkins, Inc. (Est. 1976)
- Currently serving over 25 cities and more than 40 total public clients in Texas
- Have provided services for Springtown, PCUD #1, Weatherford and Willow Park
- Have experience with TWDB Grant and Loan Projects including recent Walnut Creek Basin Regional Wastewater Study

Study Schedule

How Long Will This Take?

- Grant application (completed Fall 1997)
- Data acquisition (current phase)
- Development of service options (Summer 1998)
- Final report (late Fall 1998)

Current Status

What Do We Know Now?

- Southeastern Parker County population is growing rapidly (3.4% in 7 years)
- Current water supply is from wells (groundwater)
- Some systems have reported intermittent problems with operating pressure and quality

Current Providers

The Following Currently Supply Water to the Study Area:

Entity	OGA	Population	Customers
Alledo	19284	1400	470
Hudson Oaks	12275	1200	607
Willow Park	11816480	3600	1100
Parker County		12600	
TOTAL		18600	2264
Shubertown Hills	12230		
Central Texas Utilities	11719		
Deer Creek Waterworks	22627		
Dryden	12747		07
Highland	11970	414	138
Spring Valley	11844		
Tredsp	12730		

Current Status

General Well Information

The following data represent the average well for Willow Park, Alledo and Hudson Oaks

- 43 Gallons per minute per well
- 72 Residential connections per well
 - (Based on 0.8 gallons per minute per customer)
- 217 People per well
 - (Based on 3 people per connection)
- 2 Acres per well are highly restricted
 - (Based on well plus 150' radius control easement)
- 18 Acres per well affected
 - (Based on well plus 500' radius zone for some situations)

Current Status

Is Supply Meeting Demand?

Entity	Current Number of Wells	Max. Well Production (gpm)	Year Next Well Upgrade Needed
Alledo	6	307	1998
Hudson Oaks	21	786	2004
Willow Park	18	636	1998
TOTAL	45	1949	

Future Status

What To Expect In The Year 2028 With Wells

Entity	2028 Population	Total Wells Needed	Total Land Needed (2 acres per well)	Total Land Impacted (18 acres per well)
Alledo	2718	13	26	228
Hudson Oaks	13288	61	122	1101
Willow Park	18487	87	174	1567
Parker County	34716	160	320	2880
TOTAL	69568	321	642	5773

Current Status

What About Quality?

- Wells are subject to contamination
- Wells can be vulnerable due to minimal treatment

Current Status

What Are The Options?

- Continue developing underground wells
- Obtain and treat raw surface water
- Obtain treated water from neighboring entities
- A combination of options listed above

Future

What Do We Do Now?

- Quantify population growth trends
- Determine projected water demands
- Determine availability from known sources
- Determine costs of pursuing options to provide reliable, quality water service

Future

How Do We Accommodate Population Expansion?

- Each city and water utility continues to develop its own resources
- Cities and utilities regionalize

Help

How Can You Help?

- Supply information on existing facilities and populations. (Hudson Oaks, Willow Park and Aledo have already done this)
- Let us know of any problems or concerns regarding the current water system
- Stay involved in this process and attend future meetings

You Can Make a Difference

THANK YOU

- Thank you for your interest and input in this effort. By working together, we can assure the availability of quality water throughout Southeast Parker County for the next 30 years.

PCUD #1
SOUTHEASTERN PARKER COUNTY WATER STUDY
PUBLIC MEETING NO. 1
HUDSON OAKS COUNCIL CHAMBERS

APRIL 29, 1998
7:00 p.m.

MEETING SUMMARY

Kelly Carta (JKC) of Teague Nall and Perkins (TNP) opened the meeting with a welcome and introductions of TNP staff and representatives from Texas Water Development Board, Parker County Utility District Number 1, Willow Park, Hudson Oaks, Aledo, Annetta, Annetta North and Parker County. A list of meeting attendees is attached to this summary. JKC made a presentation of the project, including its purpose, status, goals and objectives. A copy of the overhead projector slides used in the presentation are included as part of this packet. After the slide presentation, JKC opened the meeting up for a question/answer session. Below is an overview of the session.

Q - Hudson Oaks: What are the prospects for supplying water to this area?

A - JKC: We are probably moving away from ground water sources and toward a surface water supply or an alliance with a provider (neighboring city) who is already treating water.

Q - Aledo: Will this study result in multiple options, or one specific recommendation?

A - JKC: At the next meeting we will provide three alternatives for a possible solution. The recommendations will be on a large scale, conceptual in nature, but will recommend specific sizes for needed water lines, plants, wells, etc.

Mark Berry (TNP): (later in discussion) To clarify, there will be one specific recommended solution at the end of the report. The solution will probably include surface water as the source. The other alternatives listed will and are being considered but do not appear as feasible at this time for many of the reasons discussed this evening. In addition, the solution will most likely recommend some form of a regional approach. At the interim meeting TNP will present 3 alternatives for your input and discussion. A final solution will be chosen from these alternatives based on your input and a cost/benefit analysis.

Q - Parker County: Will this study consider creation of a utility district to serve this area?

A - JKC: Possibly. At this stage of the study it is too early to say.

Q - Judge Long: In a long drought, well water can dry up very quickly, as it did in the 1950s.

A - JKC: Yes, that is correct. That concern, evidenced somewhat in 1996, is one of the main reasons for this study.

Q - Willow Park: Is this study coordinating with the City of Weatherford and their efforts to get water from the Benbrook Reservoir?

A - Weatherford: Yes. We are not planning to construct our portion of the transmission line until after the year 2000 unless a drought condition or some other necessity arises.

Q - Hudson Oaks: Do we need to meet with cities that can potentially serve this area?

A - JKC: Yes. That is part of the scope of this study and is already underway.

Q - Aledo: Is there reason to look beyond the Trinity river basin for potential sources of surface water supply?

A - JKC: We have considered both the Trinity and the Brazos basins. At this time, the Brazos is not a viable source due in part to its proximity to the service area and treatment issues related to the salinity content of the water. As western Parker County continues to develop, the Brazos may become a more viable alternative. Under the current Senate Bill 1, all of Parker County is associated with the Trinity Basin for planning purposes.

Q - Hudson Oaks: Most wells in the area are in the Paluxy formation. What is the availability of wells from the lower Trinity formation?

A - JKC: Most of the wells in this area are drilled to the Paluxy formation, however, some of the wells are already to the Trinity formation. In general, water supply in the Trinity formation is greater, due in part to the fact that it is deeper and has not been tapped as much. Also, its recharge zone is farther away, allowing more time for filtering, thus making it better quality water. There is no guarantee that drilling to the deeper depths of the Trinity formation will provide a higher yield well. Typical well production from the Trinity formation is estimated to be 140-170 gpm for this area.

A - Judge Long: However, the Trinity formation is generally a fine sand formation in this area and tends to lead to sand infiltration into the well water.

Curtis J. (TWDB): It is refreshing to have such seeming cooperation at this type of meeting. The group is to be commended for their civil and forward thinking approach to the issues at hand. Regional cooperation is the best solution.

Q - Hudson Oaks: Is TWDB looking at the broader picture of the State/North Texas as a whole?

TWDB: Yes. We are looking at regional solutions through the vehicle of Senate Bill 1. There are wide variations in opinion as to the best approach.

Q - Willow Park: Are we considering the availability of grants to fund the recommended improvements?

A - JKC: SRF loans will be the primary source of funding. Some other small grants may be looked at. This issue is beyond the scope of this study, but will be the next step in the process.

A - TWDB: The chances of getting grant money after this study are small. Some options include CDBG and Farmer's Home System. Farmer's Home is not a recommended alternative because this area will be mostly urbanized.

JKC: Recognized additional participants in attendance at the meeting:

Sam Brush - NCTCOG

James Dickason - City of Weatherford

Lee Bradley - City of Fort Worth

Wayne Owen - Tarrant Regional Water District

TEAGUE NALL AND PERKINS
INC. ENGINEERS • SURVEYORS • MUNICIPAL CONSULTANTS

August 11, 1998

City of Aledo
200 Old Annetta Road
P.O. Box 1
Aledo, Texas 76008
Attn: Bob Lewis, Mayor

RE: Second Public Meeting Summary
SE Parker County Water Study
TWDB Project No. 98-483-246
TNP Project No. PCU97237

Dear Participant:

Thank you for your interest in the Southeastern Parker County Water Study. The second public meeting (50% study completion) was held on Tuesday, August 4, 1998 at the City of Willow Park City Hall. If you were able to attend the meeting, your time and effort were greatly appreciated. The number of people in attendance, along with the number of questions asked during the meeting, are evidence that the topic of water is a high concern to many this hot and dry summer.

For your information and record, the following are included:

1. Press Release available at the meeting.
2. Sign-up sheet from the meeting.
3. Copy of the slide presentation.
4. Overview of questions and answers

Please note that only one copy of this information has been sent to each entity, so please post this information or route it to your councils, commissioners, members or others that you know have an interest.

We urge you to stay involved in the study process and to attend our final meeting which should be held sometime in October. We will send more information as the meeting date approaches. Should you have any questions, comments or information to provide us for the study, please feel free to call Kelly Dillard or me at (817) 336-5773. Again, thank you for your interest and participation.

Sincerely,
TEAGUE NALL AND PERKINS, INC.



J. Kelly Carta, P.E.

e-mail: kcarta@tnp-online.com
kdillard@tnp-online.com
Enclosures: Meeting Summary Packet

915 FLORENCE STREET
FORT WORTH, TEXAS 76102
(817) 336-5773
FAX (817) 336-2813

PRESS RELEASE

(For Immediate Release)

Southeastern Parker County Water Study

On Tuesday, August 4, 1998 at 7:00 p.m., a public meeting was held at Willow Park City Hall to discuss the on-going water study to look at water needs for southeastern Parker County during the next 30 years. This meeting was the second of three public meetings for the study. The purpose of the meeting was to discuss preliminary findings at the mid-point of the study process and solicit public comment and discussion related to the alternatives presented at the meeting.

The study was commissioned by the Parker County Utility District Number 1 in the spring of 1998 at the request of the sponsors, who include the Cities of Willow Park, Aledo, Hudson Oaks and the County of Parker. The funding for the sponsors was matched by a grant from the Texas Water Development Board making the study possible. The study covers southeastern Parker County and is generally bounded by White Settlement Road on the north, the County Line on the east and south, Hwy 171 on the southwest and Weatherford on the west. The study includes the cities of Willow Park, Hudson Oaks, Aledo, Annetta North, Annetta and Annetta South, as well as unincorporated areas within the limits.

Teague Nall and Perkins, Inc. (TNP), a civil engineering firm in Fort Worth, was retained to perform the study. Kelly Carta, P.E. and Kelly Dillard, P.E. of TNP made the presentation and discussed the preliminary findings.

The key issue in the study is the ability of the cities in the southeastern Parker County area to meet water demands as the area population continues to grow. These issues have been highlighted this summer as drought conditions caused most cities and water systems to, at times, issue some form of water rationing. Water for fire fighting has also become a major concern during the past few weeks.

Kelly Carta gave a quick overview of how the analysis has been performed, including methods for projecting area growth, determining future water demands, possible alternatives to meet demands, project phasing and costs. Mr. Carta reminded the attendees that the meeting represents the 50% completion phase of the study and that some of the later elements are still being completed and refined. He also noted that the study is intended to look at needs for approximately the next 30 years. In addition, Mr. Carta explained some of the criteria and constraints used in the study.

Mr. Carta noted that all water for the area currently comes from well systems. He reviewed comments from the first public meeting (which was held in April at Hudson Oaks) showing that the continued use of wells has a number of drawbacks. These included the large number of wells that would be required to meet demands, the land requirements that could be needed for each well, the increase in costs to drill and operate wells as deeper formations are required, and the prospect of future groundwater contamination. In short, the continued use of wells was shown not to be a viable long term solution to meeting regional water demand.

Secondly, Mr. Carta discussed the option of purchasing treated water. The only currently available public sources practical for this option would be to purchase water from either the City of Weatherford or the City of Fort Worth. Correspondence generated during the course of the study indicates that the City of Fort Worth is currently trying to meet commitments already in place and is not interested in serving areas of Parker County outside of their extra-territorial jurisdiction (ETJ) at this time. Weatherford currently does not have a supply which will allow them to serve the study area and Weatherford's contract with TRWD to purchase water out of Lake Benbrook prevents them from wholesaling water purchased from TRWD.

The remaining option identified in the study was for the cities to purchase raw surface water and treat it. The study area is in the Trinity River basin and has been assigned to Area C (Upper Trinity Region) under

Senate Bill 1. The available raw water supplies for the study area are controlled by the Tarrant Regional Water District. TRWD (formerly Tarrant County Water Control and Improvement District Number 1) was created in the early part of the century to address flooding problems in Tarrant County. It was later expanded to include water supply (primarily to Fort Worth) and began to administer surface water availability in area lakes. Currently TRWD operates supplies in Lake Benbrook, Eagle Mountain Lake, Lake Bridgeport, and others. In recent years, TRWD has also obtained supplies from Richland-Chambers Reservoir and Cedar Creek Reservoir. Supplies from these lakes are sent to Fort Worth's Rolling Hills water treatment plant and to Lake Benbrook. This effectively makes Lake Benbrook a constant level lake and the site of choice for the study area to obtain raw water.

The remaining issues are the purchase of raw water, transportation and treatment of raw water and then the distribution of the treated water to area water providers. Past experience shows that these types of operations can be most effectively performed by a larger entity, such as a regional entity like Parker County Utility District #1 (PCUD#1) or Tarrant Regional Water District. Tarrant Regional has expressed an interest in contracting with area entities to sell/purchase raw water. Treatment could be done with a number of treatment plants or a single regional treatment facility. Since there is effectively a single source and water pipes must be run to each city, the piping needs would basically be fixed regardless of where along the system treatment plants were placed. Mr. Carta showed cost graphs indicating that multiple plants would be more expensive than a single plant for a number of reasons. Therefore, a single regional plant is preferred at this stage of the study. Due to geography, the optimum location would be near the top of the hill to the north or northeast of Aledo.

To date, the study shows that water demand in the study area will grow rapidly during the next thirty years, requiring significant upgrades to the existing systems. Also, the technical aspects of the project are possible from an engineering and construction standpoint. However, the full costs for implementing a complete system from Lake Benbrook to the client cities would result in prohibitively high water bills to customers. Therefore, the remainder of the study will focus on methods to install the needed facilities at reduced costs.

Costs could possibly be reduced by adjustments to project phasing. However, any significant reduction in costs will most likely require cooperative agreements with larger entities. One transportation option would be for a regional entity to place a plant along the raw water line proposed by Weatherford and work with Weatherford to share costs on a single line from Lake Benbrook to the plant. Both entities would purchase raw water directly from TRWD but could both benefit from cost sharing for this portion of line. Another option would be for the cities of the area to approach TRWD and ask for delivery of raw water to the plant to be included in the unit costs for raw water and allow TRWD to construct the raw water line. Although, neither TRWD or PCUD#1 treat water at this time, it might also be recommended that the beneficiary cities approach TRWD or PCUD#1 about the possibility of participation in treatment as well. It was mentioned that addressing these issues would involve negotiations between all involved parties.

In conclusion, the participating cities were asked to formalize in the near future their preferences for ownership of future transmission and treatment facilities and whether they would be interested in formally approaching Parker County Utility District Number 1, the City of Weatherford and/or Tarrant Regional Water District for participation in the project.

The study is scheduled for completion in late fall of this year. The third, and final, public meeting will be held just prior to formal completion to discuss final study results and recommendations. Notification will be sent to study participants and the local papers regarding the date and time of the final meeting.

Sign-In Sheet
 Southeastern Parker County Water Study
 Second Public Meeting
 Willow Park City Hall
 7:00 p.m. - August 4, 1998

	Name	Representing	Phone #	Fax #	E-Mail
1	Kelly Dillard	League Nally Perkins	386-5773	386-2813	kdillard@trp-online.com
2	CURTIS Johnson	TX WATER DEV. Bd	572 463-8666		
3	Kim Sander	Weatherford/Hok Hollow	596-4661		
4	Robyn Adams	Community News	294-8389	same	rschmidt@flash.net
5	Wayne Owen	TRWD	335-2491	877 5137	Wover@trwd.com
6	JOE WEBER	ALEDO RESIDENT DEMO PARTY CANDIDATE CO. COMM PET 4	441-8255		
7	GENALD LIERT	WILLOW PARK	596-7479		GFLJUL@AOL.COM
8	Bob & Carolyn Holling	Weatherford	599-5721		
9	C GUY WATACE	CWP	441-7108	441-6900	
10	JAMES DAVIS	WILLOW PARK GUYCORELL P-3	441-8977		
11	Robert B. + Maxine Alford	316 scenic trail	441-8371		
12	DAVID BELSTING	WEATHERFORD	599-0460		

	Name	Representing	Phone #	Fax #	E-Mail
13	James Dubeau	City of Weatherford	598-4250	598-4138	James 9833 @AOL.COM
14	JAMES L. DOSS	WILLOW PARK, P & Z	441-7104		
15	LES COOLEY	LL MAYOR	441-2108	441-6900	
16	Bill Sallee	Sallee Land Corp	596-9852		
17	Arnold Hobbs	Highland Water Supply	594-5050		
18	W.A. Carpenter	Highland Water Supply	594-4569		
9	GENE L. VOYLES	HUDSON OAKS	341-3170	—	—
20	FARREST THOMPSON	HUDSON OAKS	594-1583		
21	Pail Hoy	Hudson Oaks	596-4223		
22	Garren Cooley	Willow Park	341-4411		
23	Joe Sydon	Willow Park	594-8478		
24	Gary Shrage	Weatherford	594-2116		
25	DORIS EICH	Willow Park	441-8900	441-6610	
26	ROY RAMOS	Willow Park	441-9197		
27	JERRY BURKS	WILLOW TX. - HUDSON OAKS	613-9811		

	Name	Representing	Phone #	Fax #	E-Mail
43	B.W. Higdon	Willow Park	596-1571		
44	Sue E. Higdon	"	"		
45	BOB LEWIS	ALEDO	441-7014	441-7520	mayorbob@flash.net
46	A G SWAN	PCU # 1	220 5585	220 5585	
47	JIM THORP	Parker Co Treasurer	598-6150	598-6180	moneyman@Flash.net
48	MARK RILEY	Rep. Cand. County Judge	596-7456		
49	DONNIE COLE	Hudson Oaks	596-8902		
50	Lloyd STAFFORD	STES	441-7533	441-1128	
51	ROBIE ELLIOTT	WEATHERS DEMOCRAT	554-7447		
52	Rene Peden	Parker County	596 0004	5945176	
53	EMERA JOHNSON	COUNTY	596-5202		
54	Doug Hughes	P.C.U.D no 1	(817) 523-1031	(817) 379-5036	
55					
56					
57					

	Name	Representing	Phone #	Fax #	E-Mail
28					
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Southeastern Parker County Water Study

SECOND PUBLIC MEETING

Funding By
The Texas Water Development Board,
The Cities of Willow Park, Aledo and Hudson Oaks
and the County of Parker

In Association with
Parker County Utility District Number 1

50% COMPLETE STATUS MEETING

- Presentation of findings
- Discussion of methodologies
- Discussion of alternatives
- Discussion of unresolved issues

Background History

- Study funded by a Texas Water Development Board Grant through PCUD#1 with matching costs by Willow Park, Hudson Oaks, Aledo and Parker County
- Application prepared Fall, 1997 at the request of the funding cities and Parker County
- Introduction Meeting (first public meeting) held in April, 1998 at the City of Hudson Oaks
- Study performed by Teague Nail & Perkins

Study Boundary Map

Where Are We Now?

- TWDB Grant application completed in Fall, 1997; formally executed in February, 1998
- Data acquisition and First Public Meeting in April, 1998
- Development of service options and 50% Completion Public Meeting (Current Phase)
- Final report and Final Public Meeting planned for late Fall, 1998

What Does The Study Do?

- Evaluate and determine the most feasible alternatives to meet water supply needs for the next 30 years
- Estimate costs associated with implementing feasible alternatives
- Identify potential institutional arrangements to provide water supply services

How Was the Analysis Performed?

- Projected population trends
- Projected entity boundary growth trends
- Determined existing well supplies
- Determined annual water demand projections through duration of study
- Analyzed alternatives to meet demand
- Determined cost and phasing

Population Trends

- Plotted historic data from census for even decades
- Plotted growth estimates and projections since 1990 from Census Bureau, TWDB, NCTCOG, Cities self-reporting
- Reviewed demographics
- Generated representative projection growth rates based on available data
- Calculated future populations based on projected growth rates

Entity Boundary Growth Trends

- Plotted existing city limits
- Plotted existing potential ETJ limits
- Projected future ultimate growth boundaries
- Cities assumed to increase city limit area at 10% per year until boundary reached

City Limits Map

ETJ Map

Existing Well Supplies

- Sent questionnaire to each city and CCN provider in the study area
- Received completed questionnaires from major cities and several CCN providers

Annual Water Demands

- Annual demands for each entity determined based on annual population projections
- Design criteria:
 - 3 persons/connection
 - TNRCC mandated 0.8 gpm per connection for plant and pipe sizing
- Demand determined using two different scenarios:
 - Continued use of wells with treated surface water augmenting existing supply
 - Treated surface water serves all water demand

What Have We Learned?

- Existing conditions
- Alternatives for the future
- Estimated phasing schedule

How Do We Get Our Water Now?

- Individual Wells
- Private Well Systems
- Municipal Well Systems

ALL CURRENT WATER SUPPLIED BY WELLS

What Are Our Choices?

- Continued use of wells
- Purchase of treated water
- Purchase and treatment of raw water
- Combination of all of the above

Alternatives to Meet Demand

■ Wells

- Approximately 276 additional wells needed by 2030
- Each well heavily restricts 2 acres of land (well head easement)
- Each well could potentially impact up to 18 acres of land

■ Treatment Plant

- 12 mgd treatment plant needed by 2030
- Service areas include Hudson Oaks, Willow Park, Aledo, all three Annettas, Unincorporated Highway 377 corridor, minimal service to areas in Fort Worth ETJ
- It is assumed that Fort Worth will annex the majority of their ETJ and serve the area from the east

ALTERNATIVE 1 Continued Use of Wells

- Addressed in April Meeting
- Land requirements significant with continued urbanization
- Wells must be drilled deeper for continued production - greater expense to drill and operate
- Availability of groundwater questionable with increasing number of wells
- Urbanization and increased number of wells increases chances of groundwater contamination
- **SUMMARY: LONG TERM USE OF WELLS NOT RECOMMENDED**

ALTERNATIVE 2 Purchase of Treated Water

- Local public sources are City of Weatherford and City of Fort Worth
- City of Weatherford currently does not have sufficient raw water supply and does not feel they have capacity to provide service
- City of Fort Worth does not plan to serve any of Parker County outside their existing Extra-Territorial Jurisdiction (ETJ)
- TRWD does not currently provide treated water, but indicated that they would entertain discussions with beneficiaries if the need arose
- **SUMMARY: TREATED WATER IS NOT CURRENTLY AVAILABLE FOR PURCHASE**

ALTERNATIVE 3 Purchase & Treat Raw Water

- Study area is in the Trinity River basin
- Senate Bill 1 groups all of Parker County into Area C, the Upper Trinity Area
- Available nearby sources are controlled by TRWD
- TRWD sells raw water to Fort Worth and will soon sell to Weatherford for treatment
- TRWD operates water reserves in Benbrook, Eagle Mountain and Bridgeport and other lakes
- TRWD pumps East Texas water to Lake Benbrook from Richland-Chambers and Cedar Creek reservoirs
- TRWD has expressed an interest in supplying raw water (and possibly treated water) to the study area
- **SUMMARY: RECOMMENDED OPTION IS TO PURCHASE AND TREAT RAW WATER FROM TRWD**

Treatment and Distribution Systems

- Each City operates its own individual plant
- Groups of Cities jointly operate multiple plants
- One regional plant serves the entire southeastern Parker County study area

Regional vs. Individual Approach

- None of the cities in the study area currently has treatment facilities and most do not have in-house staff qualified to operate such facilities
- Aledo, Hudson Oaks, Willow Park and the private water utilities have existing storage and distribution infrastructure
- Multiple plants result in higher cost for smaller facilities, increased expenses for land purchase and duplicity in O&M costs
- Whether the choice is one or multiple plants, an interlinked pipe network for water will be required

Typical Treatment Plant Costs Graph

One Regional Plant

- Reduces property acquisition costs
- Reduces O&M
- Allows for construction economies of scale
- Allows for single point of contact with regulatory agencies on treatment issues
- Regional plant wholesales to cities and private utilities who can keep their existing billing and distribution systems
- Cities and private suppliers would not have retail competition from a wholesaler

Regional Treatment Plant Ownership Options

- Coalition of member cities (i.e. creation of a new district, etc.)
- Tarrant Regional Water District (does not currently own or operate a treatment facility)
- PCUD #1
- Other

Construction by Phase

- 2002
 - Very optimistic construction schedule
 - 36" Raw water line construction from Lake Benbrook to Plant site in Aledo (joint venture with Weatherford)
 - Construct 2 mgd plant
 - Construct distribution lines to Aledo, Willow Park, and Hudson Oaks
- 2012
 - Add 4 mgd to water plant (6 mgd total capacity)
 - Extend distribution lines to Annetta and Annetta South (Deer Creek Estates)
- 2020
 - Add 8 mgd to water plant (12 mgd total capacity)
 - Upgrade existing distribution lines to the south side of Aledo, Willow Park and Hudson Oaks
 - Extend distribution lines to Annetta North and Bluebonnet Hills area (Hwy. 377)
- 2030
 - Add 6 mgd to water plant (18 mgd total capacity)
 - Upgrade connections to Aledo and Annetta
 - Extend lines to Fort Worth North and South fringe areas

Distribution Phasing Map

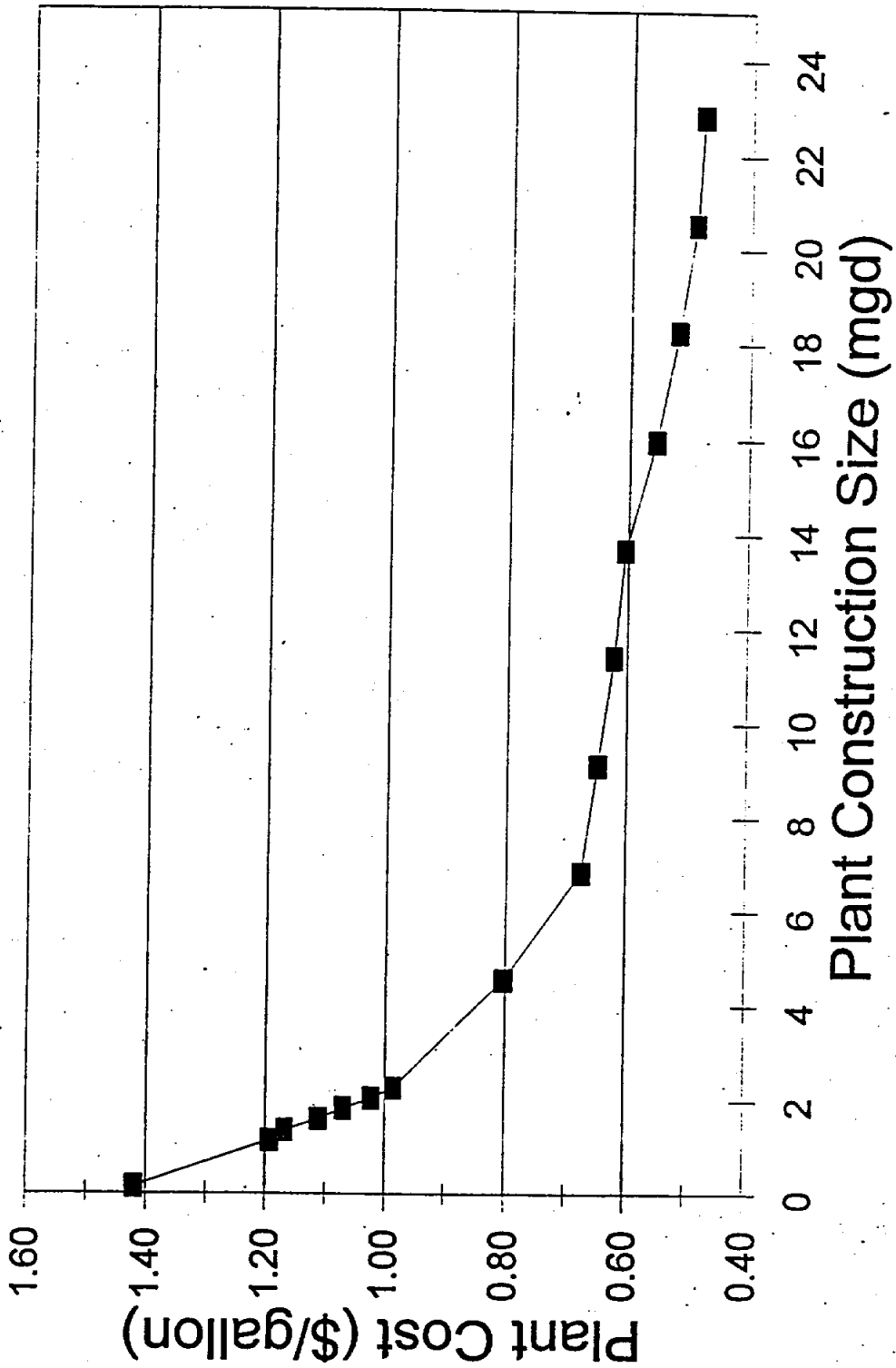
Water Plant Demand Curve

Unresolved Issues

- **Do any of the Cities prefer to have their own plant?**
- **Do any of the Cities wish to participate in a regional plant?**
- **How seriously would TRWD consider the construction of raw water facilities to serve the area or the treatment of water for wholesale to the area?**
- **Will Weatherford be willing to joint venture for construction of a transmission line from Lake Benbrook?**
- **What are the water plant and transmission line ownership and maintenance preferences of the client cities?**

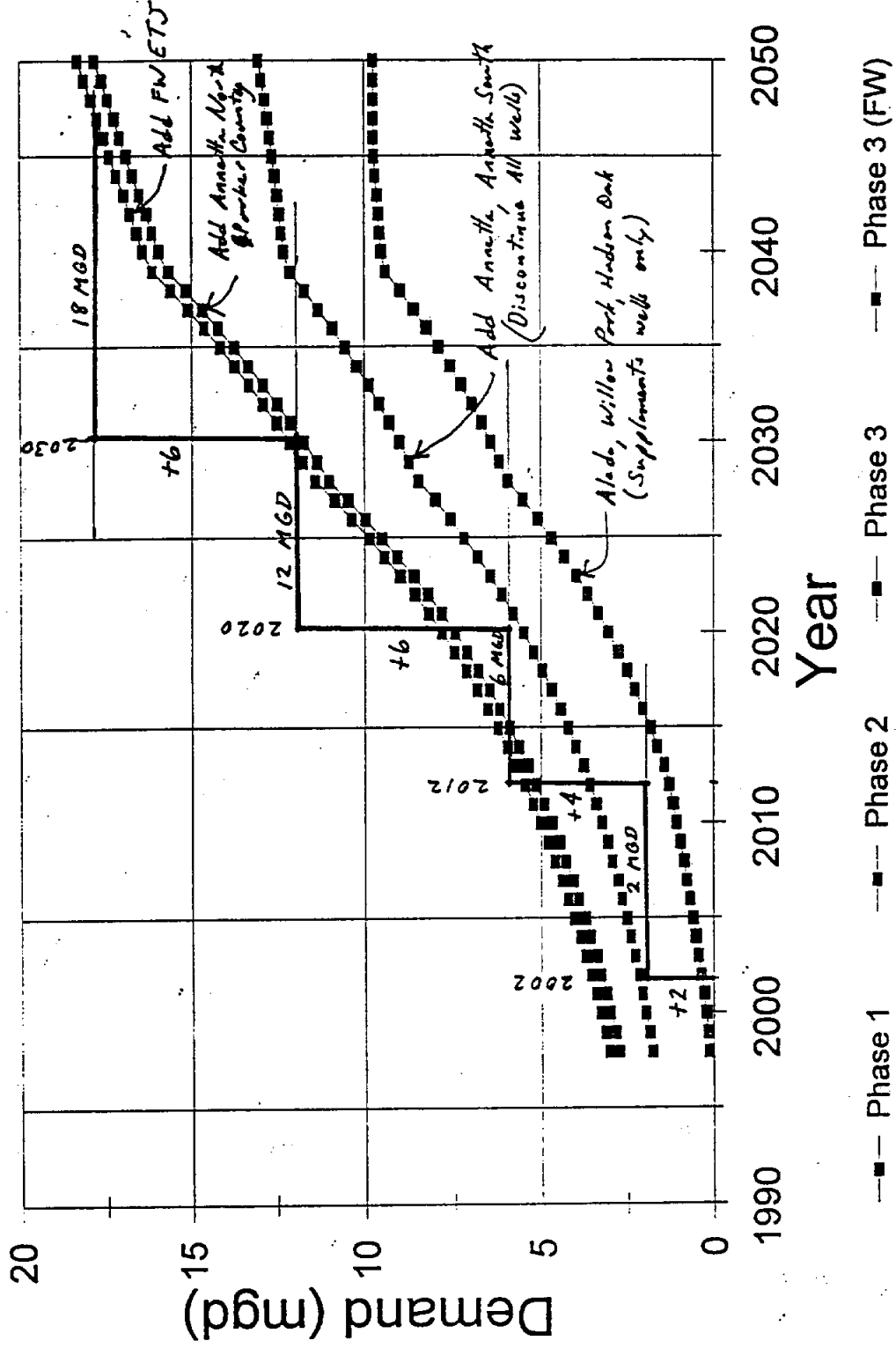
Typical Treatment Plant Costs

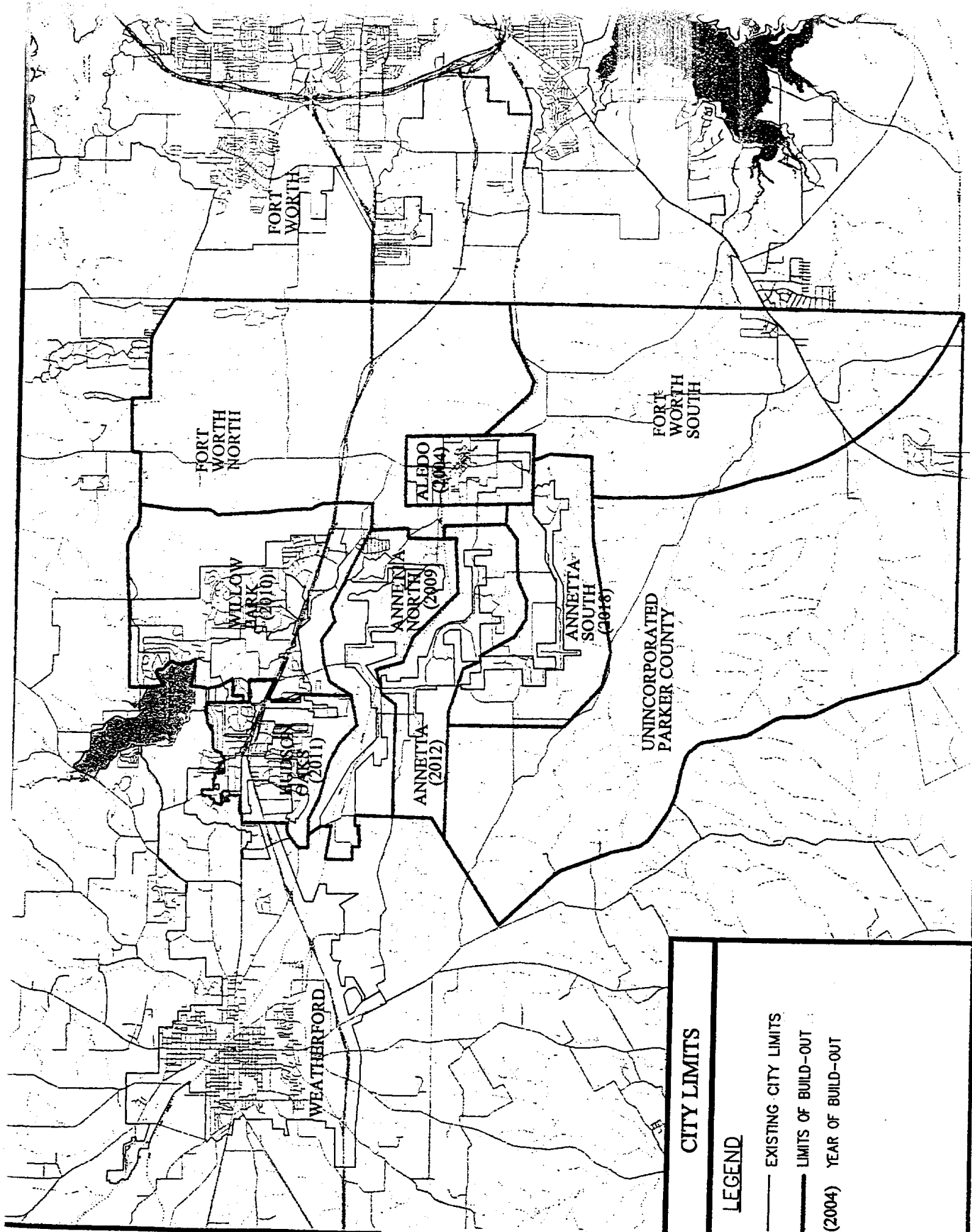
Based on James M. Montgomery and Others



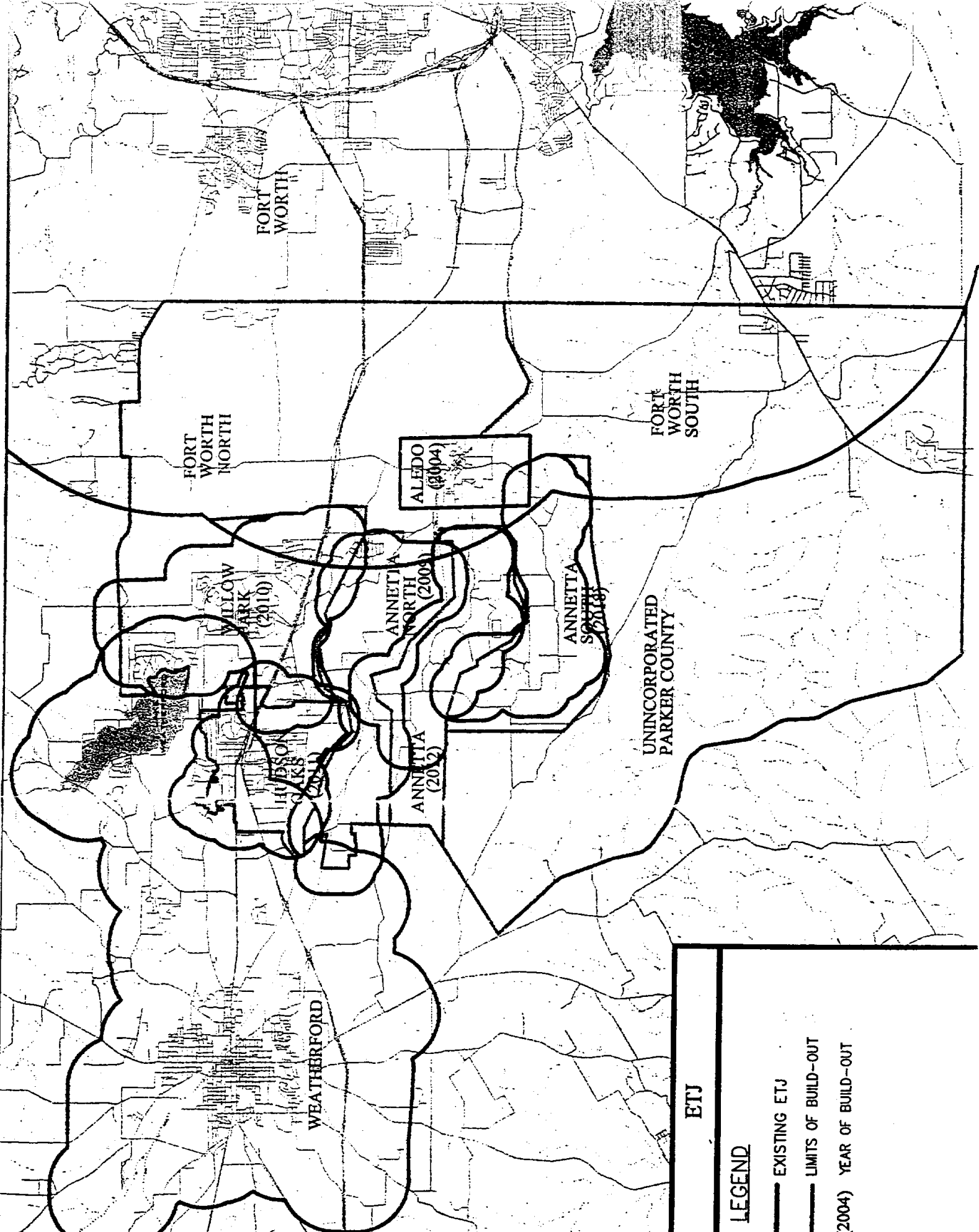
Water Plant Demand Curve

Southeastern Parker County





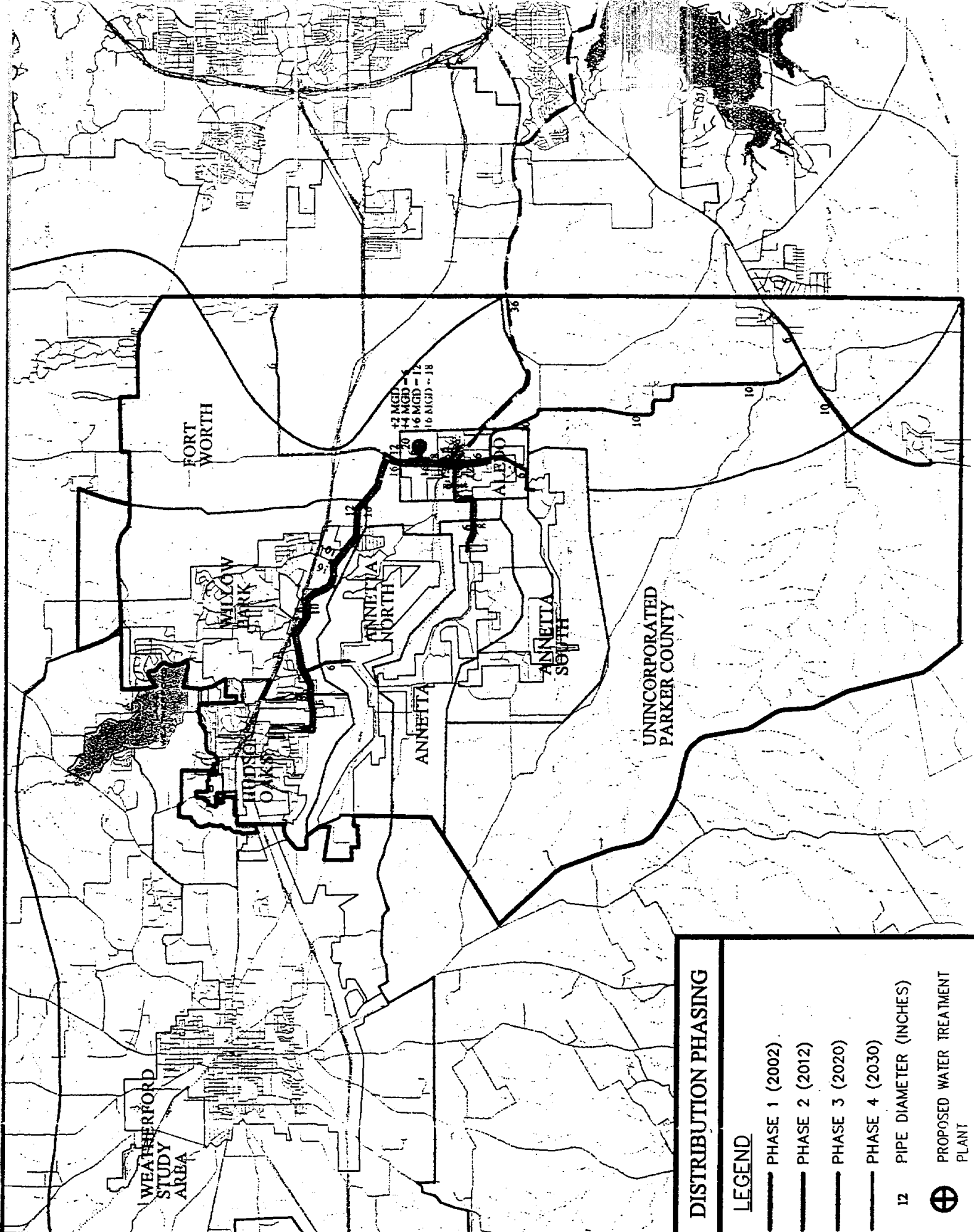
CITY LIMITS	
—	EXISTING CITY LIMITS
- - -	LIMITS OF BUILD-OUT
(2004)	YEAR OF BUILD-OUT



ETJ

LEGEND

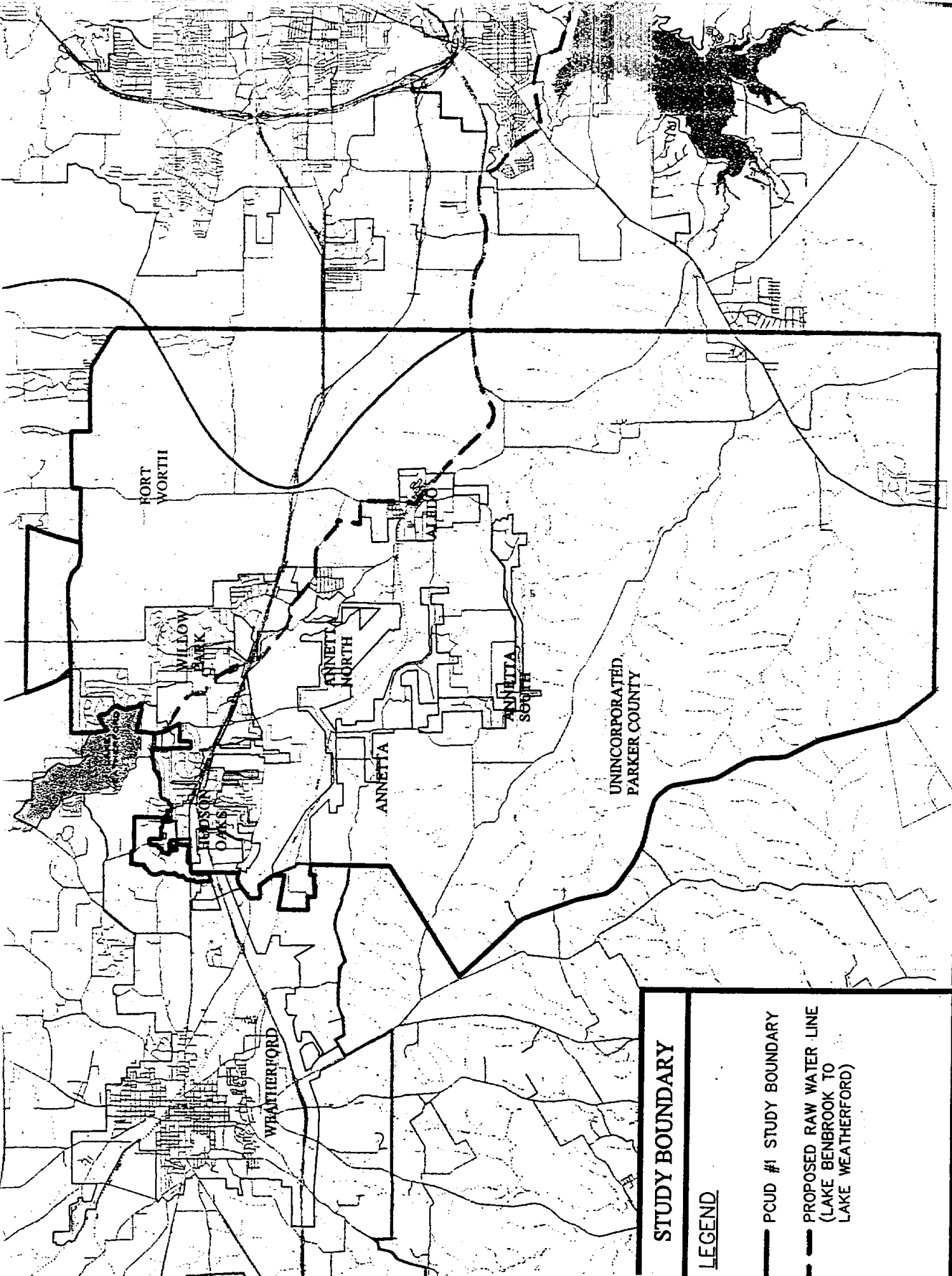
- EXISTING ETJ
- LIMITS OF BUILD-OUT (2004)
- YEAR OF BUILD-OUT (2010)



DISTRIBUTION PHASING

LEGEND

- PHASE 1 (2002)
- PHASE 2 (2012)
- PHASE 3 (2020)
- PHASE 4 (2030)
- 12 PIPE DIAMETER (INCHES)
- ⊕ PROPOSED WATER TREATMENT PLANT



STUDY BOUNDARY

LEGEND

- PCUD #1 STUDY BOUNDARY
- - - PROPOSED RAW WATER LINE
(LAKE BENBROOK TO LAKE WEATHERFORD)

PCUD #1
SOUTHEASTERN PARKER COUNTY WATER STUDY
PUBLIC MEETING NO. 2
WILLOW PARK COUNCIL CHAMBERS

August 4, 1998
7:00 p.m.

MEETING SUMMARY

Kelly Carta (JKC) of Teague Nall and Perkins (TNP) opened the meeting with a welcome and brief introduction. A list of meeting attendees is attached to this summary. JKC made a presentation of the project status, including its history, goals, results obtained to date, and list of alternative solutions. A copy of the overhead projector slides used in the presentation are included as part of this packet. After the slide presentation, JKC opened the meeting up for a question/answer session. Below is an overview of the session.

Q: Is it cost effective to construct a 2 MGD water plant and stage upgrades, or would it be more efficient to start with a larger plant such as a 6 MGD plant?

A - JKC: We are currently looking at ways to reduce front-end costs of infrastructure (plant, piping, etc.) to make the project financially feasible. At the present time, the initial cost of construction for anything larger than a 2 MGD plant appears to be cost prohibitive (given the amount of transmission pipe which must be constructed at the beginning).

Q: Can this area tie on to Weatherford's raw water line. What stage of construction is the line in?

A - JKC: The route for the line has been set, easements have been acquired along the entire route, the intake structure has been constructed at Lake Benbrook, a 36" main has been constructed from the intake structure to the City of Benbrook city limits. A pump station has been built, but no pumps have been installed. The line is sized to serve Weatherford well into the foreseeable future. The line is a raw water line only and water must still be treated. Weatherford's agreement to purchase water from Tarrant Regional Water District (TRWD) precludes them from selling the water to anyone else. Weatherford might be willing to share the capacity in the line with another entity who has purchased water from TRWD (i.e. this southeast Parker County area) in exchange for cost sharing on construction of the line.

Q: Isn't the pump station already complete?

James Dickason: The booster pump station at the Benbrook City limit has been constructed, (City of Weatherford) but does not have pumps.

JKC: The State is focusing its efforts on regional approaches to water and sewer

issues. They prefer dealing with a regional entity rather than each individual city, especially for the purpose of borrowing State Revolving Funds (SRF) for construction of these facilities. Even this present study required regional cooperation in order to obtain the attention and approval of the Texas Water Development Board (TWDB).

Q: Why wouldn't Weatherford want to serve this area with treated water?

A - JKC: Weatherford doesn't have the capacity to serve this area from Lake Weatherford. Their contract with TRWD prevents them from selling any of their supply from Lake Benbrook. The area would be better served to focus on going directly to TRWD to request capacity and even possibly for assistance in construction of the raw water main and plant facilities.

Q: TRWD has already indicated that water is available for purchase. If Weatherford already has a 36-inch line, what size line would be needed to serve this study area in addition to Weatherford into the future, taking into account the projected growth in both areas?

A - JKC: Weatherford's 36-inch line has much more capacity than they need for well into the future. Our calculations indicate that a 36-inch line can serve both Weatherford and southeast Parker County, including their projected growth to 2040. In fact, Weatherford is planning to construct a 24-inch line from Benbrook to Lake Weatherford to eliminate unnecessary expense.

James Dickason: The 24-inch line is projected to serve Weatherford through 2060.

Q: Why not build larger than a 36-inch to provide more than enough capacity?
A - JKC: Building a larger line removes the financial benefit that could be achieved by sharing the cost of facilities that are already constructed. The 36-inch line adequately serves the area beyond the 30-year study period, which is as far as demand and needed sizes can comfortably be projected.

Q: Is it realistic to say that the results of the study indicate that this area must purchase treated water from someone?

A - JKC: The study indicates that we need to find some way to begin moving toward surface water supply and away from well supply. However, at the present time, there is no treated water readily available.

Q: It sounds as though the cities, as they exist today, cannot afford to construct treatment facilities. Don't we need to purchase treated water from someone?

A - JKC: We must find an entity to treat the water. Whatever that entity may be, the cost of the facilities must be able to be paid from the rates charged to these customers.

Q: Shouldn't we go ahead and buy raw water because it has to be treated again at the meter for effluents?

- A - JKC: These are two separate issues. Treatment of effluent is only an issue in wastewater plants. This study is related to treatment of clean water to make it potable. Several years ago, the Parker County Economic Development group identified water, wastewater and transportation as priority issues which need to be addressed. Water was identified as the highest priority of all the issues, however, wastewater will certainly follow quickly.
- Q: What size line is needed to serve the 18 MGD demand in 2050? Is the 36-inch main adequate?
- A - JKC: From our initial calculations, yes.
- Q: Would a 6 MGD plant serve today's needs?
- A - JKC: Yes, it would serve the entire study area, but the cost would be prohibitively expensive and that is more capacity than is needed at this time.
- Q: Would it be adequate in a peak time like this summer?
- A - JKC: The size of the plant was calculated at the State required minimum, 0.6 gallons per minute per connection, using 3 persons per connection. This amount includes a peak day factor but does not include a peak hour factor. Demand values in the study would need to be multiplied by a factor of 1.5 to 2 for peak hour. However, the additional demand produced by a peak hour is generally attenuated by the entity's storage facilities (ground and elevated). Those storage facilities are the responsibility of each individual city or water utility and are beyond the requirements of this type of regional system.
- Q: Are the staged upgrades to the plant in standard sizes?
- A - JKC: There are not really "typical" or "standard" upgrades for plants of this sizes. The upgrades shown were determined by trying to evenly space upgrades throughout the study period.
- Q: Where is the economic break even point?
- A - JKC: We are currently looking at that and we are having a hard time finding an acceptable economic solution.
- Q: Does the plant include elevated storage?
- A - JKC: No. This is a basic gravity feed system from the plant which is proposed to be located on the ridge near the northeast corner of Aledo. Elevated and most ground storage are the responsibility of each individual city or water utility.
- Q: Is Weatherford's easement big enough to add an additional line?
- A - JKC: Yes, but Weatherford intends to use that space to upgrade their line at some point in the future. Any venture with Weatherford would include cost sharing to repay them for the capacity used in their pipe system and use of their easement.

Q: To clarify, one option is cost sharing with Weatherford for the raw water line from Lake Benbrook to the treatment plant near Aledo. Any cost for the distribution lines from the treatment plant to the member cities would not be shared with Weatherford. Is this correct?

A - JKC: Yes.

Q: Weatherford currently has an 8 MGD plant, this area appears to need between 2 and 6 MGD. Won't this tax the 36-inch line almost immediately?

A - JKC: Our calculations indicate that the 36-inch raw water line will be adequate to serve the study area and Weatherford, including expected growth in both areas through the year 2040. Lake Weatherford is currently meeting the demands of the City of Weatherford, therefore all of Weatherford's water supply is not expected to come through the 36-inch line.

Q: When is Weatherford planning to begin using the 36-inch raw water line?
A - JKC: We do not know for sure. It is our understanding that it is still sometime in the future. However, certain trigger events, like dry weather or demand thresholds will dictate the completion schedule.

Q: Does Weatherford have a positive attitude about joint venturing on this project?

A - JKC: It is our understanding that they have expressed tentative interest in working with this area through TRWD. They need to be officially approached and asked for their position, however.

Q: Would this area be in a position to serve other entities in the region with treated water?

A - JKC: Mr. Carta described growth trends in Weatherford and Fort Worth since the 1950s. He indicated that Fort Worth had originally planned to move this direction aggressively, however, their focus has shifted to North Fort Worth. That is why a regional entity is needed to come in and serve this area. Initially, it would only be economical for the plant to service its immediate region, however, and would not likely serve other areas with treated water. However, a large portion of Fort Worth's ETJ exists in the study area and some portion of this could be served from the new plant.

Q: If areas agree to cooperate and the 36-inch raw water line is shared with Weatherford, should the next line be constructed out of Eagle Mountain Lake when additional capacity is needed, rather than placing a parallel line from Benbrook?

A - JKC: No. Benbrook is the closest source. In addition, it is going to be used as a leveling lake by TRWD and kept at a relatively constant elevation because it is being fed from large reservoirs in the east. Therefore it is predicted to be the most reliable water supply source, even during extreme dry periods.

The Eagle Mountain series of lakes, at this time, does not have this type of constant supply.

Q: Is TRWD difficult to work with?

A - JKC: No. They have indicated that they are interested in providing raw water to this area. They have no history with providing treated water and would need to be officially approached for that type of service, if this desired.

Q: How much of this project is related to politics? Will the politics of the project change with political elections?

A - JKC: To some extent yes.

Q: Again, does this area want to become a regional treated water provider to other areas?

A - JKC: This is a possibility. In the future, this treated water supply could be an alternative for other areas in the immediate region. (i.e., remainder of Parker County needing water)

Q: If TRWD won't let Weatherford sell water to this area, why would they let this area sell to others?

A - JKC: Good point. However, TRWD has allowed both types of contracts in the past and this would be a point of negotiation, dictated to some extent by politics.

Q: How would the tax burden of this plant compare with the tax burden of other plants?

A - JKC: Payment for the facilities would not be structured as a tax burden. It is anticipated that the project would be funded by borrowing money from the State Revolving Fund (Texas low-interest loans to construct needed infrastructure) and paid back through customer water rates. Currently, the rates that have been preliminarily calculated are prohibitively high. The focus of the rest of this study will be finding feasible alternatives and phases which will allow acceptable funding of these projects. It is this emphasis that leads us to believe we will need to look outside the area for larger entity's assistance and participation.

Q: Are dollar figures available for each of the phases shown?

A - JKC: Yes, but they are too preliminary for public presentation.

Q: Is there a break even point?

A - JKC: With the preliminary figures, we have not been able to make the project break even during the study period. This will be our next focus.

Q: What needs to be done to create a utility district to serve this area?

A - JKC: That is one alternative. If the member cities indicate that this is the

direction they wish to go, the study will focus in this area. At the time, existing regional entities provide a more likely alternative to make financing easier. Examples of regional alternatives include TRWD and PCUD#1.

Q: Will a financing alternative be part of this study?

A - JKC: Yes.

Q: Will individuals be purchasing from the regional entity or their own utility?

A - JKC: Regional entity wholesales to cities and water utilities. They in turn retail to the individual customer.

Q: Each city could have a different rate?

A - JKC: Yes, and probably will, due to different existing and future infrastructures and their own rate studies.

Q: Does the study address the number of wells in the area aquifers and the capacity of the aquifer?

A - JKC: Only enough to know wells aren't a feasible alternative for the future, and show a trend to diminishing returns over time.

Q: Who knows the capacity of the aquifer and when it will be used up?

A - JKC: When the aquifer is over pumped, such as now, it can be evidenced by the drawdown measured at individual wells and the measurable cone of depression surrounding developed areas. In the Dallas-Fort Worth area, this has been noted in both the Paluxy and Trinity formations. We do not know when, or if, the aquifers will go dry.

Q: Who does?

A - JKC: TWDB may have some reports related to that topic. However, this study only pursued the issue to the point that wells showed a diminishing return as population densities increased, thus indicating that some other source of water should be sought to enable continued development.

Q: Can the area support two additional 2000 lot developments?

K Dillard: The focus of this study is to bring a surface water system online before the existing underground supplies become inadequate.

Rena Peden: A developer has provided well logs indicating that the capacity of the existing aquifers is already reduced.

JKC: The drawdown shown on those well logs could be as much from the temporary dry conditions of this summer as from permanent drawdown due to overuse of the system. The cause is not known, nor is it within the scope of this study to determine how such factors are currently affecting the drawdown. It is sufficient for this study to note that draw downs are

already occurring.
Curtis Johnson: The study regarding the capacity of the aquifer is a very complex and detailed effort, and may or may not have been performed for the Trinity and Paluxy aquifers. In general, the better alternative is to focus on conversion to surface water than to try and quantify the remaining capacity of the groundwater.

Q: Does any governmental entity regulate the use of wells?
A - JKC: Well head easements are the only real control currently in effect in Parker County. These are enforced by the TNRCC and the local platting process.

Q: When will we know we don't have the capacity to support another subdivision with wells?
A - JKC: Approval is required for construction of a subdivision. As more wells are needed to serve an area, and drawdown is occurring, the wells will need to be larger and deeper and the cost will become increasingly greater. Senate Bill 1 may address this issue to some extent by setting statewide standards for drought response regarding water. Some counties have Underground Water Conservation Districts which can limit well pumping. However, historically, the regulation of groundwater has not been a popular idea in Texas.

Q: Will Parker County be a lesson for the rest of the state by having all of its wells go dry?
A - JKC: It is very unlikely that this will happen before the area switches to surface water. However, if it is going to happen before the conversion, it is probably already too late to prevent it. If the recommendations in this study are implemented, this should not happen. Growth and historical projections don't predict that the area will run out of water that soon.

Curtis Johnson: Well water is cheaper than surface water. If groundwater was readily available, Fort Worth and Weatherford would not have converted to surface water. Texas as a whole is generally moving to surface water. The cost of supplying surface water is increasing. The State suggests that the cities obtain as much surface water as they can afford right now, because the cost of supplying it is not going to get any cheaper.

Q: What do we do in the interim until the study recommendations are implemented?
A - JKC: Additional wells will undoubtedly have to be drilled before a surface water treatment plant comes on-line. That is why we have included well production as an initial water supply source, working in conjunction with the first phase of the plant. Hopefully, after the plant is constructed, no new wells will be needed and the existing ones can be phased out over time.

- Q: Do we need to get larger wells from the Trinity rather than drilling in the Paluxy again?
- A - JKC: The Trinity formation is a deeper aquifer and generally yields more water, than the Paluxy. It will be more expensive to construct because of the increase in depth, however the increase in production usually outweighs the increase in cost.
- Q: Kennedale has wells in the Trinity formation supplying 300-500 gallons per minute (gpm). Can we get that kind of production?
- A - JKC: Probably not. The aquifers in this area dip from northwest downward to the southeast. Therefore, as you go southeastward, the aquifers become deeper and generally have more water. Kennedale is in a deeper part of the aquifer. We are very close to the outcrop of both the Paluxy and Trinity formations, therefore the production in our area is more limited.
- Aledo: Aledo looked at drilling a well several years ago and did a cost benefit analysis on Paluxy vs. Trinity. In short, if you can get about 30% greater yield out of the Trinity, then a Trinity well is more cost effective. Aledo constructed a Trinity well which can produce over 100 gpm.
- Q: When is the final meeting?
- A - JKC: Probably some time in October. We will talk with the member cities between now and then to get a consensus on how they wish to proceed.
- Q: Would it be feasible, without politics, to serve this area with treated water from the City of Fort Worth or Weatherford in the interim?
- A - JKC: We have shown that this second best choice, behind wells, for serving this area. However, the treated water is not currently available. Weatherford does not have the capacity at Lake Weatherford to sell, and is legally prohibited from selling excess capacity from Lake Benbrook. Fort Worth has indicated that they do not currently have enough capacity to serve this area either.
- Q: Can the study recommendations stand without the support of Weatherford's participation?
- A - JKC: We are looking at that feasibility. We want to focus on a regional approach, including Weatherford, if that is the desire of the member cities. Our primary focus now is to determine the one option that meets a consensus with all of the member cities and then concentrate in that area.

TEAGUE NALL AND PERKINS
CONSULTING ENGINEERS

facsimile
TRANSMITTAL

to: Parker County Utility District #1, Al Swan 817-523-3179
City of Aledo, Bob Lewis/J.E. Fickett 441-7520
City of Willow Park, Les Cooley/Guy Natale 441-6900
City of Hudson Oaks, Gene Voyles/ Mary Jane Holybee/Forrest Thompson 596-8829
Town of Annetta, Pat Perry/Bruce Moore 441-5700
Town of Annetta South, Doug Koldin 441-9527
Town of Annetta North, Edward K. Hensley 441-6600
Parker County, Ben Long/Mark Riley/Rena Peden/Gary Plugge 598-6199
City of Weatherford, Tom McLaughlin/Ken Reneau/James Dickason 598-4115
City of Fort Worth, Bob Terrell/ 871-6134
Tarrant Regional Water District, James M. Oliver/Wayne Owen 877-5137
Texas Water Development Board, Curtis Johnson 512-936-0889
TNRCC, Sid Slocum 795-2946
Bluebonnet Hills WSC, Dede Grizzard
Treetop Utilities, Tom Crew 817-535-8647
Deer Creek Waterworks, Doyle Hanley 441-6605
Spring Valley Water Company, Eddy Daniel
Dyegard Water Company, Mike Dyer/ Tim Megard/Don Dickens 596-7490
Highland Water Supply Corp. V.M. Carpenter/ Don Dickens 596-7490
North Central Texas COG, R. Michael Eastland 640-7806
Central Texas Utilities, Billy Green/Debbie Key 237-9217
Abraxas Utility, Evelyn Freemon Farhood/Laura Farhood 498-4350
ST Environmental, Lloyd Stafford 441-6900
The Weatherford Democrat, Roger Elliott 594-9734
The Community News, Randy Keck 441-5419
The Azle News & Springtown Epigraph, Edwin Newton 238-
The Fort Worth Star Telegram,

from: J. Kelly Carta, P.E. and Kelly Dillard, P.E.
re: Third and Final Meeting, Southeastern Parker County Water Study
date: December 10, 1998
pages: 2, including this cover sheet.
project PCU 97237

PLEASE SEE ATTACHED.

915 Florence Street
Fort Worth, Texas 76102

Phone: (817) 336-5773
Fax: (817) 336-2813

NOTICE

For Immediate Release

Please Post or Publish

(Please distribute to interested board or council members, staff,
and other interested parties in your service area.

A press release giving additional information will be given
to the newspapers within the next week or two.)

The Parker County Utility District Number 1, Texas Water Development Board, County of Parker, and Cities of Willow Park, Aledo and Hudson Oaks invite all interested parties to:

What: Third and Final Public Meeting
Southeastern Parker County Water Study
Date: Monday, January 4, 1999
Time: 7:00 p.m.
Where: City of Aledo Council Chambers
200 Old Annetta Road
Aledo, Texas 76008.

The meeting will be held to present final findings related to future water supply sources, demands and distribution in the study area for the next 30 years. Options and costs for meeting the water demands during this 30 year planning period will be presented and discussed. Public comment from southeastern Parker County residents is encouraged. For additional information, contact Kelly Carta of Teague Nall and Perkins at (817) 336-5773.

915 Florence Street
Fort Worth, Texas 76102

Phone: (817) 336-5773
Fax: (817) 336-2813

Q:\PROJ-R14\pcu97237\docs\FAXMET3.wpd

TEAGUE NALL AND PERKINS
CONSULTING ENGINEERS

facsimile
TRANSMITTAL

to: The Weatherford Democrat, Roger Elliott 594-9734
The Community News, Randy Keck 441-5419
The Azle News & Springtown Epigraph, Edwin Newton 238-

from: J. Kelly Carta, P.E. and Kelly Dillard, P.E.
re: Southeastern Parker County Water Study
Final Meeting Summary
date: January 5, 1999
pages: 2, including this cover sheet.
project PCU 97237

PLEASE SEE ATTACHED.

915 Florence Street
Fort Worth, Texas 76102

Phone: (817) 336-5773
Fax: (817) 336-2813

PRESS RELEASE
(For Immediate Release)

Southeastern Parker County Water Study

The third and final public meeting for the Southeastern Parker County Water Study was held at the 7:00 p.m., January 4, 1999 in the Aledo City Hall. The focus of the meeting was to review and discuss the Preliminary Study Report submitted last week to the Texas Water Development Board (TWDB). During the meeting, the methodology, assumptions and alternatives considered in preparing the report were reviewed. The findings and recommendations of the study were presented and public comment was solicited. Interested parties have until January 22 to review the data and provide comment to Teague Nall and Perkins. Such input will be essential in generating the final version of the report which will be submitted to the TWDB in February.

The study was funded in part by the Cities of Willow Park, Hudson Oaks, Aledo and the County of Parker, with matching grant funding by the Texas Water Development Board. Parker County Utility District Number 1 administered the study conducted by the engineering firm of Teague Nall and Perkins, Inc.

Kelly Carta, P.E., presented the findings at the meeting and entertained questions related to the presentation. A summary of the items discussed is presented below. The study area includes the cities and towns of Hudson Oaks, Willow Park, Aledo, Annetta, Annetta North, Annetta South, portions of the Fort Worth ETJ within Parker County, and unincorporated areas of southeastern Parker County.

The study explored three options for providing water to retail service utilities in the southeastern portion of Parker County, Texas, during the next 30 years. The options included the continued use of groundwater (wells), the purchase of treated water from a neighboring entity, or the purchase and treatment of raw surface water. In addition, a review was conducted as to whether such options should be pursued individually by each city, by groups of cities or by a regional entity representing all cities/utilities in the study area. The positive and negative aspects of each option were discussed. Methodology and calculations were presented supporting the determination of future population densities and City boundaries, calculation of anticipated water demands, and approximations of cost.

In summary, this report suggests that the best option available, considering relevant factors, is for an existing regional utility entity to contract with the Tarrant Regional Water District (TRWD) for raw water. If possible, this entity should partner with the City of Weatherford in transporting the raw water. It would then need to construct a regional plant in the vicinity of the geologic ridge north of Aledo and provide wholesale treated water to member cities and utility providers within the study area. The first sales of treated water from this system will need to be available to the study cities within approximately 5 years based on current growth patterns and well water demands. The demand requirements and cost for such a system necessitates that it be constructed and upgraded in phases over the next 30 years. Two different phasing scenarios were presented, with variations in participating entities and the number of phases.

After the technical details of the report were presented, discussion centered on the actions needed to move to implementation of the recommendations. It was noted that the participant cities should next determine the best vehicle for a joint (regional) entity to carry out the technical recommendations. All entities in the process were encouraged to continue diligently working together to plan and meet water needs prior to problems such as those incurred during the heat wave and drought of last summer.

WELCOME

Southeastern Parker County Water Study

THIRD PUBLIC MEETING

Funding By
The Texas Water Development Board,
The Cities of Willow Park, Aledo and Hudson Oaks
and the County of Parker

In Association with
Parker County Utility District Number 1

Purpose of Meeting

THIRD AND FINAL MEETING

- Presentation of information being sent to Texas Water Development Board
- Recommendations for the Future

Background History

- Study funded by a Texas Water Development Board Grant through PCUD#1 with matching costs by Willow Park, Hudson Oaks, Aledo and Parker County
- Application prepared Fall, 1997 at the request of the funding cities and Parker County
- First meeting held April 29, 1998 and second meeting held August 4, 1998
- Study performed by Teague Nall & Perkins

Study Status

Where Are We Now?

- Study is complete except for incorporating review comments
- Preliminary Study sent to Austin. Copy given to primary entities
- TWDB comments due back in 30 days
- Final due back to TWDB in 60 days

The Study

What Did The Study Do?

- Evaluate and determine the most feasible alternatives to meet water supply needs for the next 30 years
- Estimate costs associated with implementing these alternatives
- Identify institutional arrangements to provide water supply services

The Study

We Need Water !!! Now What?

- Three Options - Groundwater, Treated Water, Raw Water
- Groundwater not reliable for long term
- Treated water not readily available
- Raw water available, but then what?

Option No. 1

Continued Use of Wells

- Land requirements significant with continued urbanization
- Wells must be drilled deeper for continued production - greater expense to drill and operate
- Availability of groundwater questionable with increasing number of wells
- Urbanization and increased number of wells increases chances of groundwater contamination
- SUMMARY: LONG TERM USE OF WELLS NOT RECOMMENDED

Option No. 2

Purchase of Treated Water

- Local public sources are City of Weatherford and City of Fort Worth
- City of Weatherford currently does not have sufficient raw water supply and does not feel they have capacity to provide service
- City of Fort Worth does not plan to serve any of Parker County outside their existing Extra-Territorial Jurisdiction (ETJ)
- TRWD does not currently provide treated water, but indicated that they would entertain discussions with customers if the need arose
- SUMMARY: TREATED WATER IS NOT CURRENTLY AVAILABLE FOR PURCHASE AND APPEARS TO BE AN UNLIKELY ALTERNATIVE

Option No. 3 Purchase and Treat Raw Water

- Available nearby raw water sources are controlled by TRWD
- TRWD sells raw water to Fort Worth and will soon sell the Weatherford for treatment
- TRWD operates water reserves in Benbrook, Eagle Mountain and Bridgeport Lakes
- TRWD pumps East Texas water to Lake Benbrook from Richland-Chambers and Cedar Creek reservoirs
- TRWD has expressed an interest in supplying raw water to the study area
- **SUMMARY: RECOMMENDED OPTION IS TO PURCHASE AND TREAT RAW WATER FROM TRWD**

Water Treatment Options Treatment and Distribution Systems

- Each City operates its own individual plant
- Groups of Cities jointly operate multiple plants
- One regional plant serves the entire southeastern Parker County study area

Water Treatment Options Regional vs. Individual Approach

- None of the cities in the study area currently has treatment facilities or staff
- Aledo, Hudson Oaks, Willow Park and some of the private water supply corps. have existing storage and distribution infrastructure
- Multiple plants result in higher cost for smaller facilities: increased expenses for land purchase and duplicity in O&M costs
- Piping network from Lake Benbrook to each city/utility will be essentially the same regardless of the location of plant or plants. Additional plants would only amount to additional costs.

Water Treatment Options One Regional Plant

- Reduces property acquisition costs
- Reduces O&M
- Allows for construction economies of scale
- Allows for single point of contact with regulatory agencies on treatment issues
- Regional plant wholesales to cities who can keep their existing billing and distribution systems
- Cities and private suppliers would not have retail competition

Project Execution

How Was the Analysis Performed?

- Projected population trends
- Projected entity boundary growth trends
- Determined existing well supplies
- Determined annual water demand projections through duration of study
- Analyzed alternatives to meet demand
- Determined cost and phasing

Project Execution

Entity Boundary Growth

- Plotted existing city limits
- Plotted existing ETJ limits
- Projected future ultimate growth boundaries
- Cities assumed to increase city limit area at 10% per year until boundary reached

Project Execution

Alternatives to Meet Demand

- **Wells**
 - Approximately 276 additional wells needed by 2028
 - Each well heavily restricts 2 acres of land (well head easement)
 - Each well could potentially impact up to 18 acres of land
 - Geographically prohibitive
- **Treatment Plant**
 - 12 mgd treatment plant needed by 2028
 - Service areas include Hudson Oaks, Willow Park, Aledo, all three Annettas, Unincorporated Highway 377 corridor, minimal service to areas in Fort Worth ETJ
 - It is assumed that Fort Worth will annex the majority of their ETJ and serve the area from their existing eastern systems. However, there is no known time frame for this expansion and when it does happen, it will not benefit other cities.

Project Report

Excerpts From The Report

- The following sheets are excerpts from the Preliminary Report sent to the Texas Water Development Board (with modifications as noted).

Project Report Recommendation Summary



Project Report Recommendation Summary

- Work as a Regional Effort
- Pursue Purchasing Water From TRWD
- Partner to the Maximum Extent Possible with Weatherford on Transporting Raw Water to the New Treatment Plant Site (Joint ROW and/or piping).
- Have a Regional Entity Treat and Distribute Water to Retail Water Providers
- Stay Involved and Diligently Pursue Surface Water Before Another Major Drought Weather Period

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APPENDIX G - NEWSPAPER ARTICLES

Index of Articles

Copies of Relevant Local Articles

INDEX OF MEDIA ARTICLES

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Tuesday, June 30, 1998	Weatherford Democrat	County Wide Burn Ban, Fireworks Pose Potential Hazard	1
Thursday, July 02, 1998	Weatherford Democrat	Water Problems Throughout County: One Addition in Weatherford Asked to Voluntarily Ration	1, 2
Thursday, July 02, 1998	Weatherford Democrat	Water Problems Throughout County: County Water Supply Corp. Asks for Voluntary Rationing	1, 2
Thursday, July 02, 1998	Weatherford Democrat	Water Problems Throughout County: Willow Park to Enforce Water Rationing	1, 2
Thursday, July 09, 1998	The Community News	Fire and Water	A1
Thursday, July 09, 1998	The Community News	Community Notes	A1
Thursday, July 09, 1998	The Community News	Rains Helped Quell Grass Fires	A16
Saturday, July 11, 1998	Fort Worth Star Telegram	Watching the Water Flow	1A, 15A
Wednesday, July 15, 1998	Weatherford Democrat	Mayor: Willow Park Water Situation 'Critical'	1, 3
Thursday, July 16, 1998	The Community News	Willow Park Mayor Stresses Need for Water Conservation	A1
Thursday, July 16, 1998	The Community News	Willow Park Council Awards Bid to Join Water Systems	A6
Thursday, July 16, 1998	The Community News	Water Conservation Tips	A6
Thursday, July 16, 1998	The Community News	Outdoor Burning Prohibition Renewed by County Court	A7
Thursday, July 16, 1998	The Community News	Water System Management Should Be Proactive	A11
Thursday, July 16, 1998	The Community News	Community Notes	A1
Thursday, July 16, 1998	The Community News	Willow Park Water Rationing Explained in Detail	B5
Thursday, July 23, 1998	The Azle News	PCUD to Seek Contract	1A, 2A
Thursday, July 23, 1998	The Community News	Texas Water Crisis One of Biggest in Recent History	B1
Thursday, July 23, 1998	The Community News	Community Notes: Burn Ban Continues	A1
Thursday, July 23, 1998	The Community News	Community Notes: Broken Record Department Quote	A1
Thursday, July 23, 1998	The Community News	Aledo Experiencing Record Water Use Despite Rationing	A1
Thursday, July 23, 1998	The Community News	Water Study Meeting Scheduled for August 4	A1
Thursday, July 23, 1998	The Springtown Epigraph	Burn Ban Extended	2
Saturday, July 25, 1998	Fort Worth Star Telegram	Water Shortage Limits Productivity in High Rise Offices	7A
Saturday, July 25, 1998	Fort Worth Star Telegram	Water Line Break Tough to Prevent, Tougher to Predict	7A
Saturday, July 25, 1998	Fort Worth Star Telegram	Water Use Limited to Necessities, Fort Worth Pumps Expected to be Back on Line Monday	1A, 6A
Saturday, July 25, 1998	Fort Worth Star Telegram	Water District Cuts Flow to Lake Arlington	6A
Monday, July 27, 1998	Weatherford Democrat	Stock Ponds, Tanks Quickly Drying Up	1
Thursday, July 30, 1998	The Azle News	Burn Bans Extended	4A
Thursday, July 30, 1998	The Azle News	Drought of 1998 leaves Texas, Texans High and Dry	14A
Thursday, July 30, 1998	The Community News	Letter to the Editor: Rain Helped Some, Water Rates Will Help More	B3
Thursday, July 30, 1998	The Community News	Aledo Restricts Watering Hours	A8
Thursday, July 30, 1998	The Community News	Tuesday Afternoon Fire Chars Aledo Ranch Land	A1
Thursday, July 30, 1998	The Community News	Water Occupies Willow Park Council Meeting	A1, A4
Thursday, July 30, 1998	The Community News	Changes to Willow Park's Emergency Rationing Plan	A4
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Thursday, July 30, 1998	The Community News	Water Study Meeting August 4	A6
Thursday, July 30, 1998	The Community News	Water Rationing Update	A1
Thursday, July 30, 1998	The Springtown Epigraph	City Opts to Ration Water	1
Sunday, August 02, 1998	Fort Worth Star Telegram	Grass Fire Burns Home, Swimming Pool	1A
Sunday, August 02, 1998	Fort Worth Star Telegram	Wildfire Poses Threat to Homes	2B
Sunday, August 02, 1998	Fort Worth Star Telegram	Warm Memories	1A, 8A
Sunday, August 02, 1998	Weatherford Democrat	Drought Fears Realized	1A, 2A
Sunday, August 02, 1998	Weatherford Democrat	Council Also Addresses Fire Sprinkler Plan, Water Pumping, Storage	3A
Sunday, August 02, 1998	Weatherford Democrat	WP, HO, Aledo, Parker, PCUD #1 Meet to Address Water Supply	2A
Monday, August 03, 1998	Fort Worth Star Telegram	How Hot is It?	1A
Monday, August 03, 1998	Fort Worth Star Telegram	Fire Spares Homes, Church	1B
Monday, August 03, 1998	Fort Worth Star Telegram	Pipeline Blowout Cuts Water, Supply to Tarrant Drops 33%	1A, 9A
Monday, August 03, 1998	Weatherford Democrat	Burn Ban Continues	1, 2

Tuesday, August 04, 1998	Fort Worth Star Telegram	That Strange Stuff Falling From the Sky Was Called "Rain"	9A
Tuesday, August 04, 1998	Fort Worth Star Telegram	Crucial Pipeline Repaired	1A, 9A
Tuesday, August 04, 1998	Fort Worth Star Telegram	General Compliance Marks Watering Ban	9A
Thursday, August 06, 1998	Fort Worth Star Telegram	Water From Fixed Pipe Reaches Lake	1A, 13A
Thursday, August 06, 1998	Fort Worth Star Telegram	The Seven Dry Years, The 1950's Drought Ended with a Deluge	1B, 2B
Thursday, August 06, 1998	Fort Worth Star Telegram	Showers Take The Heat off Weary North Texas	1A, 13A
Thursday, August 06, 1998	Fort Worth Star Telegram	Lake Arlington's Drop Spurs Memories, Look at remedies	13A
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Thursday, August 06, 1998	The Community News	Making Way for Water	A1
Thursday, August 06, 1998	The Community News	Hudson Oaks Council Votes to Hook Onto Willow Park Sewer System	A3
Thursday, August 06, 1998	The Community News	Willow Park To Drill Additional Water Well	A4
Thursday, August 06, 1998	Weatherford Democrat	Hudson Oaks to Act on Excessive Water Use	1, 3
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Sunday, August 09, 1998	Weatherford Democrat	Eastern County Towns Plan for Future Water Supply	1A, 5A
Sunday, August 09, 1998	Weatherford Democrat	Short-Lived Relief	1A
Thursday, August 13, 1998	The Community News	Consulting Firm Recommends Site North of Aledo for Water Treatment	A4
Thursday, August 13, 1998	The Community News	Rain Dance	A1
Thursday, August 13, 1998	The Community News	Group Recommends Surface Water to Meet Future Needs	A1
Thursday, August 13, 1998	The Springtown Epigraph	Still on Tap: Water Rationing Set Until August 20	1
Thursday, August 13, 1998	Weatherford Democrat	Hudson Oaks Utility Board: Scrap Excessive Water Use Rates	1A, 2A
Thursday, September 10, 1998	Weatherford Democrat	Hudson Oaks Defines Excessive Water Use	1, 5
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Ongoing	The Community News	Water Study Background Information Website	

POSSE RODEO RESULTS, SEE SPORTS PAGE 8

The Weatherford

DEMOCRAT

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No. 150

FRIDAY
June 26, 1998

50 cents
12 pages, 1 section

DAILY WATCH

WEATHER — Tonight, mostly clear. Low in the upper 70s. Southeast wind 10-20 mph. Saturday, mostly sunny. High in the upper 90s. South wind 10-20 mph. Extended forecast. Saturday night, mostly clear. Low in the upper 70s.

WACO (AP) — The investigation into a bank executive's slaying has led authorities to discover that at least \$600,000 is missing from the Kosse First State Bank, sources say.

Michael Wells, vice president of First State Bank, was shot three times in the back with a .25-caliber handgun during a May 14 holdup.

However, no money was taken from the bank's vault, which was on a time lock and not set to open until later in the morning, Limestone County Sheriff Doyle Cozlin said.

Authorities from state and federal agencies assisting in the investigation decline comment on the missing funds. But sources close to the investigation confirmed to the Waco Tribune-Herald the missing funds.

WP issues Phase 1 water rationing

WILLOW PARK — As of June 25, the City of Willow Park has entered into mandatory stage 1 water rationing for the entire city of Willow Park. Stage 1 water rationing (mild rationing condition) is defined in Willow Park code of ordinance, Chapter 11, Section 11.209 as follows:

Outdoor usage of water for purposes such as lawn, trees and garden watering, car washing filling swimming pools (with the exception of new pools) etc., must be accomplished on alternate days and

during hours specified by the City. Additional exception allows hand watering of new plants and shrubbery within the 24 hour period of designated days.

Even house numbers will water on even numbered days and odd numbers will water on odd numbered days. Watering is restricted to the hours of midnight until 6 a.m.

City staff stated they apologize for the inconvenience, but due to the drought-like conditions, it is extremely important that all persons abide by this request to permit

the city water well pumps to provide an adequate amount of water to satisfy the present home and emergency water requirements."

According to city staff, with every home doing their share of conserving water, the city should not be required to enter into Stage 2 water rationing.

Water rationing is not mandatory for private well owners, but they are encouraged to be prudent in water usage.

For more information call 317-441-7533.



Little girl, big voice

Dianna Herold sang the National Anthem at the opening night performance of the Parker County Sheriff's Rodeo. This was her second year to open the rodeo. For more on the rodeo, see Sports page 8.

Freedom House donation...



Arrest made for 'snow cone' robbery

WEATHERFORD — According to a Weatherford Police Department spokesperson, an arrest has been made in the aggravated robbery case which occurred on June 18 at the Snow Biz Snow Cone business located in the 600 block of Palo Pinto Street.

The investigation, headed by Detective Greg Lance, (in cooperation with...

The suspect, who was identified as Oberiss Lee, a 17-year-old black male of Fort Worth, was arrested in Fort Worth. Lee was picked up from Tarrant County on June 25 by police detectives and returned to Weatherford where he was charged with the offense of aggravated robbery.

Lee is being held in the Parker County Jail.

DEMOCRAT

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1895

TUESDAY
June 30, 1998

12 pages

County-wide burn ban

Fireworks pose potential hazard

By DANIELLE SCHULMAN
Democrat Reporter

PARKER COUNTY— Concern over hot, dry weather and fireworks displays is spreading among city and county officials faster than the proverbial wildfire.

Yesterday, an emergency order prohibiting outdoor burning in Parker County was signed by County Judge Ben Long. According to the Texas Department of Public Safety, Parker County is among more than half of the counties in Texas that have burn bans in place.

According to the order signed by Long, a person is in violation "if they burn any combustible material outdoors or orders such

burning by others. The use of barbecue-type equipment is permitted for cooking use only."

Weatherford Fire Marshal Kurt Harris, and the County Fire Marshal, Jeff Edwards, are expressing concern about the unusually dry weather which brought about the ban.

Harris said he and WFD Chief George Teague are very worried and concerned, especially with the weather situation cropping up around the July 4th holiday.

"It just takes that one spark," Harris said.

Fireworks and the weather conditions just don't mix, Harris said. According to Harris, the hot, dry and windy conditions, unusual for this time of year, create a potentially hazardous situation when combined with the use of fireworks.

"There is a potential hazard ... I'm talking about from now on," Harris said.

In Weatherford, an ordinance prohibits the possession, sale, use and manufacture of any Class C fireworks, according to Harris. All fireworks are Class C and above, Harris said. He said the department has had a problem at Lake Weatherford in the past.

"People within the city have always been good about obeying that," Harris said of the ordinance.

The WFD and authorities are going to be harder on those who violate the ordinance, with violators subject to a Class B misdemeanor, according to Harris. Class B misdemeanor carries a maximum fine of \$1,500 or 180 days in jail, according to Edwards.

Edwards said he would prefer people attend the commercial fireworks show in Weatherford. "We would prefer nobody buy or use fireworks," Edwards said.

"Conditions are much more dangerous for this type of fireworks," Edwards said.

As it's been for several years, according to Edwards, the county is counting on people to be responsible.

Weatherford Fire Marshal Kurt Harris said, the county doesn't have the means to close down the fireworks stands.

Burn ban in Hudson Oaks

On Saturday, the City of Hudson Oaks passed an order signed by Mayor Gene Voyles prohibiting outdoor burning.

According to the order, "no person shall burn any combustible material within the corporate limits of the City of Hudson Oaks outside of an enclosure which would prevent the escape of flames or sparks."

The Hudson Oaks order has additional actions prohibited and a section for enforcement.

Under enforcement, "at the discretion of a peace officer or fire chief of a responding fire department, flagrant violations or subsequent violations by persons previously notified of this order may be prosecuted in accordance with the laws and procedures of this state and of the City of Hudson Oaks."

It just takes
that one
spark.
Weatherford
Fire Marshal
Kurt Harris

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THURSDAY
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DAILY WATCH

WEATHER — East advisory through Friday. Afternoon heat index values 105 to 115 degrees. Tonight, fair with a low around 80. South wind 5-16 mph. Friday, partly cloudy. High in the upper 90s. South wind 10-20 mph.



DALLAS (AP) — Plaintiffs in the sex abuse and conspiracy case against the Catholic Dio-

Water problems throughout county

County Water Supply Corp. asks for voluntary rationing

PARKER COUNTY — Parker County Water Supply Corporation asks for voluntary rationing in the service area for their voluntary help in conserving water.

Drought conditions exist in the county, which are due to the lack of rain and hotter than normal high temperatures this year. These conditions have caused excessively high amounts of water usage by customers, according to the board of directors and the manager of the service area (Brook, Dennis, Fox Prairie, Bennett, Dobbs Valley, Greenwood and outlying areas).

When these conditions exist, the normal repairs that are

See PCWSC, page 2

Willow Park to enforce water rationing

WILLOW PARK — Willow Park is still in stage 1 water rationing and will remain so until further notice. According to city staff, the city water system is currently experiencing a demand for water that exceeds its capability for producing and storing it. This condition is detrimental to the welfare and safety of the city's citizens, homes and property.

Effective today, July 2, 1998, Willow Park is changing the hours that residents can use water outdoors.

Homes with even numbers are restricted to watering on even numbered days and odd numbers are restricted to

See Willow Park, page 2

One addition in Weatherford asked to voluntarily ration

WEATHERFORD — Weatherford shouldn't be alarmed about a possible water ration, according to the city's Assistant Director of Utilities, Sharon Hayes.

"We're keeping up with all the demands in town," Hayes said today in a phone interview. "We're doing just fine with the main system."

According to Hayes, the city has asked residents of the Westside Addition off of Old Dennis Road to voluntarily cut back on their watering. The addition has large yards, Hayes said.

Calls are generated into the city when we start making to

See Weatherford, page 2

PCWSC

Continued from page 1
 Inevitable on any water system are sometimes made more difficult and take more time. Personal use is obviously the first priority and animals must be watered. Anything else would be secondary.

Voluntary conservation is requested of each person to help assure all of us of having enough water for necessities. Voluntary cooperation will prevent a mandatory rationing program.

Weatherford

Continued from page 1
 cut back, Hayes said.

"We are not having a problem that some of the other systems were having," Hayes said.

She said the peak day for water

consumption reached just under 7 million gallons. The Weatherford system is rated at 8 million gallons, according to Hayes.

"We have a little bit of room left," Hayes said.

Willow Park

Continued from page 1
 watering on odd numbered days. The watering hours are restricted to twice a day, between the hours of 8 and 10 a.m. and 8 and 10 p.m. on the assigned days. Watering may be conducted by hand-held hose watering. The use of sprinklers and sprinkler systems are prohibited. The city of Willow Park will have zero tolerance for non-compliance.

In accordance with Ordinance 405-97, violators will be cited. If there are any further violations, water service will be terminated. Water service can be reconnected after seven days after all applicable fees have been paid.

According to city staff, this action is being taken in an attempt to keep the city from entering Stage II Water Rationing. Stage II Water Rationing does not permit outdoor water usage. If you have any questions please feel free to call the city of Willow Park at 441-7533.

...

The Community News

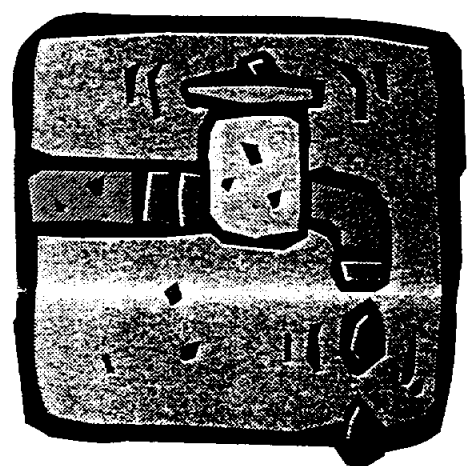


Serving Eastern Parker County: Aledo ★ the Annettas ★ Huds

Volume 9, Issue #28

<http://www.community-news.com>

July 9, 1998



Local faucets tightened

Aledo has joined the list of local communities to institute Stage I water rationing. Aledo's policy calls for even-numbered homes to water on even numbered days, and odd numbered homes to water on odd numbered days. More information can be found about the Aledo rationing, as well as Willow Park's continued Stage I rationing, elsewhere in this issue.

Fire and Water

- Parker County Emergency burn ban continues - no outdoor burning
- Willow Park Stage I Water Rationing (Even/Odd rationing, no sprinklers, no watering only) between the hours of 8 and 10 a.m. and 8 and 10 p.m. For more information call Willow Park City Hall at 441-7533. Zero tolerance policy in effect.
- Aledo Stage I Water Rationing (Even/Odd rationing, no set mow days) hours. For more information call Aledo City Hall at 441-7016.

The Community News

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Volume 9, Issue #28

<http://www.community-news.com>

July 9, 1998

Rains helped quell grass fires

Fireworks induced fires slowed down by moisture

By Geoff Mantooth

Rain provided a pleasant and well-timed surprise for the Fourth of July. It was a good thing too, because up until the time it rained, firefighters were kept busy with grass fires around the area.

On Friday, fireworks started a grass fire by the Park and Ride on FM 1187 and I-20. The call came in at the uncivil hour of 2 a.m. Later that same day, fireworks sparked another grass fire off of Farmer Road.

Our new substation, now operational, played a role in putting out both of these fires. Rodney Mays and Morris Leondar live nearby. They both find it much faster to drive to the substation, man the truck that is stationed there, and drive to the scene, than to drive all the way in to town.

The new substation is located on White Settlement Road, just west of Farmer Road. Although the substation is operational, it still needs work. For example, for the time being, it lacks wiring. According to Mays, "It sure is dark inside of there," without any lighting. Providing wiring is a high priority.

Saturday proved to be even busier than Friday. Again, a call came in about 2 a.m. A grass fire was spotted near Bankhead and FM 1187. About two acres were

burned. An estimated 400 gallons were needed to put it out.

Later that afternoon, another grass fire occurred at Thunderbird Park in Tarrant County. The park is located near Benbrook Lake. Benbrook provided much-appreciated mutual aid. About 600 gallons of water were used.

Just as the trucks were returning from the Thunderbird Park fire, another call came in of a third grass fire off of I-20, east of the RV Park. About a 175 gallons were used. Willow Park provided mutual aid.

A fourth fire was reported a short time later. That made three grass fires in about an hour. This other fire was along the railroad tracks off of Annetta-Centerpoint Road. Not much grass was burned. However, more than 800 gallons of water were used because the fire had spread into some underbrush along a fence line.

After that fourth fire, the rain came and poured in some spots and drizzled in others. Firefighters manned the station in preparation for the evening's fireworks-induced fires but they never came. Nobody was complaining.

A somewhat bizarre incident occurred last Thursday night. Two vehicles collided on I-20 around 9 p.m. A Chevy pickup and a Buick Skylark collided, with one of the

Aledo Volunteer Fire Department

vehicles rolling over. The accident tied up traffic on the interstate for some time. One of the vehicles in traffic was an 18-wheeler with a unique load. Apparently, the 18 wheeler came to too abrupt of a stop, causing its load to shift. Quite a bit of it spilled out onto the pavement. To everyone's disgust, the load turned out to be animal parts, no doubt bound for some processing plant.

The State Department of Highways was called in to clean up the mess. If you have ever wondered about how these things are cleaned up, here's the answer. A front end loader arrived. It dug a hole by the side of the road, pushed the offal into the hole and covered it all up with dirt. Firefighters, who had stuck around to assist, washed down the road with pressurized water from their truck.

The driver of the 18 wheeler which lost the load to begin with never did stop to help.

Have a safe week.

CITY FINAL
Fort Worth Star-Telegram

SATURDAY, JULY 11, 1998

Tarrant County, Texas • "Where The Heat Begins"

www.star-telegram.com

WATCHING THE WATER FLOW

Record usage could spur mandatory conservation as area departments strain to keep up with the demand.

By JENNIFER SCHULTZ
Star-Telegram Staff Writer

If the Fort Worth Water Department continues to pump water at record rates to keep pace with the hot, dry weather, customers across Tarrant and southern Denton counties will be asked to curtail their usage, officials said yesterday.

Water restrictions could come as soon as Monday, although the department hasn't decided what conservation measures would be used. The city expects to pump a record 290 million gallons today, as the demand just keeps growing.

"Anything above 300 million gallons and we have to have some kind of control," said Charly Angadichenil, the water department's assistant director of production. "Everybody is looking at different options and backup plans."

If the heat wave continues, water use might approach the department's pumping capacity of 325 million gallons, he said.

Overloading the system could cause water pressure to drop throughout Tarrant County, break water mains and jeopardize fire-

(More on WATER on Page 5)



Joe Tolson, a worker with the Fort Worth Water Department's South Holly Treatment Plant, takes water samples for testing yesterday. The department pumps water to Fort Worth and many other communities in North Texas.

Water

From Page 1

fighting ability.

"If we don't get any rain for two or three weeks in a row, we may see something close to 325 million gallons," Angadichenil said. "What we are nervous about is a major fire. Those are the kinds of things we worry about, not drinking water."

The department serves 800,000 customers in Fort Worth and 300,000 customers in 25 other cities, including Burleson, Haltom City, Keller, North Richland Hills, Richland Hills and Southlake.

Several of those cities, with their water supplies stretched by residents watering lawns and filling swimming pools, have already put conservation plans into action. Others have been waiting for Fort Worth to make a move.

Keller began a voluntary conservation plan in late June, but City Manager Lyle Drescher said a mandatory program will probably

begin next week.

"I don't think we have any choice, because we are not getting the cooperation we need from the voluntary program," Drescher said.

Southlake officials, who also began a voluntary program in June, said they don't plan on mandatory restrictions unless Fort Worth requires it.

Steps such as odd- and even-day watering may be considered, Angadichenil said.

The city pumped a record 280 million gallons yesterday, Angadichenil said.

Angadichenil emphasized that there is not a shortage of water. But the water department's four treatment plants can process and distribute a maximum of 325 million gallons per day, he said. The city has 2,600 miles of pipes to distribute the water.

About 300 million gallons of water can be transported to the plants from Lake Worth and Eagle Mountain Lake. When those pipes are filled to capacity, Fort Worth uses Benbow Lake for the remaining 25 million gallons of water.

"We have everything ready to just turn the power on and start pumping from Benbrook," he said. "We will have to evaluate the conditions ... and determine if that is necessary."

Officials with the Trinity River Authority, which supplies water to Bedford, Colleyville, Euless and Grapevine, said the authority pumped a record 61 million gallons yesterday — 4 million gallons more than the recommended capacity.

But authority spokesman John Jalmrosich said they will not require cities to cut down on their water use.

"It's the cities' call on what to say about cutbacks. It's not our business," he said. "If they haven't had a need to call for water conservation yet, they probably won't need to."

Officials in Bedford and Colleyville said they are monitoring conditions.

There is a slight chance of thunderstorms tomorrow, Monday and Tuesday, a meteorologist with the National Weather Service in Fort Worth said yesterday.



Fort Worth firefighter Joe Stewart of Station No. 5 works to put out a grass fire at 2100 E. Belknap yesterday. The fire scorched about 20 acres and took about an hour to extinguish after the first call came in at 3:11 p.m. Smoke billowed from the field, fueled by material thought to be illegally dumped insulation. The smoke drifted over the Trinity River and did not affect traffic on nearby Interstate 35W.

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WEDNESDAY
July 15, 1998

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14 pages, 2 sections

DAILY WATCH

WEATHER (AP) — Heat advisory in effect through Thursday. Afternoon heat index values 105 to 115 degrees. Tonight and Thursday, clear to partly cloudy with a slight chance of thunderstorms. Low near 80. High 100 to 103, south to southeast east wind 5-15 mph. Chance of rain 20 percent tonight and 20 percent Thursday. Extended forecast, Thursday night, partly cloudy with a slight chance of evening thunderstorms. Low in the mid 70s to near 80. Friday through Sunday, clear to partly cloudy. A slight chance of thunderstorms Saturday. Highs 100 to 104. Lows in the upper 70s to near 80.

LUBBOCK, Texas (AP) — Scorching temperatures and little rain will continue to fuel the current drought for at least another month, according to reports from the National Weather Service. And if the drought continues into August, researchers at Texas A&M say state economic losses will top the \$4.6 million.

Mayor: WP water situation 'critical' Threatens to cut off water to abusers

By CAROLYNE GOULD Editor

WILLOW PARK — Record-breaking high temperatures, mechanical difficulties and high water consumption has decreased this city's water production by 30 percent according to Mayor Les Cooley.

Cooley released a statement to the press yesterday afternoon asking the citizens of Willow Park and other users connected to the city's water system to halt, cease and desist when it comes to using water unnecessarily.

He warns that unless water usage is decreased, Willow Park will begin Stage II water rationing which will prohibit all outside watering (other than livestock).

See WP, page 3A

Beating the heat



Discovered Photo by Fred Mitchell
Kristen Culver, Addison Stephens and Sarah Culver find relief from the heat on the steps of the "Cow Patty Diner." in Parris, Sunday afternoon when area temperatures soared to record highs. The diner has a sign at the door that reads "All you can eat if you got the cash" and is attached to the Parris Grocery Store downtown across from the Post Office.

WP

Continued from page 1A
Cooley also warns that violators will have their water service terminated.

Construction of a 12-inch water line to connect the Willow Springs and Willow Springs Oaks to the main water system is expected to get underway within the next 10 days, Cooley said. That area has experienced "no water" on four separate occasions, he reported.

"Some water customers are unable to shower or have a drink of water because a few are unwilling to follow the rationing policy now in effect," Cooley said. He states that some water customers "are putting a higher priority on keeping their personal yards green rather than ensuring their neighbor has sufficient water."

In addition to domestic needs, the city needs to have sufficient water on hand to provide fire protection for the city.

"Not having a sufficient water supply has become a critical problem for the whole City," Cooley stated. "The dry weather and increased water demand is having a drastic impact on our water system. Our wells and pumps are not getting sufficient rest time. The continuous operation of the well pump encourages mechanical break-downs and the well's ability to recharge. The draw down of the water table has been significant over the past two months, and our wells are experiencing greater than 30 percent decrease in water production."

"Because of emergency conditions created for all customers by a few water customers, the City is taking the stand that this type of philosophy can not, and will not, be tolerated," Cooley states. "Repeat violators will immediately have their water service terminated. In addition, the water customer will be required to pay a disconnect and reconnect fee, as well as, be issued a citation."

Cooley requests voluntary conservation efforts by all Willow Park citizens in hopes Stage II water rationing can be avoided. "The City can not see an immediate decrease in the demand for water, the next message you will receive will be one initiating Stage II Water Rationing, which prohibits any outside watering. With your help, I will not have to distribute that message," Cooley stated.

Kelly C.

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Time 9, Issue 29

<http://www.community-news.com>

July 16, 1998

Willow Park mayor stresses need for water conservation

by Randy Keck

Willow Park residents are being asked by Mayor Les Cooley to cooperate with the city's water rationing policy in order to avoid more stringent water control measures.

Willow Park's current water rationing policy calls for even numbered houses to water on even numbered days, and vice versa. Outside watering is restricted to the hours between 8 and 10 a.m. and 8 and 10 p.m.

Based on the rationing policy, the pumps which supply Willow Park's wells should be able to replenish the city's storage tanks dur-

ing the off-hours.

However, according to a letter from Cooley addressed to Willow Park citizens, water consumption is not dropping off during off-peak times, and this is hampering the wells' ability to recharge.

Because the water table is also dropping, the wells are having to work harder just to keep up. According to Cooley, Willow Park's wells are experiencing "greater than 30% decrease in production."

The city has inspected water lines to look for leaks, and have found none. Therefore,

according to Cooley, "the obvious conclusion is that some water customers are putting a higher priority on keeping their personal yards green, rather than ensuring there is a sufficient water supply for domestic needs and fire protection for the entire city."

The city has taken the stance that repeat violators of the water rationing policy will have their water service disconnected, be required to pay a disconnect and reconnect fee, and be issued a citation.

According to Cooley, if the city does not see an immediate decrease in demand for water, the city will institute Stage II

Related story, water conservation tips on page A6

rationing, which prohibits all outside watering. Willow Park citizens who have questions about the city's policy can call 441-7533. Any changes in Willow Park's rationing policy between now and next week's issue of *The Community News* will be posted on our web page at www.community-news.com.

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Willow Park council awards bid to join water systems

by Randy Keck

At a special meeting Thursday night, the Willow Park city council approved a bid for construction of a 12" water line to connect the city's main water system with Willow Springs and Willow Springs Oaks.

The two areas of the city, which are separated by Interstate 20, have operated on different water systems. The city's bid approval will allow construction to begin to place a 12" water main under the interstate to connect the two systems.

Due to the drought and hot weather, the production capacity of the water system at Willow Springs and Willow Springs Oaks has not been able to meet demand. Willow Park mayor Les Cooley, in a letter to residents of the area, stressed the need for water conservation.

"Since the beginning of June, the Willow Springs and Willow Springs Oaks Subdivisions have experienced 'no water' on four separate occasions," said Cooley's letter. "Some water customers are unable to shower or have a drink of water because a few are unwilling to follow the rationing policy now in effect."

The winning bidder for construction of the water main was Aledo Construction, with a bid of \$389,505.66. According to the terms of the contract, construction should begin within ten days of the awarding of the bid (July 9), and should be completed no later than 120 days after construction starts.

Exxon site plan, re-plat approved

In additional business at the special meeting, the council approved a re-plat in Willow Park's extra-territorial jurisdiction of the Oakview Estates subdivision. The re-plat shifted a property line in order to save some trees.

The council also approved a change in the site plan for the Exxon station and car wash which is to be constructed at the corner of Ranch House Road and I-20. The original plan called for the car wash to be attached, but owners of the property want to include a fast-food restaurant with drive-through at the site. Due to those changes, the car wash will now be in a separate building.

Lau
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Water Conservation Tips

Three weeks ago we ran an article with water conservation tips. The following is a greatly condensed version:

As a hot summer develops, Texans are faced with the dilemma of how to conserve water while keeping their lawns and gardens green.

Texas Agricultural Extension Service horticulturist Dr. Doug Welsh said to look at the plant to determine when to water.

"Add about an inch of water to the lawn so that it will soak in about 6 inches deep in a clay soil," he said.

The best time of day to water is in the late evening or the early

morning, Welsh said.

Another way to prevent evaporation during the summer months is to mulch vegetable and flower gardens.

"The key is to get a barrier between the soil and the atmosphere so that we prevent that loss of water," Welsh said.

Kelly

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Outdoor burning prohibition renewed by county court

A Disaster Declaration and a Prohibition of Outdoor Burning were signed and approved by Commissioners Court on Monday morning, according to Parker County Fire Marshal Jeff Edwards.

The actions, taken to help control the hazard posed by wild-fires during the current hot, dry weather, prohibits outdoor burning. The use of bar-b-que type

equipment is permitted for cooking use only.

In addition, the Prohibition provides for enforcement of the Burn Ban. An officer at the scene and/or the fire chief can, at their discretion, notify the party of the provisions and request compliance. The notification will be logged and if any further violations occur the order may be prosecuted.

Kelly

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Water system management should be proactive

Dear Editor:
We are writing this to be proactive and give information regarding the summer usage of water in Deer Creek. Last year, an article was written in the newspaper which made the homeowners in this subdivision appear to be non-caring of our natural resources.

We are on Stage 1 water conservation. This was a letter which was understood by homeowners to be a compliance issue. (For the record, like Willow Park, I believe that the Waterworks should have also put a notice in the newspaper. Most Deer Creek residents do not even use their front doors for entry.)

We then received a flyer at our front doors on Friday, July 3, dated July 2, which was worded in such a

way that it is obvious the water company is starting a negative campaign to make the homeowners appear to be complacent and non-compliant. This flyer restricted the hours of watering. The next line in the letter said "Due to non-compliance and excessive drought..." Excuse me but I would like to know who is in non-compliance. We were told in a note dated Monday and placed in our doors to begin odd/even; in a letter dated three days later, we were told we were in non-compliance. How many of those neighbors were on vacation (utilizing timers) or have their own wells (front section of Deer Creek) and could be observed by someone to be non-compliant?

The July 2 letter said "permitted operators will monitor outside-

odd/even watering. Customers found in non-compliance can have their service terminated..." Included were May and June pumpage reports. Has the water company stopped to think there were several swimming pools put in during that timeframe? Many neighbors are putting in new grass and landscaping or fertilizing their yards. Maybe it would be a good idea, instead of throwing up statistics of usage like was done in the newspaper last year, to try to be proactive with water users. Since homeowners must get permits for pools from the City of Annetta, and the city franchises the Water Company, the city could let the water company know that a new pool is being built. There could be a special fee for filling pools and

the pools could be filled on a staggered system, if necessary.

The last question is this: Does the new Deer Creek Phase VII, which is being built south on Lakeview Road toward Highway 5, have additional storage capacity and pumping capability built in prior to people building houses on an already tight water capacity system? There are several lots sold and several houses in various stages of development. Upon completion of the first house, water will be utilized for their new sewer system in addition to basic water needs (house and new landscaping). We are still having a few new homes built on the remaining lots in the older sections of the subdivision. Those alone will cause an increase to usage during the sum-

Letters to the Editor

mer months, without taking into consideration the new homes in the new phase of the subdivision.

We want to make sure that people understand how frustrated homeowners are with the situation. We do care about our environment! This letter was written to communicate information before the water company begins this year's negative campaigning.

C.L. Bender, Annetta
Editor's note: This letter was edited for length.

40
Kelly C.

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Burn bans, water rationing continue.

The Parker County Fire Marshal is issuing citations to anyone who violates the county outdoor burning ban. The cities of Willow Park and Aledo, as well as Deer Creek, have even-odd water rationing in effect.

Willow Park water rationing explained in detail

by Sam Bertling
Willow Park City Council member

Hot, dry and hot are the most common words used to describe this summer. Under these conditions, there is a large demand for a number of things - iced tea, air conditioning and water to name a few.

Willow Park has elected to ration the last item (but, thankfully, not the other two), because its water system could not pump enough water to meet demand even when running 24 hours a day. When this happens, storage reserves must be used, and the city cannot maintain the state mandated storage requirements for emergency situations such as fire.

Willow Park's stored water had dropped to one-half of the state requirements. With the current rationing plan and citizen participation, Willow Park has been able to meet steady-state demand and started refilling its storage.

This past weekend, however, demand spiked and Willow Park lost ground on its storage fight. Should this continue, the city will have no choice but to impose stricter water rationing measures.

The city of Willow Park has 18 water producing wells which are long vertical pipes running down into the underground rivers that feed them (aquifers). Pumps are placed in these pipes and submerged in the aquifers. Since the aquifers run through dirt and rock, there is a great deal of silt and sand in the water. To prevent damage to the pumps, a two-tier filtration system is used. The first line of defense is a gravel sleeve that surrounds the pump and pipe. This sleeve filters out larger sediment. A screen serves as the second filter and

removes finer particles before they reach the pump.

All of Willow Park's wells vary in output. In total, they produce about 952 gallons of water per minute. This translates to 1.4 million gallons per day if they are operated 24 hours per day. This year, due to the drought conditions, the aquifers are not as full (as any river) and daily production levels have dropped about 20% to 1.1 million gallons per day. Again, this is operating the pumps 24 hours per day.

Unfortunately, the pumps cannot run 24 hours per day for two reasons. The first is that the gravel sleeve that surrounds them becomes packed tightly together as more water is sucked through it. Second, the pumps remove water faster than the aquifer can replenish it. This creates a situation where the pump is working harder to pump less water through a tighter opening. Think about sucking on a straw with your finger over one end. Because of this, it is necessary to "rest" the pumps for four to eight hours every day allowing the aquifer to become replenished and the gravel to float apart.

Giving the pumps a minimal four-hour rest period each day means that, practically, Willow Park can produce (in the drought conditions) about 950,000 gallons of water per day. A six- and eight-hour rest period would mean production of 853,000 and 760,000 gallons per day, respectively.

In addition to pumping water, Willow Park has several storage tanks, which have a total storage capacity of approximately

1,000,000 gallons. These tanks serve two main purposes.

First, and foremost, they are required by the state to ensure adequate water supply in the system should an emergency, such as a fire, occur. The state storage requirement for a town the size of Willow Park is about 1,000,000 gallons.

Second, this storage allows the city to meet demand that exceeds production capacity for short periods of time. This time period is crucial, since the storage must be brought back up to full capacity for emergencies. Normally, if the system uses some of the storage water it is replenished in about two hours after demand has slackened. If usage does not slacken, however, the city is not able to replenish the stored water.

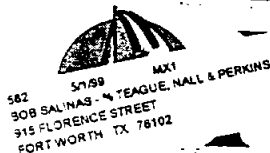
During the winter months, Willow Park normally uses about 250,000 gallons of water per day. This means that production capacity exceeds demand almost fourfold. Earlier this summer, due to lack of rain, demand on the system was 1,000,000 gallons of water per day. If the pumps were run 24 hours per day, seven days a week, this demand could almost be satisfied. But as was highlighted earlier, there are reasons the pumps should not be run continuously. If usage spiked, the city would have to use stored water to meet that demand. But since steady state demand equaled production capacity there would be no way for the system to replenish the used storage and meet state emergency requirements. When demand meets or exceeds production capacity and

storage is below state mandates, rationing is triggered.

On June 25, water rationing was instituted, as Willow Park was unable to meet the state requirements for emergency water storage due to demand exceeding supply capacity. The first plan limited outdoor use to six hours per day at specified times. After one week, system capacity was examined and was still not meeting demand. A second water rationing notice was distributed that reduced the permitted outdoor usage time to four hours per day with a modified time schedule. This rationing plan has been somewhat effective, with Willow Park able to meet steady-state demand.

As of July 13, however, the city's water storage was only one-half of what is required. In the past week, the city was able to refill its storage tanks to approximately two-thirds of state requirements, but over the weekend, demand spiked and drained storage back to one-half. The reason for this spike is unknown, but the city notes that if this continues, there is no alternative but more stringent water rationing.

The city thanks those citizens doing their part to help bring this situation under control. To maintain the system in equilibrium, the current rationing program must remain in effect and citizen participation must continue. If they do not, or if the summer continues on its current course and production decreases again, more stringent water rationing will occur. At least Willow Park doesn't have to ration air conditioning or iced tea.



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50¢

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PCUD to seek contract

BY CARLA NOAH WHEELER

The Parker County Special Utility District No. 1 (PCUD), formed by a special act of the Texas legislature, wants to establish a regional wastewater collection effort in portions of Parker County.

The City of Azle just happens to have an extra wastewater treatment plant.

Could this be the beginning of a beautiful relationship?

PLEASE SEE DISTRICT, PAGE 2A.

District seeks water pact

■DISTRICT, FROM PAGE ONE.

Mark Berry of Teague, Nall and Perkins, PCUD's engineering firm, initiated the courtship at Tuesday night's meeting of the Azle city council.

Berry requested the city of Azle and PCUD enter into an interlocal agreement that would allow PCUD to run an 18-inch sewer line from Azle's Walnut Creek Wastewater Treatment Plant to the site of an elementary school to be built by Springtown Independent School District (ISD) in Reno. PCUD would eventually want to run that line all the way to Springtown, Berry said.

PCUD's main long-term objective is to establish a regional wastewater treatment facility. However, Berry said a consultant for the SISD has made an urgent plea for sanitary sewer service to the proposed school. PCUD will make this request a priority.

PCUD says it will pursue construction of the sewer line if Azle can make treatment of the resultant wastewater available.

Berry also made it clear that PCUD would be interested in purchasing the Walnut Creek plant from the city of Azle — if the council prefers selling it outright to getting deeper into the wastewater treatment business.

Council members authorized City Manager Jim Walker to pursue the possibility of entering into an agreement with PCUD and report his findings back to the council.

Variance request stricken

In September 1996, Rhonda Roof

requested a variance on the number of animals allowed per household. Roof, who is disabled, uses money she earns from selling registered puppies to supplement her fixed income.

That request for a variance was tabled pending the approval of a new animal control ordinance being drafted at the time.

The animal control ordinance passed earlier this year, and Roof's request went back on the council's agenda.

The matter was discussed at the June 15 council meeting and tabled until the next regular meeting. Roof did not appear at that meeting, so the item was tabled again. Council members requested that Roof attend the next meeting or send a representative.

Roof was again not present at Tuesday night's meeting. Council members voted that the item be stricken from the agenda, citing their lack of ability to legally grant a variance under the new animal control ordinance.

On a related matter, Pennie Nichols asked council to clarify their intent of a six-month period during which no fees would be charged for the registration of pets within the city.

Council members agreed their intent had been for no fees whatsoever to be charged for a 180-day period in an effort to promote the registration of all animals dwelling inside the city.

Nichols pointed out that renewal fees are being charged by animal control officers. Public Safety Director Jerry Guillory confirmed that as fact, and agreed to instruct animal control officers to stop

charging the fees for the remainder of the 180-day period and to refund any fees that have been charged.

AISSD seeks Jarvis Field

Tom Brace, chairman of the parks and recreation board, told council members he had been approached by athletic director for AISSD, Gene Phillips, about the school's need for practice fields.

Brace suggested that since substantial activities have not been developed for Jarvis Field, located next to the Azle Junior High School on Lakeview Street, council could consider a long-term lease or transfer ownership of the field to the AISSD.

Jarvis Field was given to the Lions Club many years ago with several stipulations. It must retain the name "Azle Lions Club Baseball Field" donated by Dan Jarvis, and is to be used as a recreational ball field by the city's youth and young adults.

Council members requested that Phillips attend the next regular city council meeting to answer any questions and that the item be placed on the action agenda for that meeting.

Semi-pro team seeks Azle home

Mayor Shirley Bradley reported that she met with a representative of the Avengers Football Club, a semi-pro football team, recently. The Christian team does not receive any profits, donating all gate money and fees back into the city and schools.

Representatives of the team, who wish to claim Azle as their home city and be known as the Azle Avengers, will attend the next regular city council meeting to make a presentation, Bradley said.

Texas water crisis one of biggest in recent history

Texas A&M Agricultural Extension Service

Texas is facing one of its biggest water crises in recent history. From the High Plains to the Rio Grande Valley, Texans are being asked, or ordered, to conserve water. Some need to lengthen the life of a limited water supply. Others have adequate short-term water supplies but must conserve to ease over-burdened water suppliers.

Drought conditions statewide have only added to the problem, and recent scattered rain showers have done little to lessen water woes.

"When we get into dry conditions, people start using more water than water systems are designed to deliver to homes because they use extra water for their landscape and their housing needs," said Dr. Bruce Lesikar, agricultural engineering program leader with the Texas Agricultural Extension Service. "One good way to alleviate this demand is to practice water conservation."

Water conservation measures, both voluntary and mandatory, are being practiced across the state as drought conditions make the need for conservation evident.

In the Rio Grande Valley, the Falcon and Amistad Reservoirs are at 22 percent of their capacity, their lowest level since the 1950s. Citizens there are under mandatory conservation measures.

Temporary water permits in the Colorado and Brazos River Basins have been suspended indefinitely by the Texas Natural Resource Conservation Commission (TNRCC). Twenty three temporary permit holders have been notified to cease diverting water to protect the rights of the senior and superior water right holders, said Shana Bagley of the Water Rights Permitting Team of TNRCC.

San Antonio and surrounding areas that rely on the Edwards Aquifer for water have enacted Stage 2 of their drought response plan which limits landscape watering to two days per week. San Antonio is not alone.

One hundred twenty-two public water systems in Texas are currently limiting water use to avoid shortages, according to TNRCC. Most of the systems are under a "watch" which means that the water system has instituted rationing due to excessive demand but is not in danger of loss of supply at this time.

Not all of the rationing is because of an impending shortage. In northeast Texas, for example, more than 30 systems have had to resort to either mandatory or voluntary rationing due to high customer demand, according to the TNRCC. The problem is not that these areas are running out of water but that customers have such a high demand for water in these dry times that water suppliers cannot keep up.

"These are smaller, rural systems that just don't have the capacity to meet demand at such high levels," said Tom Kelley of TNRCC. "These smaller systems are having equipment failure just trying to keep up."

When demands overburden the distribution systems, excessive pressure loss can be experienced which leads to certain problems including the presence of bacteria. Customers on some systems have been notified by their water suppliers to boil water if the system has experienced excessive pressure loss.

"The water systems designed for communities are generally established for a certain volume of water for each household. When we look at our water supply systems, we have to consider the size of the piping that supplies water to the homes, the treatment capacity of the water plant and the raw water delivery system such as water wells or intakes in surface water supplies," Lesikar said.

"So, when we get into these periods of time where we are trying to use more water - such as the drought that we are in - we use more than the average capacity that the system was designed for, and you start seeing reduced pressures in the home," Lesikar said.

"Also during periods of high water use when the water system is operating at full capacity, having to shut down a component for routine maintenance can result in decreased supply."

Although some areas of Texas currently have adequate water supplies due to wet weather conditions this past winter, continued use of large volumes of water with limited rainfall to replenish these supplies can push the state into a water shortage, Lesikar said. Diminished water supplies will lead to rationing due to limited supply rather than the overloading of the supply system.

Water conservation methods can ease the burden on water suppliers and lengthen our supplies for the future. Conservation practices make good sense all the time, especially in times of drought. Lesikar offers the following common sense ways to limit water usage around homes.

- Inside the home, make sure that you have low-flow shower heads, low-flow toilets and sink aerators. It only costs about \$25 to install water-conserving devices that will save money on a monthly utility bill. When doing dishes or laundry, make sure to wash only full loads so that water is not wasted.

- When watering outside, provide enough water for plants to make it through this drought, but avoid excessive water use. Water at times when it is cooler so that the water will not evaporate. Most cities that

These are smaller, rural systems that just don't have the capacity to meet demand at such high levels," said Tom Kelley of TNRCC. "These smaller systems are having equipment failure just trying to keep up."

radiation require that watering be done between 8 p.m. and 10 a.m.

- If you must wash a vehicle, do it in an area where water can run onto the lawn. If using a water hose, make sure that you turn off the water or use some type of spray unit that regulates the flow so that the hose does not continue to run while you wash the vehicle.

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08-04-98
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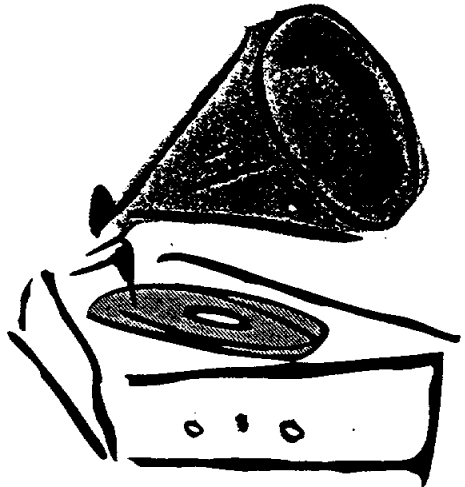
Volume 9, Issue 30

<http://www.community-news.com>

July 23, 1998

Burn ban continues

The Parker County Commissioner's Court has extended the county-wide burn ban until July 27. The ban prohibits all outdoor burning, and provides for penalties if the ban is violated.



Broken Record Department

It's too hot and there's not enough water.

Kelly C

The Community News

TEAGUE NALL & PERKINS
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Serving Eastern Parker County: Aledo ★ the Annettas ★ Hudson Oaks ★ Willow Park

Volume 9, Issue 30

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July 23, 1998

Aledo experiencing record water use despite rationing

by Margaret Wintersole

Aledo residents are obeying the water rationing instituted by the city, according to water department officials.

Like many area towns, Aledo has instituted Stage 1 water rationing because of the relentlessly hot, dry summer.

At Aledo's regular city council meeting July 16, Lloyd Stafford, area manager for Severn Trent Environmental, reported that no resident broke the rationing program during a recent 6 to 8 p.m. check.

In response to Stafford's report, Mayor Bob Lewis said residents' cooperation showed a sense of community.

Even with rationing, however, Aledo is experiencing record water use. Stafford predicted water customers will use more than 7 million gallons of water this July, putting added stress on the city's already taxed wells.

If the city goes to level-two rationing, it will ban all outside watering.

Mayor Lewis also reminded citizens that the burn ban continues.

New business

Under new business, the council considered funding firefighters, renewing a franchise with Southern Union Gas, retaining Southwest Consultants and budgeting for the 1998-99 fiscal year.

The council voted unanimously to provide funding for two Aledo Volunteer Fire Department firefighters to attend firefighters school.

Mayor Pro Tem Willie Evans moved to pay training expenses up to \$1,100 for the firefighters.

Mayor Lewis explained that the city supports the department by paying electricity, gas, water and telephone bills for the Aledo fire hall and by setting aside \$2,500 annually for training and equipment.

After the vote, Lewis added that he would propose tying Aledo's financial support to the growth of the city for next year's budget.

"Our town has been growing quite a bit," Lewis said, "and our budget has remained flat. It's not fair to them, and it can be dangerous to us."

The council then discussed terms for a franchise agreement with Southern Union Gas, which expires in the next two to three weeks. The council came to a consensus on a 15 year agreement with a three percent fee paid annually.

Since the council had other franchise issues to consider, it tabled the item for further study with the city attorney.

On the third item, the council considered retaining Southwest Consultants to aid the city in seeking matching fund grants for parks and recreation areas. Southwest Consultants has previously helped

the city in attaining other grants. Council members tabled action on the item.

As part of the city's effort to attain park land, the mayor informed citizens that he, Councilman Keith Kubosh and City Administrator Red Fickett informally discussed bringing the Aledo Community Center under the city's ownership with the center's Board of Directors at the board's annual meeting July 9.

On the final item under new business, Lewis provided preliminary figures on the 1998-99 budget. The council took no action.

In other business, the council approved the consent agenda. The agenda included minutes for the June 18 regular meeting, accounts payable, financial/budget report and the water/wastewater report.

Water study meeting scheduled for August 4

The Parker County Utility District Number 1 will hold its second public meeting (50% completion) relating to the Southeastern Parker County Water Study. The meeting is scheduled for Tuesday, August 4 at 7 p.m. in the City of Willow Park Council Chambers at 101

Stagecoach Trail in Willow Park.

The meeting present preliminary findings related to current water supply sources, current demand and projected demand through the year 2030. Proposed alternatives to supply and distribute water will also be discussed.

Public comment from southeastern Parker County residents is desired.

All interested persons are encouraged to attend. For additional information, contact Kelly Carta of Teague Nall and Perkins at 817-336-5773.

Burn ban extended

Both Parker and Tarrant counties have extended county-wide outdoor burning bans one more week.

Parker County Judge Ben Long Monday morning once again signed a proclamation declaring a burn ban based on "the imminent threat of disaster from wildfire..." The ban will be in effect until July 27 — the next time commissioners will consider the issue.

Tarrant County Commissioners signed a similar proclamation Tuesday. The Tarrant County ban is extended until July 28. Commissioners will review conditions again at that time.

Fire officials from both counties said first offenders will receive a written warning. Second and repeat offenders will be cited and required to pay fines. The level of the fines varies with county to county.

Jeff Edwards, Parker County fire marshal, said fines can reach as high as \$1,500 and could mean up to 180 days in jail.

The burn ban does not pertain to outside grilling, as long as there is some cooking taking place, Edwards said.

Edwards told Parker County Commissioners Monday that conditions have not improve since May.

"We've been fortunate we've only had a few fires that were easily handled," he said.

Tarrant County Fire Marshall Randy Renois said offenders can receive a citation each day they burn during the ban. Each citation is a Class C misdemeanor, he said, and can cost up to \$500 each.

As of Tuesday, 167 Texas counties have restricted outdoor burning — about two-thirds of the state's counties. More than 5,950 fires have burned more than 275,500 acres in the state since May 1.

WATER RESTRICTIONS

Water line break tough to prevent, tougher to predict

Conditions that caused Thursday's rupture could occur "just about anywhere in the system."

By BILL HANNA
Star-Telegram Staff Writer

FORT WORTH — The cast-iron water line that ruptured Thursday night dates to the 1930s, but city officials said its failure could not have been foreseen and would have been difficult to prevent.

"We have tried to do a better job of predicting these types of things, but it is almost impossible to say where it's going to happen," said Dale Fisseler, deputy Water Department director.

This could happen just about anywhere in the system.

Dry conditions, combined with high water pressure, were believed to have caused the 36-inch line to break, flooding the North Holly pump station with millions of gallons of water and reducing the city's capacity by 80 million gallons.

"It just split in half," Fisseler said.

Although the water line was repaired yesterday, the North Holly Water Treatment Plant will be out of commission until at least Monday.

Eight pumps were flooded in the deluge and must be taken apart, cleaned and then heated to remove all moisture.

"They're wet, they're saturated

with water," said Ron Widup, vice president of Sberco Industries in Dallas, the company Fort Worth hired to clean the pump engines.

"What we do is take them apart, bake them, reassemble, replace the bearings and test them. We should have them all back by the end of the weekend."

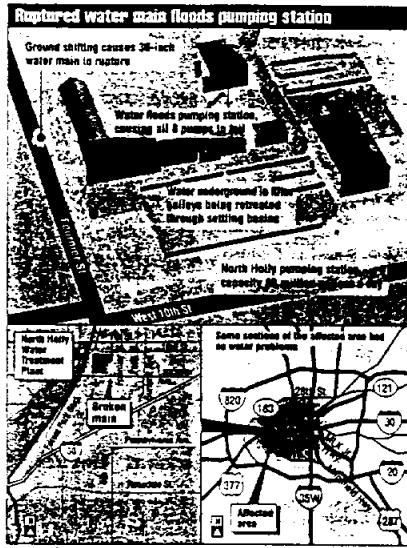
The flood water also damaged equipment installed in the plant in 1993. City officials had no damage estimate yesterday but said they could operate with older, manually operated equipment.

This is not the first time water has flooded the treatment plant, which was constructed in a series of projects between 1891 and 1954.

In 1949, flood waters from the Trinity River knocked the plant, which was the city's primary source of treated water, out of commission for several days. The drought of the 1950s also strained water resources, prompting the building of lakes to ensure Fort Worth and Tarrant County a reliable water supply.

And on Dec. 15, 1974, in a scenario remarkably similar to Thursday night, a 36-inch water pipe came loose and flooded the North Holly pump station. That event cut off water to much of downtown and the Hospital District.

Because that water break happened in December, demand was not as high and it did not put the same strain on the water system.



Fort Worth recently completed improvements at the South Holly station and is building a sewage transmission line from its Rolling Hills Water Treatment Plant.

And on July 1, the bid process was opened for a project to double the capacity of the Eagle Mountain Lake water treatment facility, from 30 million to 60 million gallons.

Water Department spokeswoman Mary Gagliuzza said, "We try to build redundancy

into the system, but that costs money," Fisseler said. "That is why the South Holly station was built after the 1949 flood, and that is why we are continuing to upgrade our systems."

Before the water line break, Water Department director Lee Bradley said North Holly needed rehabilitation at a cost of \$25 million to \$30 million in five to seven years to meet state and federal guidelines.

Jack Z. Smith contributed to the report.
Bill Hanna, (817) 398-7498
320,057

Water shortage limits productivity in high-rise offices

By KIERSTAN GORDON
AND BILL W. HORNADAY
Star-Telegram Staff Writers

FORT WORTH — Some restrooms wouldn't work, and with no water to chill the commercial air conditioners, the temperatures soared in at least six downtown high-rise buildings yesterday morning.

For some employees, that meant a day off as businesses reacted to a water main break that forced Fort Worth and 25 of its water customers to ban outdoor water use at least until Monday.

Tandy Corp. gave most of its 2,800 employees the option to go home when inadequate water pressure affected the air-conditioning system for its twin 19-story office buildings, media relations manager Ron Trumbula said.

The City Center towers were also affected, as were Continental Plaza and Burnett Plaza, where about 10 of the building's 33 companies closed.

Deloitte and Touche closed its offices in City Center Tower II, but many of its 55 workers used laptops and worked from home.

Other major downtown employers that closed included Pier One, Harcourt Brass College Publishers, Price Waterhouse Coopers and Union Pacific Corp.

Most of the buildings were back to normal by early afternoon.

One casualty was the skating rink at Fort Worth Outlet Square. Compressors at the rink use water, which was more urgently needed by the building's air-conditioning

system. Trumbula said the rink was expected to reopen today. Most retail stores stayed open, including shops and restaurants in Outlet Square.

As concern about the water main break spread, some businesses in other cities that get water from Fort Worth water also began reducing usage. In Halton City, Ontario, Public Works Director Channing Kendrick asked one of the city's heaviest water users, Liberty Chevrolet, to take additional conservation measures.

"They said they would do anything they can as long as it doesn't affect production, which is above and beyond what we've asked them to do," Kendrick said.

A gray area in Fort Worth's conservation request is how car washes will be affected. Fort Worth wants all its outdoor car washes that do not recycle water to cease operations during the weekend. However, the city does not know how to enforce the request because it is difficult to distinguish which car washes use recycling systems, said Rodney Rafter, public education specialist for Fort Worth's Water Department.

Similar decisions outside the city are up to individual customers, he said. For now, cities such as Waco, Keller and Halton City plan to allow their car washes to do business as usual, city officials said.

Bill W. Hornaday, (817) 683-3884
Kierstan Gordon, (817) 398-7725

Fort Worth Star-Telegram

www.star-telegram.com

SATURDAY, JULY 25, 1998

TARRANT COUNTY, TEXAS "Where The West Begins"

50 CENTS

Water use limited to necessities

Fort Worth pumps expected to be back on line by Monday

By CHRIS VAUGHN
Star-Telegram Staff Writer

FORT WORTH — Fort Worth and 25 of its area customers yesterday imposed mandatory outdoor water restrictions until Monday after a catastrophic water main break hobbled the huge delivery system.

The fracture of a 36-inch water main that feeds much of the central city and the flooding of the North Holly pumping station and water treatment plant reduced the city's capacity to deliver water during the area's second-hottest summer on record.

With no water to chill commercial air-conditioning units, it also made for a long hot night for patients in Medical District hospitals and guests at downtown hotels. The emergency also prompted thousands of government and corporate employees to dismiss employees on what turned out to be the 19th consecutive day of 100-degree temperatures.

The city estimated that the break affected 100,000 people for varying lengths of time. Even though one top official declared Thursday night's water main failure one of the city's worst water disasters in modern history.



Star-Telegram/Ron T. Brown
City workers begin repairing a 36-inch water main that ruptured Thursday night. The job was completed about 3:30 p.m. yesterday.

Water

From Page 1

history, a number of people breathed a collective sigh of relief that it didn't occur in the afternoon.

"For us, there is no perfect time for it to happen," said Laura Van Hoojer, a spokeswoman for Harris Methodist Fort Worth hospital, which went without water and air conditioning for nine hours. "But thankfully, it was during the middle of the night and the city fixed the problem fairly quickly, so we were able to begin the day with a pretty normal operation."

The water main break occurred on Fournier Street just west of downtown about 10 p.m. Thursday, and repairs were completed about 3:30 p.m. yesterday. Although the break was large, it probably would not have been serious except that escaping water flooded pumps in the pumping station and water treatment plant next door.

And that affected the distribution of about 80 million gallons of water a day that the North Holly plant distributes to downtown Fort Worth, the Medical District, down to about Berry Street, north to 28th Street and west to the Naval Air Station.

Dale Fisseler, deputy water director for the city, said he would put the incident as the third- or fourth-worst water-related problem in modern history, ranking somewhere behind the 1949 flood and the drought of the mid-1950s.

City officials suspect that the cast-iron pipe snapped under prolonged stress from water demand and the shifting of dry, cracked soil.

"It's not unusual to have a water main break in the summer," said Pat Svacina, a city spokesman. "What's so different about this was that it was next to a pumping station. It got elevated from a routine water main break to a distribution problem."

Until workers can dry out and clean the eight pumps and get the treatment plant back on line, the other pumping stations will remain under greater stress than usual.

"Fixing the line will help the system in terms of pressure, but we still have a problem with capacity," Fisseler said. "We



Special to the Star-Telegram/Jerry Lewis
Employees of Sherman Industries work to disassemble, clean and bake dry the pump motors at North Holly pumping station.

know we've got enough for domestic use and fire protection, but if people irrigate, we think it will jeopardize the system."

As a result, Fort Worth and the 25 municipalities and other entities to which it provides water use have banned outdoor water use such as watering lawns, filling pools or washing vehicles until at least Monday. They also encouraged cautious use of water indoors.

Although officials urged voluntary compliance, the Water Department can cut off water to people who violate the ban.

"It appears that everything will be back to order by early next week," Mayor Kenneth Barr said. "I don't think anybody will lose a lot of grass or shrubs in this period of time."

Svacina said city officials hope to keep water use to about 240 million gallons a day, down from the 275 million gallons averaged the past few weeks.

"Washing clothes, taking a shower, washing dishes — those do not create peak demands like when people come home and turn on those lawn sprinklers," he said.

Most of the smaller cities and water companies supplied by Fort Worth acted swiftly to issue notices of water restrictions after Fort Worth asked them to cut back about 10 percent. Many



Special to the Star-Telegram/Sandra D. Cook
Darren Engelhart, plant engineer at Cook Children's Medical Center, checks the fire hose feeding water from an Everman Fire Department pumper truck to the hospital's air-conditioning cooling towers.

were posting signs, putting notices on cable TV channels, mailing fliers to residents and going door to door to alert people.

"They haven't said they would send us any less. They just asked us to cut back, and we have obliged them," said David Vestal, Forest Hill's city manager.

Sansom Park, which only started buying Fort Worth water this month to supplement its wells, is beginning its own rationing program after Monday, with residents at even-numbered addresses watering on even days

and odd-numbered addresses on odd days.

Dallas/Fort Worth Airport, which usually consumes 5.8 million to 6 million gallons per day, watering and "will rely more on Dallas water until the emergency subsides in Fort Worth," spokesman Joe Dealey said.

Most of the people who receive water from the North Holly plant probably experienced short-term problems, city officials said, but downtown and the Medical District took longer to recover.

It was about 7 a.m. before Harris Methodist began receiving water again and between 5 and 6 a.m. at Cook Children's Medical Center, both of which use water to cool their chiller air conditioners.

Neither hospital reported any emergencies, just some discomfort among patients and employees. Fire departments in Fort Worth, Burleson, Everman and Rendon provided water to help the chillers at Cook Children's, but Harris Methodist's chillers are too large for that type of temporary fix, officials said.

Nurses at both facilities used fans, bottled water, ice and wet towels to keep patients comfortable.

At All Saints Episcopal Hospital, firefighters pumped 8,000 to 10,000 gallons of water onto the air-conditioning cooler towers to keep the system operating.

Drenda Witt, spokeswoman for John Peter Smith Hospital, said the water main break had no effect at the medical center's South Main Street location but caused a loss of water pressure at the Diamond Hill facility. That facility's air conditioning was inoperative for a couple of hours, she said.

As the sun rose and thousands of downtown workers poured into hot office buildings with no working bathrooms, managers and executives began sending some of the lucky ones home early, including employees from the Tandy Corp., Harcourt Brace book publishing in City Center II and the Pier One offices.

Although water pressure was returning to normal in Tarrant County buildings by mid-morning, the inside temperatures were deemed too high to continue working, County Judge Tom Vandergriff said.

He sent all county employees home at 11 a.m., with the exception of those in the jail, security and data services departments. The district attorney's office, however, didn't wait that long.

"I realized there was a problem when I couldn't fill up my coffee pot," said Richard Alpert, chief of the misdemeanor division. "I knew it was going to be a bad day."

A number of the taller buildings had cooled off by midday, but early yesterday, security guards were dissuading people from taking the elevators in the 32-story Chase Texas Tower and

Areas affected by water restrictions

- Here are the buildings that buy water from Fort Worth and are under outdoor watering restrictions:
- Bathesda Water Supply Corp.
 - Burleson
 - Crowley
 - Dallas/Fort Worth Airport
 - Dawson/Whittington Gardens
 - Edgecreek Village
 - Everman
 - Forest Hill
 - Haltom City
 - Hastlet
 - Hurst
 - Keller
 - Lake Worth
 - North Richland Hills
 - Richard Hills
 - Roadfork
 - Saginaw
 - Sansom Park
 - Southlake
 - Tarrant County Municipal
 - Utility District No. 1
 - Trophy Club Municipal
 - Utility District No. 2
 - Watauga
 - Westover Hills
 - Westworth Village
 - White Settlement

the 38-story City Center II.

"We were trying to discourage people from going to their offices for their safety," said M.G. Smith, project manager of the City Center towers. "We were very concerned about the elevators because of the heat in the building. We were worried that it could affect the motors."

The problem even reached the ice skating rink at the Tandy Center, where the surface was empty and a bit soupy yesterday morning. Rink employees said they turned away quite a few customers, but 11-year-old Kim Kortvohann learned about the rink the hard way.

"It covered my whole blade," said Kortvohann, referring to the water that had settled on the rink.

Units Baker, Elizabeth Campbell, Gabriela Cruz, Kierstan Gordon, Bill Hanson, Nichole Hawkins, Laurie Mark, Jack Z. Smith and G. Chambers Williams III contributed to the report.

Chris Vaughn, (817) 398-7547

CITY FINAL
 IN SPORTS: Minnesota Twins beat the Rangers, 5-3....PAGE 1D
Fort Worth Star-Telegram

SATURDAY, JULY 25, 1998

www.star-telegram.com

Tarrant County, Texas "Where The West Begins"

50 CENTS

LOW MOON

A comparison of weather between this year and 1980, when the Mesquites had 65 days of 100 degrees or above, including 42 consecutive days from June 23 to Aug. 3.

Year	July 24 temperature	Days of 100° or more*
1998	184	32
1980	181	37

Record: 106 in 1977. Benchmark: 37.

DFW is the official reporting station for Mesquite temperatures. * as of July 24.

TODAY'S FORECAST
 Partly cloudy, hot and humid. Wind south at 5 to 10 mph.
 High 102, low 88. > Full report, Page 10C

NEED HELP?
 United Way of Metropolitan Tarrant County, 258-6100
 Tarrant County Department of Human Services, 531-5620

Water district cuts flow to Lake Arlington

BY ANITA BAKER

Star-Telegram Staff Writer

FORT WORTH — The Tarrant Regional Water District cut off water to Lake Arlington yesterday so it could boost supplies to Fort Worth after a major water main break.

The diversion will accelerate the drop in lake levels but is not expected to force Arlington into the strict weekend rationing facing Fort Worth and the 25 cities and water companies it supplies.

The increased demand on the district's East Texas water pipelines may also force the district to switch to more costly backup pumps earlier than expected, a move that may translate into

increased water rates next year for most of Tarrant County, said water district spokesman Mike Williams.

"If we do not get some rain to help out in increasing levels of Lake Arlington, it will be inevitable," Williams said.

Without rain, he said, the district may need to activate a less energy efficient booster station in Ennis by Aug. 3.

Water from the district's two East Texas lakes — Cedar Creek Lake and Richland-Chambers Reservoir — feeds Lake Arlington and Fort Worth's Rolling Hills Water Treatment Plant. The downtown Fort Worth North Holly pumping station, damaged by the major water

main break Thursday night, is fed principally by water from Lake Bridgeport, Eagle Mountain Lake and Lake Worth.

Williams said the district is sending about 170 million gallons of water a day, including 30 million to 40 million gallons that normally would go to Lake Arlington, to Rolling Hills for treatment to cover the loss from the North Holly plant closure.

Chuck Volzes, water treatment manager at the Pierce-Burch plant in Arlington, said the drop in lake levels will not cause the city any problems.

Trevor D. Hobbs contributed to this report.
 Anita Baker: (817) 398-7428
 abaker@star-telegram.com

TODAY: GRANT PROGRAM TO BRING RUBBER BOUNCING INTO WEATHERFORD

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DAILY WATCH

WEATHER (AP) — Heat advisory in effect through Wednesday. Afternoon heat index values 95 to 115 degrees. Tonight, low with a low in the lower 80s. Wind 5-15 mph. Tuesday, mostly sunny and hot with a high of 104. South wind 10-20 mph. Extended forecast, Tuesday night through Friday, partly cloudy, hot and mostly clear, warm nights. Lows around 80. Highs 95 to 106.



DALLAS (AP) — In Texas, it's even when the sun isn't shining. The 82-degree low on Sunday morning was the 24th time this year that the low temperature is not below 80, according to the National Weather Service. The old record of 23 was set Saturday. The low temperatures have not been this high since 1980's infamous hot summer, when the thermometer hovered above 80 for 22 days. That kind of sustained heat, without any respite in the morn-

Stock ponds, tanks quickly drying up



For area cattle, this summer's drought is not only uncomfortable — but dangerous as well. Stock ponds and tanks are quickly drying up. Even worse, the water at its lower levels stagnates. This is part of the reason President Clinton has granted disaster aid to all Texas counties where farmers and ranchers are being so hard-hit by drought conditions.

Democrat Photo by Brad Michael Moore

Parker County may benefit from tobacco lawsuit

See page 2A

Boosters continue raising funds for band's London Trip

See page 9A

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Azle News

50¢

Thursday, July 30, 1998

Volume 47, Number 5

28 pages plus supplements

Azle, Texas 76020

Burn bans extended

More bad news about the weather left Parker and Tarrant county officials once again with no choice.

Outside burning bans in both counties have been extended one week.

Parker County Judge Ben Long Monday morning once again signed a proclamation declaring a burn ban based on "the imminent threat of disaster from wildfire..." The ban will be in effect until Aug. 3 — the next time commissioners will consider the issue.

Tarrant County Commissioners signed a similar proclamation Tuesday. The Tarrant County ban is extended until Aug. 4. Commissioners will review conditions again at that time.

J.D. Johnson, commissioner for Tarrant County's precinct 4, said ban could continue indefinitely.

"We will keep this going, I can assure you, until we get some rain," he said. "It's like having the powder and waiting for something to happen."

Fire officials from both counties said first offenders will receive a written warning. Second and repeat offenders will be cited and required to pay fines. The level of the fines varies with county to county.

Jeff Edwards, Parker County fire marshall, said fines can reach as high as \$1,500 and could mean up to 180 days in jail.

The burn ban does not pertain to outside grilling, as long as there is some cooking taking place, Edwards said.

Edwards said most people seem to remember all too well the Poolville fire that destroyed thousands of acres in 1996. That fire was started by outdoor burning on a windy day.

"We've had excellent compliance so far," he said.

Tarrant County Fire Marshall Randy Renois said offenders can receive a citation each day they burn during the ban. Each citation is a Class C misdemeanor, he said, and can cost up to \$500 each.

Renois said grass fires in Tarrant County "are continuing to increase in numbers and size each week."

Subsequently, all fire departments have been placed on alert due to the "deteriorating weather conditions," Renois said.

Parker County had a scare of its own this past weekend.

Low humidity and record-setting heat is being blamed for a grass fire which burned about 500 acres near U.S. 180 West. A spark from a passing Union Pacific Railroad train touched off the fire. The fire started along the tracks and spread to surrounding pastures.

Firefighters from Poolville, Central, Weatherford, Adell-Whitt and other precinct fire departments fought the blaze.

Recent reports show that 167 Texas counties have restricted outdoor burning — about two-thirds of the state's counties. More than 5,950 fires have burned more than 275,500 acres in the state since May 1.

Parker County may benefit from tobacco lawsuit
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Boosters continue raising funds for band's London Trip
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Thursday, July 30, 1998 Volume 47, Number 5 28 pages plus supplements Azle, Texas 76020



50¢

Drought of 1998 leaves Texas, Texans high and dry

Drought is nothing new to Texans. As Junction native Rana Williamson points out in her wry little book, *When the Catfish Had Ticks*, this summer's dry conditions are part of a "cyclical, meteorological struggle dating back to the 15th century, when an early occurrence destroyed the Amelope Creek (community), a native culture on the Canadian River."

Her book is a charming compilation of homespun humor related to the weather. It is a recommended read for anyone who finds consolation in Texas wit, such as: "It was so dry in Jones County, the trees started chasing the dogs."

But familiarity with drought doesn't make it any less painful for the farmers and ranchers who have been left high and dry.

The Texas Agriculture Extension Service estimates Texas' loss in hay production will cost \$175 million statewide this summer. The loss of direct income to agriculture producers totals \$517 million so far, with cotton producers having experienced an

estimated loss of \$157 million. People all across the state are hurting.

This situation requires that we immediately bring into play all existing federal government resources that can be of help. On June 23 I alerted Agriculture Secretary Dan Glickman to the extremely hazardous conditions that Texas is experiencing this summer, and asked that he release Conservation Reserve Program (CRP) acres to provide Texas farmers and ranchers with emergency drought assistance.

This drought is more than an agricultural disaster. Insufficient rain/fall across Texas has resulted in extreme fire conditions in 207 of Texas' 254 counties. And the National Weather Service is predicting above-average temperatures and no precipitation for much of the state through the summer.

We've all seen what this summer's horrendous wildfires have been doing to Florida. We don't want a repeat of that scenario in Texas.

Federal assistance is now making available several programs to help Texas firefighters, farmers and ranchers prevent conditions from deteriorating further. Emergency loans, CRP

haying and grazing, and crop insurance are some of the important tools that could do more to assist our producers.

Earlier this summer, at my request, the U.S. Department of Agriculture's Risk Management Agency agreed to delay making some proposed changes in the way crop insurance policy claims are appraised on seed that fails to grow due to a lack of rain. The original appraisal period, seven days, remains in effect. The agency's draft regulation would have deferred these appraisals to 25 days after the final plant date, a proposal that worried many growers.

In a Senate Resolution offered in June, Secretary Glickman was instructed to:

- Ensure that local Farm Service Agency offices are equipped with adequate personnel in drought-stricken areas to assist producers with disaster loan applications;
- Direct the U.S. Forest Service to assist the State of Texas and the Federal Emergency Management Agency in pre-positioning fire-fighting equipment and other appropriate resources in affected Texas counties;
- Authorize haying and grazing on CRP



GUEST COLUMN

Kay Bailey Hutchison

acreage (so far 35 counties have been released for grazing only);

- Implement an emergency plan to help prevent wildfires.

As is the case during any drought, all Texans have a stake in its outcome. While farmers and ranchers are feeling the pinch now, over the long term everyone will suffer the consequences in the grocery store check-out line and elsewhere in our economy. While the possibility of wildfire presents an immediate threat, over the long haul drought can depress property values, reducing the tax revenues on which school districts and local governments depend. And inevitably, drought increases the competition for scarce water resources among municipalities, agriculture and wildlife preservation efforts.

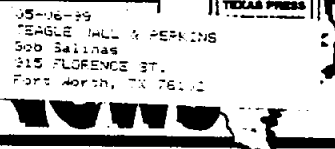
There's an old joke that says the success of a "Rainmaker" depends on his timing. We can't change the weather. But what we can do is work together, as Texans always have, to limit the damage wherever we can.

For more information on the programs mentioned in this column, contact the Texas Department of Agriculture at (877) 429-1998, toll-free.

Kay Bailey Hutchison is a U.S. Senator from Texas

Doug V. / Kelly C.

The Community News



Serving Eastern Parker County: Aledo ★ the Annettas ★ Hudson Oaks ★ Willow Park

Rain helped some - water rates will help more

Dear Editor:

Two important events occurred on Friday [July 17] that should have a significant impact on Willow Park.

1. The Squaw Creek Steakhouse had its grand opening, and
2. It Rained.

Just how significant these events will be remains to be seen, but they are a definite start in the right direction. Willow Park has needed a good family restaurant that is reasonably priced and in an attractive setting for a long time. With this enterprise plus a few more commercial operations, the City of Willow Park could reduce or eliminate the citizens' tax burden.

We can't expect that Squaw Creek Steakhouse and Squaw Creek Downs will ever be able to provide the income to the City that Trinity Meadows Raceway provided, but a few more retail enterprises will help the city tremendously.

And of course, it RAINED. It was very enjoyable to watch the rain during dinner at Squaw Creek. Some of the city received more than others, I heard from almost two inches in the southern part of the city to a few tenths at my house, but it was wonderful while it lasted.

Unfortunately a little rain won't solve the mayor's water problems. Until the mayor gets serious about solving the water problems for the whole city, we shouldn't expect inadequate conservation measures to have much impact. About a year ago I suggested that the Water Rates be adjusted to bring our water rates in line with surrounding communities. This would also decrease the water charges for those citizens that practice conservation of their water resources and increase the water charges for those that do not.

Ken Fisher

Doug V. / d
Kelly C.

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The Community News

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Serving Eastern Parker County: Aledo ★ the Annettas ★ Hudson Oaks ★ Willow Park

Volume 9, Issue 31

<http://www.community-news.com>

July 30, 1998

Aledo restricts watering hours

In order to maintain an adequate water supply, the City of Aledo is restricting outside water usage to 8 to 10 a.m. and 8 to 10 p.m.

The odd/even watering days remain in effect.

The precautions are necessary to preserve the production capacity of the water wells and pump equipment. Because of the extended drought, unprecedented demands have been placed on the wells and pumps.

City officials thank residents for their continued cooperation and compliance.

4/10
Kelly C.

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The Community News

Serving Eastern Parker County: Aledo ★ the Annettas ★ Hudson Oaks ★ Willow Park

Volume 9, Issue 31

<http://www.community-news.com>

July 30, 1998

Tuesday afternoon fire chars Aledo ranch land

by Christopher Amos

The familiar smell of grass fire filled the air in east Parker Country as a swift wind hurried flames across a section of the D Bar B Ranch Tuesday afternoon. The fire was reported just after 5:00 pm and the call for reinforcement went out almost immediately as flames swept the hill land less than a mile from Aledo.

Ranch hands fanned out across the bumpy terrain in pickup trucks to herd cattle and donkeys out of the path of the flames. One herd was relocated just ten minutes before the fire consumed the trees where the livestock had been enjoying a rest in the shade.

By six thirty the fire had passed over about thirty acres and was still being battled by firefighters from several local departments. The blackened hills could be seen for miles smoldering just southwest of Aledo.

"We may be here into the night," said independent firefighter Danny Mallard, while washing his blackened face with a fire hose. Mallard is a local business owner that purchased his own professional equipment to fight fires in cooperation with area fire department. "Me and my wife... this is our way of giving back to the people."

Other volunteers offered help and filled the drained fire trucks by hand from a water reserve. By 8:15 the sun was setting and all departments were still busy dousing the flames, but the worst appeared to be over. At press time Tuesday evening firefighters were still fighting the fire. Updated details will be posted to our web page at [community-news.com](http://www.community-news.com).

Don't
Kelly

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TEXAS PRESS

The Community News

Serving Eastern Parker County: Aledo ★ the Annettas ★ Hudson Oaks ★ Willow Park

July 30, 1998

Volume 9, Issue 31

<http://www.community-news.com>

Water occupies Willow Park council meeting

Water occupies Willow Park council meeting

by Margaret Wintersole

Changes to the Willow Park Emergency Water Rationing Plan added a \$50 to \$500 fine for rationing violators.

The amended plan also eliminated placing restrictors in water lines to limit violators' water use.

The Willow Park City Council voted to amend the plan at its regular meeting July 21 to provide the city with a more effective ordinance.

The city has had a fine for violators in the past. But, in an interview after the meeting, City Administrator Guy Natale said that putting the fine in the amendment rather than referring to a general fine in the Code of Ordinances preamble would prevent challenges to the fine.

In addition, Natale said the amendment eliminated flow restrictors because they did not accomplish the goal to limit usage since violators would allow their water to run for longer periods of time.

Water Rates

On a second water issue, the council considered establishing an escalating water rate procedure.

Such a procedure would charge a base rate for a specified amount of water. The city would then set additional graduated fees for any usage above that amount.

For example, for each 1000 gallons up to 30,000 gallons, the city might charge \$2.50, for usage up to 45,000 gallons \$2.75 and up to 60,000 \$3.00.

Mayor Les Cooley emphasized that increasing water rates was not the intent of establishing an escalating water rate.

"Our water system is not hurting as far as money...The intent of an escalating water rate is conservation."

The mayor mentioned that to get any future state help with obtaining a surface water supply the city must show some method of conservation.

Resident Sue Higdon asked if the rate was a technicality to get state aid.

Councilman Martin responded, saying, "This is a conservation method, in my opinion."

Martin added, "...we should be looking at this regardless of any future interaction with the state."

"Continuing on that thought, though," Martin continued, "once we get into deciding on one of the many options being presented to us as a result of the water study we initiated last fall, we will be looking at needing, hopefully, some monetary assistance in establishing a line from one of the area lakes."

"They will look more favorably upon us if we have voluntarily instituted conservation mechanisms within our operations."

Higdon argued that average citizens would not understand the issue.

Martin suggested a town hall meeting as an open forum for discussion, which Councilman Bertling supported.

Bertling, who liked the rate idea, said, "As we've seen over the last two months, whether we impose fines or not, I think economic incentive is a much more appropriate way to try to encourage conservation of the water system."

Bertling moved to have the mayor present an escalating water rate fee structure for the city, including the analysis leading to the rate structure.

The council unanimously approved the motion.

More information from Willow Park's meeting is on page A4.

Wastewater Rates

Moving to wastewater rates, the council discussed methods for charging residential customers.

The city bills commercial wastewater rates at 100 percent of water use because most water used on commercial property goes into the wastewater system.

Residents, on the other hand, use water to irrigate their lawns especially in the summer months.

The mayor explained that charging 100 percent of water use would be unfair to residential users.

The council unanimously approved a motion by Bertling to establish an ordinance for residential wastewater rates based on either an average water usage for the previous December, January and February or, if no average exists, on 7,000 gallons usage per month.

WP Council debates road repairs, schedules special meeting

by Margaret Wintersole
The Willow Park city council debated road repairs and examined ways to fill the Board of Adjustments at its meeting July 21.

Board of Adjustments

Currently, the Board of Adjustments (BOA) has only three members but needs five.

Until more volunteers come forward, the councilmen may have to act as the BOA, the city's governmental body that reviews requests for variances to zoning ordinances.

Councilman Sam Bertling moved to have the mayor and city attorney examine the requirements necessary for the city council to act as the board.

The motion passed unanimously.

Roads

Councilman Bertling called for dedicating surplus city funds for road repair.

Bertling argued for earmarking some of the funds since, in his opinion, roads were "the number one issue on citizens' minds."

Martin pointed out that the city had a surplus because it had not spent money already allocated for roads.

"So absolutely," Martin said, "some of this money is earmarked for roads, and we ought to get on with it."

"And it doesn't appear like at least until after the November elections - we're likely to get any assistance from the county precinct."

Martin recommended deferring the discussion until the budget workshop the following week.

Summing up his views on the matter, Bertling said, "I think the city council, as a body, should express an interest and desire to expend funds from the Maintenance and Operations budget of the city in excess to those that are permanently dedicated to roads to repairing the road structure in Willow Park."

The mayor corrected the use of the word surplus.

"I hope the paper understands that the city does not in fact have a surplus penny, period. "We have means to spend those dollars wisely."

In addition, the mayor criticized past city governments, saying they "never looked to tomorrow."

"That's the reason we're in the shape we're in today."

"We have some money available. We have the possibility to have surface water."

"I'm working on the possibility of getting state roads in our city, which our attorney tells me we have to have some dollars for."

"So let's not foolishly call the little bit of money we have, which is absolutely nothing, surplus and go spending it foolishly."

"We have the money available...to fix the roads, and it's earmarked for that."

"I think through prudent spending over the last year the fact that we have a few dollars we did not spend, which is not surplus, should be spent more wisely than going out here and doing roads, which needs to be done."

"But we also need to think about our city a year or two down the road."

"A year or two down the road, we're going to need some more things."

"In order to do that, we need to save our pennies now, need to save our pennies now,

and not just go spend them because they're there. "I'm totally against it."

The council took no action on the item.

On another road item, Bertling spoke to the council about parking on Ranch House Road, which creates hazardous driving conditions, particularly at curves.

The mayor stressed a serious problem south of the highway where 18-wheelers park near the McDonalds.

Bertling moved to authorize the mayor to create an ordinance that prevents stopping, stand or parking on Ranch House Road.

The motion passed unanimously.

Appointments of City Officials

On the lighter side, the council unanimously passed a motion by Bertling to create the office of city attorney although the city has an attorney.

The mayor explained that the city did not previously have the office as described by the government code.

The council also unanimously passed a motion to appoint City Secretary Henry Haggard and City Administrator/Treasurer Guy Natale to their offices.

Haggard has worked for the city for about one year and Natale about seven years, but neither one had ever been officially appointed to their positions.

The council set 7 p.m. Tuesday, July 28, and possibly

1998-99 Budget

The council set 7 p.m. Tuesday, July 28, and possibly

Thursday, July 30, as workshop dates for the preliminary review of the 98-99 budget.

Mayor's Update

The mayor announced that the city has given permission to award a contract to install a waterline to the south side of I-20.

"Things are moving along as planned," Cooley said. According to the contract, work should be completed in 130 days.

On a second item, the mayor noted that while water rationing started out "pretty rocky," citizens have been obeying the rationing.

"Our tanks finally filled up. Our wells are getting a rest."

Cooley also said that the city plans to drill another well in the Trinity aquifer.

Citizens' Presentations

Resident Maxine Alford stood before the council to ask for their help in solving a legal issue.

Alford told the council that a prominent Fort Worth developer and his family presented a petition for annexation of land, claiming the Alford property as part of that land. The city council at that time determined the developer's claims were true and annexed the land in 1963.

The city never notified Alford of the annexation. She did not know of the annexation until the city council changed the map in 1988, showing her property inside the city limits.

Alford asked the present city council to amend the metes and bounds of the annexation ordinance.

Changes to Willow Park's Emergency Water Rationing Plan

The Willow Park City Council amended the city's Emergency Water Rationing Plan by deleting the following:

1. Upon first knowing violation, and with the concurrence of the Mayor or the Mayor Pro Tem if the Mayor is unavailable, the waterworks may install a flow restrictor in the line to limit the amount of water which will pass through the meter in a twenty-four (24) hour period. The cost to be charged to the customer's account shall be in accordance with §11.203
2. Upon subsequent violation(s), the waterworks may terminate service at the meter for a period of seven (7) days, or until the end of the calendar month, whichever is less. The normal fees to disconnect and reconnect service of the waterworks shall apply for restoration of service in accordance with § 11.204.

The council further amended the plan by adding the following:

1. It shall be unlawful to violate any term or condition imposed under the Emergency Water Rationing Plan. A customer who violates any term or condition imposed by the emergency rationing notice may be issued a citation, or for the first violation thereof, the customer may receive a written warning or citation. Each separate occurrence or day of violation shall be deemed a separate offense. Each offense shall be punished by a fine of not less than \$50 nor more than \$500.
2. Any customer who after receiving a citation or written warning may upon any subsequent violation of any term or condition imposed by the emergency rationing notice, have water service terminated. The termination shall be by the waterworks of the City of Willow Park, Texas. Termination does not require conviction in a court of jurisdiction and the dismissal, acquittal or other disposition of a citation under (1) above is not an affirmative defense. Termination of water service is in addition to any other penalty which may be imposed hereunder. The period of termination shall not exceed seven (7) days and restoration shall be as provided in Chapter 11, Article 11.204 including payment of disconnect and reconnect fees. Water utilities shall be reconnected immediately upon application to the waterworks and compliance with provisions of Chapter 11, Article 11.204. Said reconnection shall not be a defense, bar or mitigation of any offense as alleged in (1) hereof.
3. Any appeal by the customer of termination of water service to a location shall be to the Mayor upon a finding of imminent serious health risk, as required herein, may modify the period of termination that is set forth in (2) by the waterworks if provided competent, reliable written documentation of the imminent serious health risk that is life threatening and unavailability of any other adequate water source. That decision of the Mayor may be appealed by the customer to the Board of Adjustment. Said appeal shall be under the same standards of proof as set on herein.

Budget workshop and special meeting Thursday July 28, 7 p.m.

The next regular meeting is scheduled for 7 p.m. August 18, 1998.

Doyle V. / Kelly C.

The Community News

15-NE-25
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Volume 9, Issue 31

<http://www.community-news.com>

July 30, 1998

Deer Creek residents, developer reach agreement over lake use

by Randy Keck

Deer Creek developer Doyle Hanley reached an agreement with Deer Creek property owners Monday night not to pump additional water from the area lake for paving purposes.

According to residents who live around the lake, water had been pumped from the lake "at the approximate rate of 10,000 to 15,000 gallons per hour," and used by the paving contractor in road construction work in Deer Creek Phase VII.

Hanley appeared at a meeting of approximately 30 lake property homeowners Monday night to confirm that water had been drawn from the lake, but that it had been stopped pending the outcome of the meeting.

Hanley said he had a permit to pump a determined amount of water from the lake, and said that approximately 1000 barrels had been pumped, and that another 1000 barrels would be needed to complete the paving.

He also added that there was no way water could have been pumped at 10,000 to 15,000 gallons per hour with the equipment which was used.

Residents questioned both the use of the water, since the permit was for agricultural purposes, and the practice of pumping water from the lake, since an "unwritten rule" among residents around the lake had kept them from using the water in the lake themselves, and because drought conditions were already causing the lake level to drop significantly.

Hanley replied that it is very difficult to find water for paving right now, and that he did not want to take the water out of the residents' water system, since that system was already taxed due to residential use.

He did agree, however, to find another source for the water.

When questioned by resident David Walker about concerns that Deer Creek Water Works, Hanley's company, would be overtaxed when Phase VII went on line, Hanley responded that he had plans for at least three new wells in the future. The first, he said, would be drilled this fall.

He explained that the wells needed to be set some distance apart in order to reduce strain on the aquifers from which the water is drawn.

When asked why a new well could not be drilled sooner, Hanley said that right now, well drilling companies are in high demand, and that most are doing pump work to keep existing customers in water.

One resident also asked about four occasions of water outages that had occurred in the last 30 days. One of those outages was when a pump broke down. The other three, Hanley explained, were caused by such high demand that the system had to be closed down in order to recover.

He said that at peak times everyone is running low on water. He said there are some residents

who don't care about conservation, and that those few were causing the problems for everyone else.

The residents at the meeting said they wanted to work cooperatively with Hanley regarding the water system, but many felt the tone of notices which had been distributed by Deer Creek Water Works had been too adversarial.

Resident Jeff Brookshire said it might have been better if Hanley had taken a "dear friend" approach. Hanley joked that based on some of the letters he received, "friend" would be a difficult word to use.

Brookshire agreed that the residents needed to pitch in during drought conditions. Speaking to Hanley, he said "Not only do you have to do what's right, we have to do what's right."

The lake property owners will be meeting again Thursday to work toward establishing permanent guidelines for lake use.

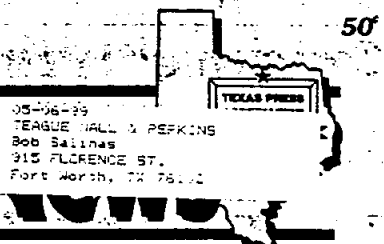
Water study meeting Aug 4

The Parker County Utility District Number 1 will hold its second public meeting relating to the Southeastern Parker County Water Study on Tuesday, August 4 at 7 p.m. in the City of Willow Park Council Chambers at 101 Stagecoach Trail in Willow Park.

All interested persons are encouraged to attend. For additional information, contact Kelly Carta of Teague Nall and Perkins at 817-336-5773.

Dary V. / Kelly C.

The Community News



Serving Eastern Parker County: Aledo ★ the Annettas ★ Hudson Oaks ★ Willow Park

Volume 9, Issue 31 <http://www.community-news.com> July 30, 1998

Water Rationing Update

City of Aledo: The City of Aledo has now restricted outdoor watering hours under its rationing plan. Houses with even-numbered addresses can water on even-numbered days, and odd-numbered addresses can water on odd numbered days between the hours of 8 and 10 a.m. and 8 and 10 p.m.

City of Willow Park: Odd/Even rationing continues, with watering allowed between the hours of 8 and 10 a.m. and 8 and 10 p.m. Hand-watering only is allowed - no sprinklers.

Both cities expressed appreciation for those who are abiding by the watering restrictions.

Water Conservation Tips: more water conservation tips can be found on page A5.

The Springtown Epigraph

Volume 35, Number 15

Thursday, July 30, 1998

50 cents

18 pages plus supplements

Springtown, Texas 76082

City opts to ration water

by Edwin Newton
The Springtown Epigraph

With Springtown's water system operating at capacity, the city council has opted for water rationing.

The council passed Ordinance 389 Monday night, giving the council and Mayor Thomas Gentry the power to regulate the water situation, now and in the future.

The council adopted a water rationing policy that allows folks with odd-numbered water bill addresses, such as 101 or 103, to water only on odd numbered days — Tuesday, Thursday and Saturday. Water customers with even numbered addresses should water only on even numbered days — Monday, Wednesday and Friday. Folks with odd numbered addresses may not water on two consecutive days, such as July 31 and Aug. 1.

The water rationing pertains only to gardening, watering yards or washing cars. Local businesses, as are also included.

Rationing officially goes into affect Friday.

Monte Taylor, public works director, said the city is currently operating within the capacity of the water treatment plant. However, he said the city's water usage has been steadily increasing. As of late, water usage has exceeded 500,000 to 525,000 gallons per day.

““

We want everyone out there to be informed. We don't want to go out there and start writing citations.

Thomas Gentry
Springtown Mayor

“The range we would like to maintain is between 350,000 and 450,000 gallons (of usage) per day,” Taylor said. “If we stay at this range, the treatment facility can be operated at its optimum efficiency.”

Taylor said the priority is to maintain enough water for drinking and fighting fires.

Taylor said the next 7 to 10 days should tell whether or not water rationing has provided the necessary relief. If it has not, outside watering could be prohibited for entire weekend periods — from noon Friday until noon Monday.

Beginning next week, Springtown police officers will be

issuing warnings for water customers who do not observe odd-even water rationing. A second offense could meet with a citation and a fine not to exceed \$2,000.

The ordinance has been published in the *Springtown Epigraph*, as well as posted at city hall. Water rationing will also be mentioned on customer utility bills.

“We want everyone out there to be informed,” mayor Gentry said. “We don't want to go out there and start writing citations.”

Cindy Hall, interim city administrator, said water rationing is part of a “pro-active” approach in preventing a larger problem. City crews have already had to repair some water leaks. Water lines are beginning to shift within the dry ground, causing some to break, she said. Since many of lines are made out of old, clay-like material, continued stress could cause more leakage.

“We don't want to wait until we get to a crisis situation,” she said.

Persons who own individual wells will not be subject to water rationing. Gentry said the city will try to keep track of who has an individual well.

The ordinance gives mayor Gentry the power to make any other watering restrictions without having to write another ordinance.

CITY FINAL

Fort Worth Star-Telegram

www.star-telegram.com

SUNDAY, AUGUST 2, 1998

Tarrant County, Texas "Where The West Begins"

Price \$1.50

Grass fire burns home, swimming pool



Star-Telegram/KATSUMIHA BOUAPHANH

A fire-damaged swimming pool lies in front of a mobile home that burned after a grass fire spread to a residential area of Weatherford yesterday. Craig Gardner, right, hoses down the

mobile home. Gardner lives next door and said he feared that the fire might spread. The owner of the mobile home had been evacuated earlier.

STORY ON PAGE 2B

Warm memories

Seniors recall life in days before air conditioning

► Fort Worth lifts restrictions on outdoor watering. Page 8A

BY KAREN ROUSE
Star-Telegram Staff Writer

Growing up on his daddy's West Texas farm and ranch, Lanham Riley often cultivated cotton and herded cattle in 100-degree temperatures under a scorching sun.

A wide-brimmed hat shaded his head. He drank water. He didn't use

a fan to cool off because he'd never seen one. And, he says, he never complained.

"I had to work," the 79-year-old rancher said. "People didn't complain in those days. They weren't like these people. They didn't have the news media following you

(More on HEAT on Page 8)

How hot is it?

A comparison of weather between this year and 1980, when the Metroplex had 69 days of 100 degrees or more.

Year	Aug. 1 temperature	Days of 100° or more*
1998	106	40
1980	104	45

Record: 106 Normal: 98
* as of Aug. 1

Current 100°-plus streak: 27 days

Source: National Weather Service

Heat

From Page 1

around taking pictures of you ... Every day you pick up the paper or turn on the television they show some poor soul out there sweating.

"These people out here today, they've got air conditioning. Now they can't get out in" the heat.

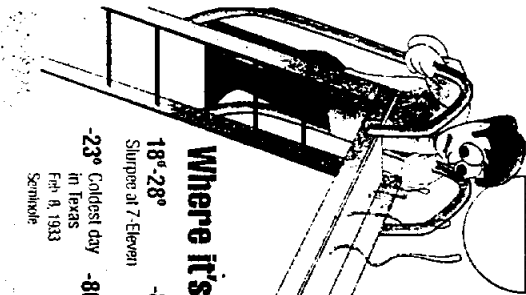
Visions of the modern-day Texan, moving like a slug across a sidewalk, breathless, flushed, complaining about the heat and humidity, seem to make older Texans — those who grew up without air conditioning — shake their heads. Whether keeping windows open to circulate the air, sleeping on the porch or soaking the bedsheets with water, they coped with the heat.

It seems, they say, that Willis Carrier's early 1900s invention — the air conditioner — has turned the modern-day Texan into a bit of a wimp when it comes to tolerating the heat.

Today in the Metroplex, 95 percent of residential customers have some form of air conditioner, TV Electric spokesman Rand LaVonn said. Of those with air conditioning in the Metroplex, 70 percent have central air, he said.

So how did they cope before A/C?

"We had some awful hot days," said 85-year-old Morris Bricker, recalling his childhood.



Where it's hot...

- 18°-28°** Coldest day in Fort Worth
Shilpree at 7-Eleven
Feb. 12, 1899
- 23°** Coldest day in Texas
Feb. 8, 1933
Seminole
- 80°** Coldest day in the United States
Jan. 23, 1971
Prospect Creek, Alaska
- 129°** Coldest day in the world
July 21, 1983
Vostok, Antarctica
- 136°** Hottest day in the world
Sept. 13, 1922
Alauzen, Libya
- 134°** Hottest day in the United States
July 10, 1913
Death Valley, Calif.
- 114°** Inside a Ford Taurus parked on Seventh Street for two hours in downtown Fort Worth
- 120°** Hottest day in Texas
Aug. 12, 1936, September
- 113°** Hottest day in Fort Worth
June 26 and 27, 1980
- 109°** Surface of Seventh Street in downtown Fort Worth
- 85°** Water in Shoiguin Falls water slide at Six Flags Hurricane Harbor in Arlington
- 78°** A quart of Key lime pie Blue Bell ice cream left out for two hours on Seventh Street in downtown Fort Worth

SOURCES: National Weather Service; National Climatic Data Center

See the page 1A FOR PHOTOS

Where it's hot, and when...

The official temperature is measured in a controlled setting at Dallas/Fort Worth Airport. But the heat-humance blast you feel when you step outside can be a lot hotter. So how hot is it, really? We took a thermometer out on a recent day when the official temperature reached a high of 102 degrees. Here's what we found.

Dr. Scott T. Stoll, a physical medicine and rehabilitation specialist and assistant professor at the University of North Texas Health Science Center at Fort Worth, said people do become acclimated to heat.

"My belief is that people's physiology changes over time. Over a period of time in hot weather, their bodies learn to retain water. . . . The body accommodates a variety of stress, whether it's heat or exercise. Usually it adapts fairly regularly, within six weeks of a challenge," he said.

Yesterday's architecture helped, too. Many older homes were better designed for the heat.

Lewis T. May, director of the Center for Urban Ecology at the Gerald Hines College of Architecture at the University of Houston, said many homes were designed with a sleeping porch.

"When it got good and hot, you dragged your bedroll outside and you slept outside. That's where you ate, you courted, you played cards — it was a community space," he said.

He added that builders also kept in mind the location of the sun. "You wouldn't want to warm the sleeping side of your house,"

Barbara Young, the 48-year-old director of the White Settlement senior center complex who grew up west of Weatherford, said that as a child, "we snuck out and slept on the roof. We'd drag the bed outside and sleep under the stars."

Young said she also remembers sleeping on top of her sheets instead of under them and taking showers before bed. "You'd leave your skin damp. . . . It would cool you down," she said.

"That's the trick I remember," Catherine Carlton, an osteopathic physician who grew up in Fort Worth in the 1920s and 1930s, said she thinks people are losing their "power of accommodation."

Carlton said she kept cool as a girl by opening windows throughout her home "to get the breeze all the way through."

Later, her family got an attic fan. "It would pull the air in the windows and we thought we were in paradise," she said. "In our living room, we had a fan that sat on the floor and there was a kind of moist cloth or material in front of it. It would blow and have some air and a little moisture."

Perhaps, some say, the temperatures now are actually higher than they used to be. Not so, according to Skip Ely, a meteorologist for the Dallas Fort Worth office of the National Weather Service.

"It is true that we are more humid more often because we've generally had more wetter years," he said, but the "indications are that we've had plenty of warm weather in the past, particularly in the" 1950s.

The years leading up to the late 1950s, when air conditioning became more popular, are among those with the highest number of 100-degree days.

Ely said that 1980 ranks No. 1 with 69 such days, but that 1954 had 52 100-degree days; 1956 had 48; 1952 had 44; and 1951 had 40. There were 34 100-degree days in 1943 and 1934, too.

"I think what it is is that people have gotten so used to air conditioning, so acclimated to it, that they feel the heat more when they do have to go in it."

Wildfire poses threat to homes

Blaze chars 1,000 acres in Weatherford area

BY GALE M. BRADFORD
Special to the Star-Telegram

WEATHERFORD — A wildfire charred more than 1,000 acres at the north edge of Weatherford yesterday, narrowly missing dozens of homes where residents grabbed garden hoses to join the firefighting.

One mobile home was destroyed, along with several barns and outbuildings, and about 150 homes were threatened in the area west of Farm Road 51 North, on Odel and Hawkins Lilly roads. About 40 homes were evacuated.

Firefighters had the blaze contained by last night, said Parker County Fire Marshal Jeff Edwards.

But residents planned to keep their guard up, Odel Road resident Greg Hull said yesterday afternoon as he maneuvered a garden hose to douse spot fires near a neighbor's home. The fire had already destroyed a nearby barn containing a tractor and other farm implements.

Hull said he refused to leave when law enforcement officials alerted about 40 residents to evacuate.

He said he and his father used garden hoses to protect his home on the north side of Odel and his mother's home on the south side of the road.

"It was coming from every direction," Hull said as he dragged about 800 feet of garden hose to douse burning wood at the back of an absent neighbor's house.

"They tried to make me leave but I wouldn't," he said looking in the direction of the charred mobile home only two home sites west of where he was standing.

Hull and firefighters did not know who lived in the burned home.

No estimates were available on damage.

Across the state, wildfires con-

tinued to be a problem. The Texas Division of Emergency Management reported Friday that 7,236 wildfires have burned 300,752 acres since May 1. Aircraft dropped more than 215,000 gallons of water and fire retardant on Texas fires Wednesday, the biggest one-day total since early May.

The Weatherford-area fire broke out about 1:15 p.m. and burned about five structures, including the home, by 5 p.m., Edwards said. He estimated that about 1,000 acres had burned. The fire's cause was undetermined last night.

Edwards said four helicopters and one tanker plane loaded with retardant worked with firefighters from at least 10 surrounding communities and five U.S. Forest Service "strike units" from South Dakota.

Temperatures over 100 degrees and humidity of about 15 percent added to the fire danger, Edwards said.

"When the humidity gets less than 20 percent, it's really critical. As the humidity drops, the fire intensity gets higher," Edwards said.

Hot and tired, Hazel Roberts sat in her parked car on Farm Road 51 North about 3 p.m. waiting to hear if her home burned. She said she was sleeping when a neighbor told her that Weatherford police, Department of Public Safety troopers and sheriff's deputies were asking residents to evacuate. She said she quickly dressed, jumped in her car and drove to the safe highway area.

She was allowed to return home about 5:30 p.m., she said. She found things in order and found her dog, Petey, safe in her yard. She was unable to load Petey in her car when she sought safety.

Hull said he didn't plan to sleep last night. Roberts said she would sleep with one eye open.

This report contains material from The Associated Press.

The Weatherford

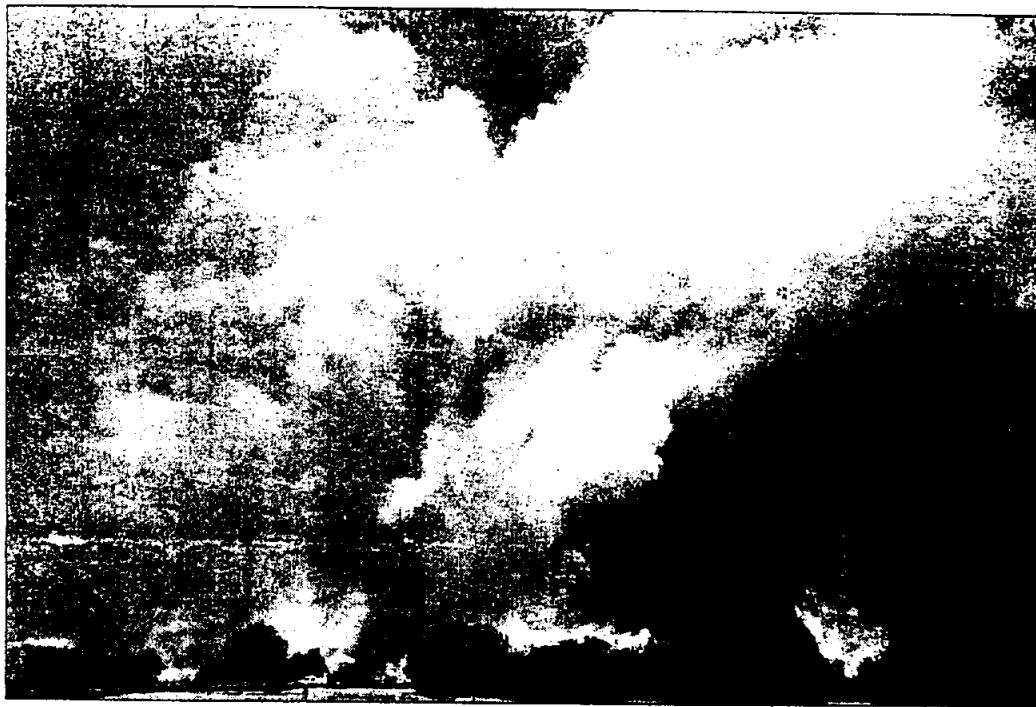
DEMOCRAT

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SUNDAY
August 2, 1998

75 cents
60 pages, 5 sections

Drought fears realized



This near-panoramic view of Saturday's fire that began at the north-central city limits of Weatherford could be seen from a great distance and brought firefighters from all over the county as well as aid from Fort Worth and U.S. Forest Service units.

Democrat photo by Brad Michael Moore

At least three structures destroyed by blaze as hot wind spreads the fire

By DANIELLE SCHULMAN
and CAROLYNE GOULD
Democrat Staff

WEATHERFORD — Shortly after 1 p.m. yesterday, a small fire around Weatherford's North Main water tank mushroomed into a huge blaze that spread through an estimated 100 to 200 acres of Weatherford's northern-most neighborhoods. Firefighters from Fort Worth, Air National Guard and the U.S. Forest Service were called in to battle the flames. Small whirlwinds created by the fire's

own heat dashed across the tinder-dry grass. At least one mobile home, a barn and a child's tree house were destroyed. One firefighter said trees were bursting into flames like Johnson grass.

Highway 51 north, Zion Hill, Hawkins-Lilly Road and Odell could all claim an epicenter of the blaze before the fire was reduced to glowing embers threatening to reburn into flame.

Area residents manned water hoses and people who owned bulldozers and backhoes joined the

firefighting efforts. Volunteers, apparently remembering the devastation caused by the Poolville fires just two years ago, showed up to help.

A mobile communications unit was set up at Odell Street and Hawkins-Lilly Road to orchestrate the fire-fighting effort. At 1:48, air support and additional trucks were called in. Three minutes later, a fire truck was called to the 1900 block of North Main where the wall of fire was pushing toward

See Fire, page 2A



First responders to the fire that began only a few hundred yards away see trees flames spread out before them as they try to stop the fire's ground spread.

Photo Courtesy of Ray Eason



Weatherford firemen from Station 1 move quickly to put down hot spots west of Highway 51. The fire soon took a northwestern move towards Zion Hill.

Democrat photo by Brad Michael Moore

Fire

Continued from page 1A

two homes. The cities of Weatherford and Springtown sent brush and water trucks to the scene.

With the dry, windy weather conditions, embers from the main fire started smaller fires. Where fires had already been extinguished, some ignited again. At 1:57, the Fort Worth Fire Department had been called in. A mobile home was engulfed in flames with "smoke so thick you can't see," said one firefighter on the scene.

At 2:02 Precinct 2 brought in water tanks to aid the firefighters. Reports said the needed helicopters were still "20 minutes out." Fire engines from Argyle arrived to see a sky covered with billowing clouds of smoke.

The distraught cry of "We lost another house" was heard floating across the smoke-filled air. At 2:08, power lines were down and electricians were called in.

By 2:20 p.m., every fire and police authority in the county was on hand to deal with the unpredictability of the event. The air

tankers had arrived — two minutes ahead of schedule.

The intersection of Hawkins-Lilly Road and North Main was the main entrance for vehicles needing to get to the fire's epicenter. By 2:25, authorities were evacuating residents living in areas they considered danger zones and potential danger zones. The Weatherford Police Department didn't allow any resident to return to their homes from the Hawkins-Lilly/North Main barricade.

The epicenter worked its way north and jumped Hawkins-Lilly at 2:26.

At 2:30, with the fire heading northwest to Odell Court, the Weatherford Police Department set up another barricade at Peaster Highway and Zion Hill Road so water tankers and other authorities would have better access to the fire which seemed to have headed further west. Police officers directed traffic off Zion Hill Road at that intersection until about 4 p.m.

While directing traffic at that intersection, police officers pulled their guns on two people that drove

through their physical barricade. The police officers had first given the drivers verbal warnings. The swift action by the police officers finally got the attention of the drivers who realized the officers were serious about the blockade.

Several drivers, including a distraught mother trying to return to her home and two children, pleaded with officers to allow them access to their homes off of the Zion Hill area, but the officers reminded them of the danger and told them they couldn't allow them access.

At 2:28, the fire jumped Jones Road. People were being evacuated from Odell Road, south of the fire. Jordan Construction brought in bulldozers to help. A man with a truck full of ice offered to help.

Between 2:30 and 3:30, water was being picked up at Cartwright Park Lake and was being dropped on the fire from the air. The Silver Creek fire unit was out of water and went to refill.

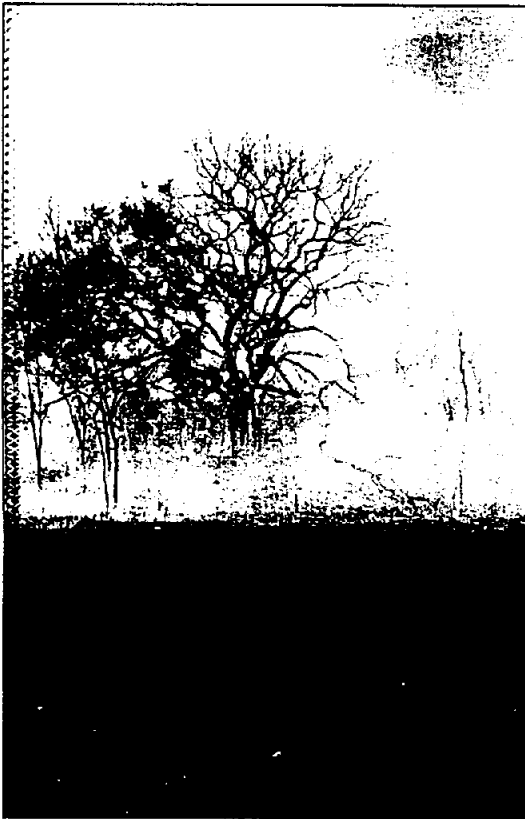
At 3:51, reports indicated the fire had stopped spreading. Firefighting efforts continued, including using

equipment to construct firebreaks up to 60 feet wide to help keep the fire contained. Authorities expected to be on the scene all night Saturday, fearing drought conditions could ignite a fire on the same scale today.

One member of a special patrol unit said he thought the fire was left over from one that they had extinguished at midnight on Friday. (Apparently, a stolen vehicle had been set on fire near the water tank.)

According to Weatherford resident Donna Martin, yesterday's fire started in the back yard of a residence on North Main. From there, the fire spread north through the backyards of homes lining the west side of North Main. The exact cause of the blaze and full extent of the damage had not been determined as of press time.

Editor's note: Chantele Penny, Rowdy Penny, and Thomas Andrew Gould contributed to this report.



Democrat Photo By Brad Michael Moore

Smoke rises from the ground just west of the transformer station north of Weatherford on Highway 51.



Democrat Photo By Brad Michael Moore

This is what a hot spot looks like. It will engulf a 30 foot tree within seconds.

WP defines police duties Council also addresses fire sprinkler plan; water pumping, storage

By Roger M. Elliott

Democrat Reporter

PARKER COUNTY — Thursday night the Willow Park city council met in a special session to complete their July agenda.

All officials of the date were present except the city attorney.

The meeting was called to order at 7 p.m.

Automatic Fire Extinguishing (sprinkler) Systems

The first action was combining a piece of old business by Councilman Doral Risch with a piece of new business by Councilman Jim Davis and then proceeding on the joint item.

Both items concerned the ordinance governing automatic fire sprinkler systems.

The council discussed the 10 points below and then unanimously directed the city attorney to draft an ordinance covering them all and report back to the council.

By Councilman Risch:

1. Whether control of this ordinance should be moved from the Uniform Building Code to the National Fire Prevention Association 13.
3. A minimum tap size requirement.
4. Registered engineer stamping requirement on all sprinkler plans submitted.
5. Inspection of all phases of installation. Inspections recorded with the building inspector.
6. Requirement for sprinkler systems to have an outside stand-pipe and be on the front or street

side of the building.

7. Requiring all systems be externally monitored at all times.

9. Requiring compliance for all new buildings and for buildings whose renovation and construction cost equals half of the original valuation.

10. Comparison of WP draft ordinance to ordinances of other areas.

By Councilman Davis:

8. In areas not on city water, requiring a dry system and connection to city water within 30 days of availability.

2. Determining who pays the tap fee and meter purchase if meters are utilized, and monthly charges.

Davis said that when a business has a daily water need that is met by a 3/4 inch pipe, but they have a four inch pipe installed to feed a fire sprinkler in the potential eventuality of a fire, they should not have to pay the monthly use fee associated with the larger pipe since they are not using the system regularly.

This last item caused the most discussion. Another generally noted concern was with water being siphoned off of the emergency sprinkler system feed and being used as a day-to-day supply without flowing through a meter. Council members said there are a few problems with stealing water from the city.

In addition to the city's loss of revenue from pumping and processing water that is being leached off, daily wear and tear is being put on systems that need to be in peak working condition in the event of a fire.

The consensus recommendation of the council was to install meters on the sprinkler system lines to monitor flow.

Items to revisit at future meetings

Mayor Pro Tempore Gene Martin reminded the council to get recommendations and suggestions to him relating to Chapters 1, 2, and 4 of the Code of Ordinances. This is part of Martin's cover-to-cover inventory and critical evaluation of the Code Book.

The council opted to review the ordinance governing fireworks at their next meeting.

A motion by Councilman Risch to appropriate \$5,000 for immediate drainage work along Ranch House Road failed by a vote of 1-4. The dissenting voters said that at that dollar figure, a disproportionate amount would be spent on getting the equipment on site and set up, leaving too few dollars spent on the actual project itself.

Mayor Les Cooley said that a larger project with the same equipment overhead cost would leave a larger percentage of the appropriated funds to fix irrigation. City Administrator C. Guy Nalae says he does have a list of particularly problematic drainage areas from reports by citizens, police patrols, and his personal survey which could be prioritized for such a project.

The council then passed a motion 5-0 to get an estimate for the work required to efficiently remedy drainage problems and have that information presented at the regular August meeting.

The council discussed a measure by Councilman Sam Bertling to review speed limits and ascertain how speed limits are determined by the state and other governing bodies. No action was taken.

Bertling also asked about the status of previously ordered "Dangerous Curve" and (yellow) recommended speed limit signs. A member of city staff said the signs are on order — some signs arrived Thursday but had not been inventoried.

Police Patrolling Procedures

Bertling asked Police Chief Ray Jones, "What takes our police to the interstate?"

Jones answered that Willow Park Police are routinely on I-20 as part of a regular circulation to the Willow Springs Oaks area south of the highway.

Jones said that most of the time Willow Park officers patrol by their own discretion unless they are dispatched by him, the lieutenant, or the county.

Through questions by the council, it developed that on holidays such as New Years Eve, Chief Jones may actually dispatch a cruiser to park at and work I-20. According to Jones, this is not a typical practice and it is never done at the expense of patrolling the neighborhoods of Willow Park.

Bertling specified that if a police patrol is on I-20 three or four times during a normal shift, and this is part of a circulation pattern, he would expect that most houses in the city could expect to see an off-

cer drive by the same number of times.

Martin said, "I would rather have our officers patrolling the city, providing security to the neighborhoods than working the interstate."

Councilman Gerald Liepert noted that residents of Willow Park also use the interstate on a daily basis, but agreed that he too would emphasize internal security, patrolling over interstate ticketing.

Jones assured council members that Willow Park patrols I-20 as a street in the city's jurisdiction and in transit to other areas of the city but emphasized that the Willow Park Police Department does not make a practice of "mining" the interstate.

WP, HO, Aledo, Parker, PCUD No. 1 meet to address water supply

By ROGER M. ELLIOTT

Democrat Reporter

SOUTHEASTERN PARKER COUNTY — In the 1950s, and to a lesser extent in 1996, many wells, particularly those drilled to the Paluxy formation, dried up causing affected residents and businesses in this area considerable hardship.

The City Councils of Willow Park, Hudson Oaks, and Aledo as well as representatives from Parker County and Parker County Utility District Number 1 (PCUD No. 1) will meet Tuesday at 7 p.m. at the Willow Park city hall, 101 Stage Coach Trail regarding three possible long-term solutions for their water supply concerns.

Officials encourage concerned citizens to attend this preliminary report of findings and recommendations and to participate in the public hearing which will immediately follow. The presentation and recommendations will be issued by the engineering consulting firm of Teague Nall and Perkins.

The three municipalities paid a joint fee of \$26,500 which was matched with another \$26,500 by the Texas Water Development

Board to conduct a study designed to find the best means to ensure an adequate water supply for the area through the year 2028.

The expected recommendations include increasing reliance on surface water rather than ground water and/or entering into an alliance with a neighboring city that is already treating water.

One of the possible recommendations includes piggy-backing on Weatherford's efforts to draw water from the Benbrook Reservoir. According to Willow Park City Council member Jim Davis, this is not inherently a problem, but it could become one if this program is delayed.

If Weatherford were to act alone and lay a 26-inch transmission line (pipe), when Weatherford plus Parker County and the other towns would need a combined 60 inches, there could be a problem, Davis said.

It is hoped, however, that if everyone concerned sits at the table from day one, those types of issues can be discovered and successfully overcome.

Monday, August 3, 1998

Metro

www.star-telegram.com

Fire spares homes, church



Special to the Star-Telegram/SPENCER D. COOK

A 3-alarm fire sweeps across about 50 acres of dry pasture near Spur 580 and Loop 820 in west Fort Worth about 3 p.m. yesterday. Approximately 30 fire units had contained it by 5 p.m. and firefighters were positioned to protect property if the smoldering

grass flared up, Fort Worth Fire Capt. J.R. Sowder said. Three homes, a church and a wedding chapel escaped the fire although a couple of vacant outbuildings were damaged. There were no injuries.

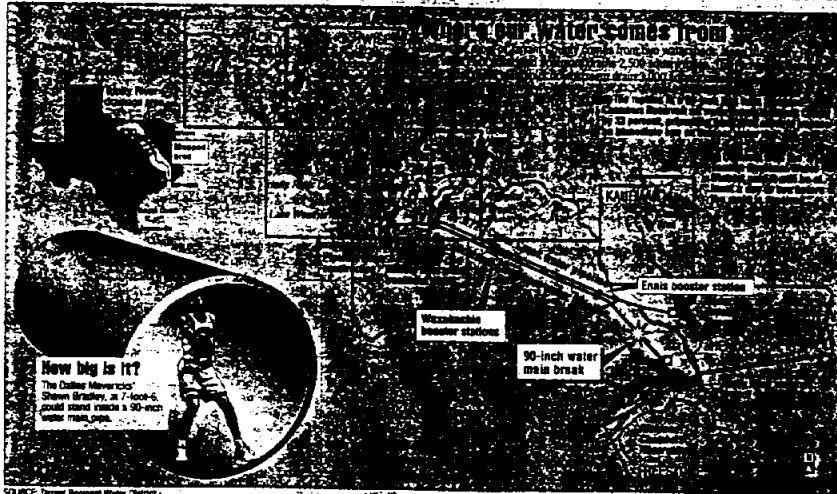
Fort Worth Star-Telegram

MONDAY, AUGUST 3, 1998

Tarrant County, Texas • "Where The West Begins"

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Pipeline blowout cuts water



SOURCE: Tarrant Regional Water District

Supply to Tarrant drops 33%

By GINGER D. RICHARDSON AND BRIAN D. CRECENTE
Star-Telegram Staff Writers

Area water woes worsened yesterday after a 90-inch line feeding the precious liquid from a Navarro County reservoir to Fort Worth and its surrounding cities ruptured, slashing the water supply to Tarrant County by about 33 percent and prompting widespread outdoor watering bans.

The ruptured main carries water from the Richland-Chambers Reservoir to Fort Worth's Rolling Hills Treatment Plant, the cities of Arlington and Mansfield, as well as the Trinity River Authority, said Mike Williams, community relations manager for the Tarrant Regional Water District.

"It's huge," Williams said of

the break, which occurred about 90 miles southeast of Fort Worth. "You could literally drive a jeep through that line, that's how big it is." (More on WATER on Page 9)

Water

From Page 1

"We are greatly reduced in the amount of water that we can deliver to our customers," he said.

The 1 p.m. rupture sent at least a million gallons of water spewing into the air and cut the area's Central Texas water source by 52 percent, Williams said. However, no one went without water, because officials were supplying water through a neighboring pipeline, he said.

Water is also supplied to Tarrant County via Lake Bridgeport, Lake Worth and Eagle Mountain Lake.

After the rupture, Fort Worth, Arlington, Mansfield and several of the Mid-Cities imposed immediate bans on all outdoor water use through at least midnight Wednesday. About two dozen other entities and municipalities that buy water from Fort Worth must also abide by the water ban.

Mary Gugliuzza, a spokeswoman for Fort Worth, said she spent much of yesterday afternoon notifying people about the ban.

"The Tarrant Regional Water District called for its customers to issue this ban, and we are complying with that," she said.

Arlington, too, told its residents to stop all outdoor watering and declared a water emergency.

Arlington gets about 25 percent of its water from the 90-inch line and the remainder from Lake Arlington, which is also supplemented by the same 90-inch line, said Charles Anderson, Arlington's water utilities director. The lake's only other source of water is runoff.

"This is serious, let's start by saying that," Anderson said. "It significantly reduces the amount of water we can take for our treatment plant."

Grand Prairie, which had already instituted an outdoor watering ban this weekend, receives about 1 million gallons out of the approximately 30 million gallons from Fort Worth. The rest comes from Dallas and wells.

Ron McCuller, Grand Prairie's water utilities director, said Fort Worth officials told them last night that they would continue to receive the 1 million gallons.

"This year, any cutbacks will hurt us," he said. "We are about ready to handle tomorrow and we are going to see if we can ride this out until Wednesday."

Mansfield has also issued water rations, and five Northeast Tarrant County cities that contract with the Trinity River Authority will be affected by the broken waterline as well, said Warren Brewer, northern regional manager.

Under the Tarrant County Water Project, the Trinity River Authority delivers water to Euless, Bedford, Colleyville, the eastern part of North Richland Hills and the southern part of Grapevine, Brewer said.

The Trinity River Authority delivers a combined 60 million gallons of water per day to the five cities, and the ban will knock that figure in half, he said.

"If we impose more severe bans, it could even drop to a figure that's even less than 30 million gallons per day," Brewer said.

The ruptured main was one of two pipelines the Tarrant Regional Water District uses to ship untreated water to Fort Worth and other area cities from its dual reservoirs in Central Texas.

The other line, a 72-inch pipe that transports water from Cedar Creek Lake, just east of Corsicana, was intact and working yesterday, Williams said.

"It's a pretty complex system," Williams said. "But these pipes run alongside each other from Ennis into Fort Worth, so there are valve combinations that they can shut off and turn to divert that water into the other pipe."

Williams said it is going to be at least 18 to 36 hours before the ruptured line can be repaired, adding that crews would be working throughout the night to replace the main.

The 90-inch line and the 72-inch line, which were built in 1989 and 1973, respectively, run parallel, about 3 to 6 feet below the ground, from Ennis into Fort Worth.

Although it was too early to know for sure what caused the main to break, Williams said that it was probably a combination of the heat and drought, as well as increased water demand.

Replacement parts for the broken main were in storage at Gifford-Hill & Company in Grand Prairie, Williams said the water district had been in contact with the company's officials and that sections of pipe were on the way to the site last night.

In the meantime, Gugliuzza said Fort Worth will cut off water and fine residents and businesses who fail to comply with the outdoor watering ban. Fines could be as much as \$1,000, she said.

The city just lifted its odd-even outdoor watering restrictions yesterday. The limits were imposed after a 36-inch water main feeding from the city's North Holly Treatment Plant ruptured twice within three days.

The 90-inch main's rupture has affected operations at Fort Worth's Rolling Hills Treatment Plant. However, it was also expected to put increased pressure on the city's remaining purifying facilities — including North Holly.

"There's no doubt that there's going to be more pressure on our other plants," Gugliuzza said. "We're hoping for the best."

Yesterday's break, was not expected to cause a significant drop in levels at any area lakes, except Lake Arlington, where water levels are already low.

"Lake Arlington will probably begin falling very rapidly," Williams said. "We had been trying to put water into there, but now the priority is not the lake, it's keeping our customers supplied with water. We need to get some rain."

Lake Arlington is already about 3 to 5 feet below level, but the rupture's effect should not be significant if the line is repaired in the next two to three days, Anderson said.

"I think the line being out of service temporarily is not going to make a big change in Lake Arlington," he said. "But if something were to happen to extend the absence of that water, that would cause the lake level to drop even faster."

The lake's level is of particular concern because TU Electric uses the basin in its generating plants. If the lake continues to dry up, the company may have problems supplying electricity to its customers.

"Certainly those plants use water for the steam generated power, and that is a critical part of the whole electricity producing equation," said Sandy Smith, a TU Electric spokeswoman. "We know the lake level is dropping, and we have been meeting to talk about the situation."

"We don't know if or how this break will affect things," Smith said.

This is not the first time the 90-inch main has ruptured. In October 1996, both the lines broke, completely cutting off the area's only links to the two Central Texas reservoirs.

The heat will continue for at least several more days, and even a slight cool front forming in the Northern Plains brings little chance for a break from the 100-degree temperatures, said Joe Harris, a National Weather Service meteorologist. Yesterday's high at Dallas/Fort Worth Airport was 107.

Ginger D. Richardson, (817) 398-7616
© Charley Gonzalez, Elizabeth Campbell and Robert Quisenberry contributed to this report.

The Weatherford

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Burn ban continues Saturday fire may be result of arson

By DANIELLE SCHULMAN
Democrat Reporter

WEATHERFORD — An apparent arson, committed shortly before midnight on Friday, might have triggered Saturday's fires, according to Weatherford Fire Marshal Kurt Harris.

"We're eager to find out," Harris said as he noted that police officers were at his station to discuss the possible cause of Saturday's tragedy.

The blaze burned an estimated 300 to 700 acres of land, a home, a barn and a child's treehouse. Reports on the amount of acreage varied. For over four hours, people were kept from their homes and told that they couldn't gain access because of the unpredictability of the conditions.

After assisting a friend with a spot fire that broke from the main fire on Saturday, one woman said that the blaze started in back of a North Main Street residence, down the road to the south of where she was standing.

According to Harris, a truck

stolen from a Hobson's Air-Conditioning employee was set on fire at the end of Franklin street on Friday night. (Franklin Street runs north and south and is located two streets west of North Main.)

According to police reports, the truck was set on fire at the 1600 block of Franklin street.

"For four hours we attempted to put it out," Harris said.

To ensure that the truck fire had been fully extinguished, firefighters turned off the headlights of their trucks in the darkness to see if they could detect any glowing embers, but couldn't see any, Harris said.

Weatherford Police Chief Jerry Blaisdell today said that it is believed that a hot spot might have reignited from the apparent arson.

"We had a vehicle that was stolen the night before the (Saturday) fire in that same general area," Blaisdell said. There are some leads in the apparent arson case, he said.

While Harris and others attempt to determine the cause of Satur-

day's fire, Harris is also talking about the teamwork he witnessed.

"It was just so beautiful to watch," Harris said. "It was very well coordinated and orchestrated. We had so many food and drink donations."

Harris said some guys spent 24 hours out there. Some of them came back to the station for four to five hours to rest and then went back into fire-fighting mode again.

"I've got some tired guys," Harris said.

The Weatherford Fire Department has been patrolling the fire-riddled area for possible outbreaks. Three trucks patrolled for fire breaks on Sunday, he said. The department will also be on high alert the rest of this week.

"We are at about as critical a fire stage as probably we've ever been in," County Fire Marshal Jeff Edwards said today, adding that the county will keep an eye on the situation for several days.

An extension of the burn ban will

See Fire, page 2

Fire

Continued from page 1

be approved today by County Commissioners, Edwards said.

Today Edwards and Harris also expressed their thanks to the following organizations that helped fight Saturday's fires:

Cool-Gamer, Peaster, Poolville, Central, Adell-Whitt, Greenwood, Hudson Oaks, Silver Creek, Tin Top, Springtown, the Fort Worth Fire Department and strike teams of the U.S. Forestry Service.

Fort Worth Star-Telegram

www.star-telegram.com

TUESDAY, AUGUST 4, 1998

Tarrant County, Texas ★ "Where The West Begins"

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That strange stuff falling from the sky was called 'rain'

BY GINGER D. RICHARDSON
Star-Telegram Staff Writer

FORT WORTH — A few folks in Tarrant and Denton counties looked up yesterday afternoon and saw something strange falling from the sky — rain.

For most people, though, it was business as usual: hot and dry for the 29th consecutive day.

"Anybody who got more than 10 drops of rain should consider it a bonus," said Skip Ely, a National Weather Service meteorologist.

The brief summer storm blew in on winds that gusted up to 50 mph in Richland Hills where a power line was knocked down, leaving at least three city streets temporarily without electricity. The outage occurred just after 5:30 p.m. after a line fell on Oak Park Drive, police said.

Bona fide thunderstorms rocked other parts of the state. One of the hardest hit was Wichita Falls, which was on the edge of a front that moved south from Oklahoma, the weather service said.

As the skies darkened and the winds increased, the Cowboys cut afternoon practice short by about 35 minutes. Players ran for the locker rooms and fans ran to their cars as thunder boomed. About a half-inch of rain and some hail fell, the weather service reported.

Yesterday's official temperature was 105 at Dallas/Fort Worth Airport, tying the record set in 1943. The heat index was 114 degrees at about 4 p.m. in Denton and at Dallas Love Field, said Krista Villarreal, a weather service meteorologist.

Sunday's high temperature of

107 broke the record of 104, which was set in 1980.

The state's death toll — 102 as of yesterday — continued to climb in the unforgiving heat. The most recent victims were Charity Bailey, 67, of Dallas; Elvira Anaya, 65, of El Paso; Rosie Ellis, 90, of Houston; and John Rouswell, 83, of Valley View, a small town in Cooke County.

Yesterday, off-duty Fort Worth firefighters who were campaigning for a City Council candidate happened upon an elderly woman slumped over on her porch in the 500 block of Watson Street.

"She was dehydrated and disoriented," said Tate. The woman was taken to a local hospital where she was reported in stable condition last night.

The heat has fueled more than 7,400 grass fires statewide, contributed to numerous water main breaks in Fort Worth and surrounding cities, and caused an anticipated \$1.5 billion in losses for Texas ranchers and farmers.

If we don't blink, we might feel a bit of relief this week, according to the weather service. A weak front has settled over North Texas that could produce some showers, Ely said. However, any rain is going to be sporadic and fast-moving, he said.

"It is possible that some places could get a little soaking," Ely said.

Forecasters predict a high of 104 degrees today, with a 20 percent chance of rain. Highs of 102 or 103 are forecast for tomorrow, with a 30 percent chance of rain.

Dave Nelson contributed to this report.
Ginger D. Richardson, (817) 390-7616

Fort Worth Star-Telegram

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TUESDAY, AUGUST 4, 1998

Tarrant County, Texas • Where The West Begins™

SECTION 1

Cities' watering ban continues through tomorrow

Crucial pipeline repaired



Tarrant Regional Water District crews work yesterday to fix the ruptured line.



Special to the Star-Telegram/Tina Prosser

TI/ Electric officials say the company's Handley plant pumps cannot operate if Lake Arlington's level drops 5 more feet.

How hot is it?

A comparison of weather between this year and 1990, when the Metroplex had 69 days of 100 degrees or more, including 42 consecutive days from June 23 to Aug. 3.

TODAY'S FORECAST	Aug 3	Days of 100° or more
Change of scattered afternoon thunderstorms	1998 105	42
Wind southeast at 5 to 15 mph	1990 102	47
High 104, Low 86	Record: 105	Normal: 98
Report, Page 6A	Current 100° heat streak: 29 days	

O FW is the official reporting station for Metroplex temperatures. ** as of Aug. 3

By ANITA BAKER
Star-Telegram Staff Writer

After more than a day of disruption, water flowed again yesterday through a crucial 90-inch pipeline that supplies a third of Tarrant County's water.

The successful repair, however, does not mean that residents are free to water their lawns and gardens.

An outside watering ban continues through midnight Wednesday. Water officials from around the county plan to discuss ways to

Tarrant officials to discuss strategy

into re-establishing use during a meeting today.

Many cities affected by the pipeline break need to replenish their supplies before anyone feels safe in eliminating the ban, said David Marshall, engineering services manager for the Tarrant Regional Water District.

"We want to ensure health and

safety and fire protection first," Marshall said.

At 1:02 p.m. Sunday, a 20-foot section of pipeline, weakened by corrosion and stressed from drought, ruptured. The break cut the flow of water by more than half from the water district's two east central Texas lakes. The break occurred about a mile from Charfield in Navarro County.

The water break — affecting

(More on WATER on Page 9)

Full report on water, Page 9A.

CITY FINAL

IN CLASS ACTS: *Tips to improve your shopping smarts* BEHIND CLASSIFIED

Fort Worth Star-Telegram

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TUESDAY, AUGUST 4, 1998

Tarrant County, Texas ★ "Where The West Begins"

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Water

From Page 1

virtually all of Tarrant County — involved a line that transports about 138 million gallons of water a day from Richland-Chambers Reservoir near Corsicana to Lake Arlington, Mansfield and Fort Worth's Rolling Hills water treatment plant. The Trinity River Authority, which supplies water for much of Northeast Tarrant County, is also affected.

An additional 127 million gallons a day from Cedar Creek Reservoir and 140 million a day from lakes on the West Fork of the Trinity River continued to flow into Tarrant County, officials said.

Repairs on the 90-inch line were completed shortly before noon yesterday. Water was flowing by dark, and the pressure was slowly being re-established.

Tarrant Regional Water District spokesman Mike Williams said yesterday that the pipeline crisis may be over, "but the danger certainly has not passed."

A major break could happen again at another point in the pipelines, he said.

In addition to forcing a ban on outside watering in Tarrant County, the water line break put at risk operations of TU Electric's Handley plant on the shores of Lake Arlington. Without adequate

water levels in the lake, the plant, which provides 6 percent of the company's electricity, would be forced to shut down.

The lake is down more than 13 feet to 536 feet above sea level. If it drops 5 feet more, pumps cannot operate, TU officials said.

Water from Lake Arlington "is a critical part of our generation," said TU spokeswoman Carol Peters.

Should dropping water levels force the plant to stop operations, TU will first purchase additional power from other suppliers, Peters said. The company could ask customers with special industrial contracts to cut back on their electrical use or shut down. General customers would be the last to be affected, Peters said.

Fort Worth Mayor Kenneth Barr said yesterday that the city has been the beneficiary of farsighted water planning. But he said he wants city leaders to become more informed about how the water system works.

"In the five years I have been on the City Council, there has been no concern or discussion about it," Barr said. "I want to make sure the level of confidence we have is backed up by the facts."

Water officials said yesterday that the break and ongoing drought have led to false rumors that Tarrant County residents might need to boil water because of possible contamination.

People are confusing the pipeline break with water prob-

NEED HELP?

- United Way of Metropolitan Tarrant County, 258-8100
- Tarrant County Department of Human Services, 531-5620

lems in Wylie in Collin County, where residents have been warned to boil water, said Mary Gugliuzza, a spokeswoman for the Fort Worth water department.

Several area cities are experiencing problems in addition to those caused by the pipeline break.

Sansom Park, which faced power failures at a main pump station Saturday night, has extended an outdoor watering ban until further notice for its residents. River Oaks will institute an odd-even rationing plan, even after Tarrant County's restrictions are over.

In Southlake, electrical problems caused two of the city's three water pumps to stop working Sunday, officials said. The pumps were fixed by 10 p.m. Sunday, but not before water levels in the city's storage tank on Pearson Lane fell to a critical 8 feet.

In Dallas, City Manager John Ware instituted a water watch Friday that asks residents to voluntarily conserve.

Dallas supplies water to 21 cities and 1.9 million people. But Dallas officials said they expect no major water line problems such as those in Fort Worth. Dallas has pipelines from five reservoirs, but only one line is a high-pressure line, officials said.

This weekend, before the break, the Tarrant Regional Water District was forced to crank up its more costly high-pressure pumps to meet county residents' growing demand.

"We have had it throttled to the floor the whole time," Marshall said. "It finally gave up."

The pipeline was laid in 1989, but in the mid-1990s the district attached strips of zinc to the pipes to slow corrosion. "It stopped the damage, but it was weakened already," he said.

The district has routinely checked the 150 miles of pipe to the lakes in winter when demand is low and portions can be shut down temporarily. The segment that broke was to have been inspected this winter.

Last winter, the district installed 45 new segments of pipe and repaired two other locations, he said.

"We have inspected probably three-quarters of the pipeline in the last five years," Marshall said.

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Matthew Brady, Elizabeth Campbell, Tara Dowley, Dave Nelson, Mede Nix, Jennifer Schultz and Bill Teeter contributed to this report.

General compliance marks watering ban

By Paul Bourgeois
AND LAURIE MAYK

Star-Telegram Staff Writers

The green, green grass of home may not stay that way long.

Most Tarrant County residents seemed to be going along yesterday with a ban on outdoor watering that was ordered Sunday after the rupture of a 90-inch main that serves the area.

Random midday checks of Fort Worth neighborhoods and area cities served by the Tarrant Regional Water District found few who hadn't heard about the ban or weren't complying, even with temperatures well over 100. In Fort Worth yesterday, no citations were issued.

But in Arlington, at least one resident was determined to keep his lawn green, ban or no ban.

"If I stop watering, my whole yard will look like that," said

Johnny Holmes, pointing to an area of dead grass in his east Arlington yard. "I've put \$40,000 worth of grass, trees and shrubs in my yard."

Holmes said he has not heard anything official about the ban and will continue to water his yard until he hears otherwise.

Most cities in Northeast Tarrant County were sending out crews to tell violators to quit watering, and some are prepared to hand out citations or cut off water to violators.

In Colleyville, city officials displayed portable signs announcing the ban on Texas 36, and employees are informing residents and business owners of the restrictions.

"If they don't comply, we will cut their water off at their meter," City Manager Bob Stripling said. "We haven't had to do that yet,

and we hope we don't."

In Keller, water ban violators are subject to a fine of up to \$500.

"Our staff is out in the field talking to people as well as citing people," said Phyllis Sowell, assistant to the Keller city manager. "A lot of people are under the impression that the ban only means no lawn watering, and that's not the case. It's for all outdoor watering."

Fort Worth Water Department spokeswoman Mary Gugliuzza said no one has been dispatched onto the streets solely to police violators, but meter attendants and other Water Department employees are stopping to alert any residents they see watering.

"Right now, we're just trying to make people aware of it," Gugliuzza said.

Employees are distributing fliers explaining the ban at houses or businesses that are in violation.

The ban is expected to remain in effect until midnight tomorrow.

The department is compiling a list of violators who could receive citations after the ban is lifted, Gugliuzza said. Repeat offenders will be particularly targeted, but even one-timers could be fined, she said.

The Texas Rangers baseball team felt the pinch yesterday, and for a short time club officials were concerned that the watering ban would affect tonight's game against Toronto at The Ballpark in Arlington.

Tom Burns, groundskeeper for The Ballpark, said the dirt portion of the infield is watered every day.

The Rangers, along with Six Flags Over Texas, Six Flags Hurricane Harbor and all other businesses that rely on water, such as carwashes and plant nurseries, do not fall under the restrictions.

"We've told the Rangers they can water the infield because it's part of them conducting business," said Charles Anderson, director of utilities for Arlington. "We've also asked them to do everything they can to be wise about internal water use."

Some area golf courses that use city water are having to deal with browning greens.

George Krutzick, manager of golf operations for the city of Fort Worth, said the Rockwood and Pecan Valley courses get their water directly from the Trinity River. But watering was halted at the Meadowbrook, Sycamore Creek and ZBoz golf courses because they use city water, he said.

River Crest Country Club course superintendent Doug Fisher said club officials received calls yesterday morning when neighbors saw sprinklers in operation.

Although the club uses Trinity River water, it will halt irrigation during the day as a gesture to neighbors who cannot water their lawns, he said.

Temperatures have reduced the number of golfers on the courses and the wear on the greens, Krutzick said.

Roy Wilson, supervisor of Fort Worth's seven municipal swimming pools, said all will be open today.

Most of the water at the pools is recirculated. He said the city normally adds a small percentage daily to account for evaporation.

Wilson said the water might be a little lower than normal.

Matthew Brady, Tara Donley, Tawnell Hobbs, Dave Nelson and Jennifer Schultz contributed to this report.

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CITY FINAL

Fort Worth Star-Telegram

www.star-telegram.com

THURSDAY, AUGUST 6, 1998

Tarrant County, Texas * "Where The West Begins"

50 CENTS

Water from fixed pipe reaches lake

By ANITA BAKER
Star-Telegram Staff Writer

Water flowed throughout a repaired 90-inch pipeline yesterday for the first time in three days, pouring into a shrinking Lake Arlington and most water systems in Tarrant County.

"We are up and running and starting to put a little water in Lake Arlington," David Marshall, engineering services manager for the Tarrant Regional Water District, said shortly before noon.

A single pump began operating about 11 a.m., even though the water district never found suspected leaks that appeared on monitors after the broken line was repaired Monday. The line from Richland-Chambers Reservoir in Navarro County provides about one-third of Tarrant County's water.

The successful start-up, however, does not mean that people can soak their lawns. At midnight last night, a ban on outdoor watering was eased to allow residents to water only with hand-held hoses.

Marshall said water district officials will be talking to its major customers — including Fort Worth, Arlington, Mansfield and the Trinity River Authority — to decide whether the district or individual cities will set restrictions as needed in the future.

"But we need to let everybody know we don't want them to go back to watering as hard as they were before," he said.

"We need folks to be responsible and helpful in the next couple of weeks

(More on WATER on Page 3)

INSIDE

> Hundreds line up to seek help with electric bills; applications to be taken in Fort Worth again today. Page 12A

> Lake Arlington's drop spurs memories; look at remedies. Page 12A

> The great drought of the 1950s ended with a deluge; Bill Fairley writes. Page 12

> To further ease the drought, try this modern rain dance. LIFE & ARTS, Page 12



Water

From Page 1

because we still need to recover from this disaster."

The Arlington City Council will meet in emergency session tomorrow to discuss the water situation.

Lake Arlington has been hit hard by the water crisis. The district uses the lake for storage to serve Arlington and the Trinity River Authority, which supplies

much of Northeast Tarrant County.

And TU Electric depends on the lake's water to cool its Handley generating plant. The water had dropped to within 5 feet of the minimum that the plant needs for operation, TU officials said.

Water to the lake was shut off during several water-pipe breaks in Fort Worth last month and was stopped again when the Richland-Chambers pipe ruptured Sunday.

Enough water from a 72-inch water district pipeline from Cedar Creek Reservoir in Henderson

County was diverted to the lake by Tuesday to slow the daily 3- to 4-inch drop in lake level to less than an inch.

Response to the watering ban also helped water levels, Marshall said. People responded so well that the water district was supplying more water than was demanded yesterday, Marshall said.

The last time the water district restricted water use was during the 1950s drought, he said.

Most cities in Northeast Tarrant County are relying on the water

officials of some cities, including Southlake and Keller, say they plan to bring back city restrictions when the district plan is lifted.

By today, Marshall said, he expected as many as 140 million gallons per day to be flowing into Lake Arlington from the Richland-Chambers and Cedar Creek reservoirs. Before the breaks, the district was pumping about 30 million gallons a day into the lake.

The district's average daily water supply comes from three main sources — about 127 mil-

lion gallons from Cedar Creek Reservoir, 138 million from Richland-Chambers and 140 million from lakes on the West Fork of the Trinity River.

District officials were still searching for leaks yesterday, even after employees walked along the line and flew over it several times looking for breaks. Some seepage around joints is expected, Marshall said. But the amount being lost — about 5,000 gallons per hour per mile — is about twice what is considered acceptable.

Shrunken soil from the drought and the shock of the break may have increased leaks at the joints, he said. That portion of the 78-mile line will be shut down and checked for leaks this winter when water usage is low.

The district was expected to turn on a second pump today but probably won't turn its third pump on until water rationing ends.

Therrell D. Hobbs, Jennifer Schultz and Dave Smith contributed to this report.
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THE SEVEN DRY YEARS

By Bill Fairley
Special to the Star-Telegram

Texas really knows how to throw a drought — and how to end one.

As much as we complain about the dearth of rain this year, 1998 will probably come nowhere near Texas' seven-year drought more than 40 years ago.

As long and dramatic as that drought was, its end was just as startling. The two-year conclusion to the drought of the '50s included a four-day deluge, gritty dust storms mixed with snow, a Panhandle blizzard and land-gouging gully washers.

At a few points during the shortage, some coun-

The 1950s drought ended with a deluge

ties qualified for drought and flood relief at the same time.

How dry was it? Listen to this description from Mike Williams, manager of community relations for the Tarrant Regional Water District:

"In the summer of 1956, I drove a Jeep from my uncle's house on Hickey Cove at Eagle Mountain Lake across the dry lake bed to the Fort Worth Boat

Club. That was a distance of about a mile to a mile-and-a-half."

Also consider: Tarrant County's average annual rainfall is 33.7 inches; from 1951 through 1956, the average was 22.34 inches. In 1954, the parched county's rainfall was 14.15 inches below normal.

Between 1891 and 1951, Texas suffered through eight droughts, but the National Weather Service characterizes the dry years from 1950 through 1957 as the worst drought on record in Texas.

Conditions in the southwest in 1957, the Weather Service noted, "are worse than any since the 17th

(More on DROUGHT on Page 2)



Soil Conservation Service photo shows a drought-starved cow in West Texas. The year and specific location aren't identified.

Drought

From Page 1

century." Scientists used tree-ring data to make that determination. The rings are smaller and closer together in severe drought years.

In 1956, federal officials described Texas as "a land of withered crops and bony cattle." By 1957, many farmers had given up on the land, and bankruptcies and foreclosures outnumbered divorces in Texas.

Courts Cleveland, owner of the Pear Orchard Ranch south of Granbury at the time, said he managed to withstand the drought because of a 33-foot spring-fed well that filled a stock tank on his property.

Most of his neighbors didn't fare as well.

In her doctoral dissertation on the 1930s drought, Texas Christian University student Rana K. Williamson wrote that agricultural losses amounted to \$3 billion in Texas by 1956, but that federal assistance to agriculture totaled \$61,814,600 for the decade.

Texas led the nation in the designated drought disaster areas: The drought reached all but 10 of its 254 counties.

Texas had to fight to get and keep its aid, and had to persuade Washington that an occasional rain — even a heavy one — didn't mean an end to the drought.

Texas ranchers glutted the market with cattle, driving choice beef prices down. In 1952, a 2,000-pound yearling fetched about \$142; by 1955, the price had dropped to \$66, according to

It's so dry...

Rana Williamson, a native of Junction, collected drought humor while working on her master's and doctoral degrees. She lives in Fort Worth.

It's so dry...

- ...that pet ducks and frogs that fell into buckets of water drowned.
- ...old farmers who chewed or dipped haves to prime themselves to spit.

■ ...we have to soak the pigs before they'll hold stop.

■ ...if a truck went by with a dog in the back, all the trees would lean toward the road and hope.

■ ...the sweeping willows can't; they just look despondent.

■ ...that a fellow caught a catfish that had rocks on it.

■ ...you've got to sneeze to bring the relative humidity up to zero.

■ ...the Baptists only sprinkled and the Methodists just used a damp cloth.

the Texas Department of Agriculture.

A record-breaking heat wave hit the state in 1954 and was accompanied by the worst dust storms since the 1930s.

During the drought of the 1950s, water storage in Lake Worth, Eagle Mountain and Lake Bridgeport was at an all-time low. 140,000 acre-feet of water. (One acre-foot equals 328,000 gallons.)

Fort Worth water officials recommended investigating a pipeline from the Brazos River to the city for an emergency water source, even though the high salt content might make the water harmful to plumbing and landscaping, and expensive to filter.

The city instituted voluntary water rationing but tried a more aggressive tactic, too: hiring a rainmaker.

In 1956, two rainmakers promised to use the new technique of cloud-seeding, using silver iodide crystals (dry ice), to make rain.

Krista Villarreal, a meteorologist with the National Weather Service in Fort Worth, said, "The theory is that silver iodide fed into

rain clouds give individual raindrops something relatively solid to cling to, and the added weight to each drop causes it to fall to earth."

The science is accurate, but the practice produces very little rain, Villarreal said.

Local awning manufacturer Jack Corn Jr. sought a year's contract, and granted an initial free, two-week trial. Corn tried April 14, 18 and 21, 1956, but only small amounts of rain fell.

The council then turned to Dr. Irving P. Krick of Denver, who was finishing up a three-year contract with Dallas. Krick was awarded a \$35,000 cloud-seeding contract, good for one year if Dallas renewed its contract and if other cities and the water district signed on.

Krick began, but couldn't generate any rainfall for the city. Fort Worth dropped him. Dallas did not renew his contract and other communities did not join.

The heaviest rainfall in more than six years — 7 inches — fell on Fort Worth and the watershed May 23-26, 1957. The rain filled two Corps of Engineer-construct-

ed lakes — Benbrook and Arlington — over their spillways.

Fort Worth recorded 50.44 inches of rain by year's end — almost 17 inches above average. The drought officially ended.

The water glut, like the waste deficiency, left damage in its wake.

Storage buildings and earthmoving equipment were in the dry bed of Lake Arlington, which was still under construction. They were lost in the sudden downpour and are still at the lake bottom.

Eagle Mountain Lake flooded hundreds of homes around its 200-mile shoreline.

Williams, who had driven the Jeep across the waterless bed of Eagle Mountain Lake in 1956, had to swim out of his boat, inundated lakeside homes for a while, and just outside his bedroom in 1957.

In the 1964 Texas Historical Association Yearbook, Thomas Hatfield wrote about two Bandera County men who were working in a dry creek bed in 1957 when a rainstorm drove them to shelter.

"By damn this Texas shore is a funny world, ain't it," one worker is said to have told another. "It's either too 'nuff or too nothing' in the wrong places."

Sources: *The Heat from the Furnace: Aspects of the Seven-Year Drought of the 1950s in Texas* by Rana K. Williamson; National Weather Service; Fort Worth's Tarrant Regional Water District; Star-Telegram; and interviews.

Bill Fairley is a longtime Fort Worth resident interested in the history of Texas and Tarrant County. You can leave a message for him at 390-7966 or e-mail him at: bfairley@star-telegram.com.

CITY FINAL

Fort Worth Star-Telegram

THURSDAY, AUGUST 6, 1998

Tarrant County, Texas • "Where The West Begins"

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Showers take the heat off weary North Texas

By GALE BRADFORD
AND LAURIE MAYK

Forecasters predict days free of triple digits

A prayer group that has been meeting daily at noon on the Parker County Courthouse lawn in Weatherford was soaked yesterday by a sudden downpour.

Their prayers were answered. "We got rained out," said the Rev. Terry Jones, minister at the Provision Center in

Weatherford. "We started praying about 10 after 12, and by 12:30 we couldn't even see for the rain. I got soaking wet."

Relief came for North Texas yesterday in the form of lower afternoon temperatures and scattered rain. Many residents in Palo Pinto, Denton, Parker and Tarrant counties were among the lucky recipients of rain.

Afternoon temperatures dipped as low as 73 just two hours after the high of 88 was recorded at 1:39 p.m. at Dallas/Fort Worth Airport, the National Weather Service said.

Sitting at a sidewalk table in downtown Fort Worth yesterday, Cliff Carr said he was among the lucky recipients of rain.

expect them to last.

"I'm a natural-born pessimist, so I think in two days it'll be 106 again," said Carr, 65, of Fort Worth.

There may be reason to be optimistic. The weather service is predicting a daytime high today and tomorrow in the upper 80s, and temperatures in the mid-90s through the weekend. The mercury

(More on WEATHER on Page 13)

Weather

From Page 1

may not read 100 degrees again until midmonth, said Joe Harris, a weather service meteorologist.

"The heat problem is over for a while," he said.

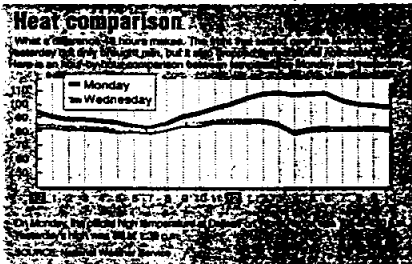
The dome-shaped collection of high pressure that had camped out over the Metroplex for a few weeks finally moved off, allowing cooler air and rain into the area, meteorologist Krista Villarreal said.

If the high pressure comes back, it could mean a return of triple-digit temperatures, she said.

"It just depends on how long it decides to stick around, and how strong it is," Villarreal said.

Pennsylvania native Norman Olsen called the cool and breezy conditions that were delighting Texans "Yankee weather."

"Anything under 90 or 85 is Yankee weather for me," said the



71-year-old Fort Worth resident, who has lived in Texas about eight years.

The welcome rain forced several Tarrant County carwashes to close, but that didn't seem to bother the owners.

Even as he sat in his closed business yesterday afternoon, Bob Bur-

rows, manager of Hightower Auto Wash & Detail on Hightower Drive in Watauga, wished for more rain.

"The yards need at least another day of rain," Burrows said. "A little rain now and then helps us because the cars will get dirty."

The suddenly slick streets evidently contributed to a rash of traf-

fic accidents, according to Med-Star and Fort Worth Fire Department dispatchers.

"We've decided that the level of precipitation is directly proportionate to the level of stupidity," a frustrated dispatcher joked.

A nursing supervisor at Harris Methodist Fort Worth said several people were being treated last night for injuries received in car wrecks.

The half-inch of rain that fell in Parker County may not be nearly enough for farmers whose crops have endured a long drought.

"It's just only the start," said Loretta Hutton, who grows peaches, peaches and other produce on a farm outside Weatherford with her husband and two sons. "We need about a 3-inch rain to do some good."

The rain arrived too late to help the peaches that are already ripening, she said, but it may benefit some of the later varieties.

Some Parker County residents are crediting Jones' group for the

local rainfall.

"The commissioners have called. People in other high offices have called," Jones said. "Matter of fact, the phone's been ringing off the wall with people calling in to thank us for praying."

The minister said he was concerned earlier in the week when he heard reports of rain in Fort Worth and Dallas.

"It came to me that I was going to be the talk of the town because we were praying for rain and Fort Worth and Dallas were getting it and it hadn't rained a drop in Parker County," he said.

Despite yesterday's reprieve, the death toll in Texas from the heat wave continued to mount.

The Dallas County Medical Examiner's Office yesterday confirmed the county's 29th heat-related death since June 1, an 85-year-old south Dallas woman who died July 13.

The death of Edith Mae Snow Frederick, who was found in her home, was due to coronary artery

disease and hyperthermia, the medical examiner's office said.

Statewide, more than 100 heat-related deaths have been reported.

The hardship on Texans created by the extreme temperatures this summer is attracting the attention of various agencies and corporations that want to help.

San Antonio-based Friedrich Air Conditioning joined Carrier Corp. in supporting statewide efforts to supply air conditioners to those who need them most.

Carrier agreed to contribute up to 2,000 room air conditioners and is ready to sell about 15,400 units to the state at a discount. Friedrich will help local providers by lowering prices and offering 24-hour delivery on all available units.

Residents wanting information about state-level energy assistance programs may call (877) 399-8939, a toll-free number.

Duncan Boyd, Metro Nix, Domingo Ramirez Jr. and Angelique Sty contributed to this report.
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Lake Arlington's drop spurs memories, look at remedies

By MATTHEW BRADY
Star-Telegram Staff Writer

ARLINGTON — Messages in bottles? Sunken vehicles holding the keys to unsolved crimes?

Hardly.
The stuff washing ashore at Lake Arlington this summer is of a more pedestrian nature: old tires, fishing tackle, toys and beer bottles.

It is the usual flotsam, just more of it since the lake began dropping more than four inches a day because of drought and a ruptured pipeline that supplies the lake.

Now the pipeline is repaired, but it will take several days for the water level to change.

In the meantime, boat docks stand high and dry, 100 to 200 yards from the waterline. Grass grows where waves used to lap.

South of Bowman Springs Park, piers jut through the shallow water, the remnants of a bridge that once spanned the lake.

Some people say the lake is at its lowest level ever.

But John Kubala, who retired as director of the Water Utilities Department in 1996 after 34 years with the city, said the lake fell to a similar level in the early 1970s.

He remembers city crews mowing the bottom of the lake south of the ramp at Bowman Springs Park.

"That area was basically all dry," he said.

Randy Swiney, 43, of Kennedale, said he can remember walking across the south end of the lake when he was a student at Kennedale High School in the early '70s.

"We were getting wet, but we walked across it," he said.

The lake recedes every summer, but this year has been extreme. Lakefront property is now bound by beaches.

"We usually have that problem later in the summer but not this early and this low," said Nancy Marun, who lives on the southeast shore.

It is the Martins' first lake home. They moved in about four years ago and built a boat dock last year.

Martin said they moved to Lake Arlington "to be able to use our boat and go water skiing and have a lot of fun with our kids while they are still young enough to enjoy it."

But except for a few times early in the summer, they have been unable to use their dock.

"It's just very sad that the water has gotten down this low," she said.

The Conaster family lives a short walk up the dry shoreline from the Martins, a path becoming overgrown with grass sprouting in the damp, crusted lake bottom.

"We knew it did this before we moved here," said Neva Conaster, who has lived on the lake about 12 years with her husband of 56 years, L.D.

"We've always said since we moved here, 'We have a house on the lake seven months of the year. We have a house on

the beach five months of the year,'" she said, laughing. "But it would be nice if they would buy water and keep it at a constant level all the time."

The city is considering options.

Harold Patterson, mayor of Arlington from 1983 to 1987, said that the drop this year pushed him to action.

"The lake is about 150 yards from my pier," he said. "You can drive cars down behind my house on the lake."

A rupture on Sunday in a 90-inch pipeline that feeds the lake accelerated the normal summer shrinkage. But the pipe resumed pumping 36 million gallons a day into the lake yesterday afternoon.

Patterson contends that if the lake had been full to begin with, the current crisis would have been averted. And he feels like his position has legal backing.

He looked up the original contract between the city and the Tarrant Regional Water District, which controls the flow of water, and discovered what he feels is an obligation by the district to keep the lake

at 545 feet above sea level. The lake is full at 550 feet but has dropped as low as 536 feet this summer.

Accompanied by several of his neighbors, Patterson met with water district officials in Fort Worth this year. He also talked with Pat Remington, at-large member of the City Council.

Remington said that the contract, which is 20 years old, requires the district to maintain a minimum level of 531 feet, and a level of 535 feet in the recreational months of June, July, August and September.

"Right now, we are working on several options that are available that we hope will preserve a greater minimum level of water in the lake for future years," Remington said. District water officials have been supportive and are conducting a feasibility study, he said.

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The Community News



Serving Eastern Parker County: Aledo ★ the Annettas ★ Hudson Oaks ★ Willow Park

Hudson Oaks citizens protest proposed new water usage rates

<http://www.community-news.com>

August 6, 1998

by Robyn Adams Schmidt

Record heat — and dead grass — caused more than one temper to flare over the hot issue of watering lawns at the Hudson Oaks city council meeting Monday night.

Council chambers were packed with more than 30 citizens concerned about the council's proposal to establish higher water rates for residents who use "excessive" amounts of water.

Council and city staff members spent nearly two hours listening to comments and discussing water related issues. Ultimately, the council voted to send the proposed "excessive use" ordinance back to the city's utility board to incorporate some of the suggestions of residents and council members.

Residents are encouraged to attend the utility board meeting at 7 p.m. Aug. 11 at city hall. Residents who cannot attend but want to comment on the proposal can contact city administrator Mary Jane Holybee or public works manager Donny Cole this week.

The proposed ordinance that was given to council for consideration Monday night recommended setting 30,000 gallons per month as the limit for reasonable use. Any usage over that would be considered "excessive" and water customers would be charged a rate higher than the current base rate for their excessive usage.

The public works manager gave residents an overview of why the ordinance is being proposed. Cole said the city is currently on water rationing not because the city's water facilities are inadequate but because residents are using excessive amounts of water. The ordinance is designed to discourage people from watering wastefully by hitting them in their wallet.

"We've got enough water for indoor use and sensible outdoor watering," Cole said. "People are just using too much water. We've got to learn to water wisely and quit throwing water away."

If all water customers were using reasonable amounts of water, Cole said, the city would not be under water rationing right now, which is why the city council asked him to come up with an "excessive use" ordinance.

Cole said he is concerned that, if Hudson Oaks doesn't decrease its water usage levels, the state will start to crack down on the city with punitive measures.

Cole explained the recommended level of 30,000 gallons per month was based on levels of water usage in other neighboring cities in Parker and Hood counties and recommendations from landscape architects.

However, many residents in attendance protested that a limit of 30,000 gallons per month was too low and their expensive landscaping would die if they tried to limit their water usage to that amount. One resident noted that landscape

architects believe that 30,000 gallons per acre per week are necessary in drought conditions to keep landscaping alive.

Council member Phillip Hoy said a limit of 30,000 gallons per month would only affect 23 percent of the city's water customers, according to city water records.

One resident, however, spoke up and said she believes more customers than that will be affected. She said last year in July, her home used 26,000 gallons but this July, her usage was 88,000 gallons and that amount still hasn't kept her plants alive.

"I think you are going to penalize over half the residents because of the drought," she said.

Another resident voiced the opinion that approving an excessive water usage ordinance would hurt property values, because people will hesitate to buy homes in Hudson Oaks because of it.

Several residents questioned whether or not the problem was excessive use or simply the capacity of city's water facilities. However, Cole said repeatedly that Hudson Oaks' water facilities exceed state requirements and are more than adequate for reasonable water usage right now. And another well is being drilled to add to the system.

When debate on the issue became repetitive, council member Katherine Meyer broke in with the recommendation that the utility board review the proposed ordinance again and perhaps raise the reasonable use limit to 50,000 gallons a month limit. She also suggested that the board consider an "annual average" usage level to help residents cope with the drought conditions.

Delaying action on the ordinance would also give the city time to evaluate the effectiveness of the current water rationing plan in lowering water usage, she said.


Throughout the discussion about the excessive use ordinance, residents also aired complaints to the council about the water rationing plan which has been in effect since July 16.

The plan, which is the "stage one" rationing level set up by an ordinance in 1993, allows residents to water outdoors from 8-10 a.m. and 8-10 p.m. three days a week. Even number addresses can water Monday, Wednesday, Friday and odd number addresses can water Tuesday, Thursday and Saturday.

Several residents protested the hours were unfair to families where both adults work outside the home because they can't take advantage of the morning watering window. Another resident asked that the rationing plan be strictly enforced. He cited many violations he had personally witnessed.

One resident asked that the rationing plan be expanded to allow for daily "hand watering" of fragile plants in the landscape and around foundations to prevent cracking.

Additional Hudson Oaks news is on page A3.



Water Update...

Rationing remains in effect in all local water systems

The City of Aledo is considering changing the allowed morning watering hours from 8-10 a.m. to 6-8 a.m. to accommodate families who are at work during the allowed hours. City officials expressed thanks to those who have abided by the rationing plan.

Currently Aledo and Willow Park both restrict watering to even-odd days (houses with even numbers water on even-numbered days, etc), and restrict watering to the hours of 8-10 a.m. and 8-10 p.m. on the designated days.

Check www.community-news.com for any updates between this and next week's issue.

Making way for water



The Community News - Christopher Amos

An 18 Wheeler zooms past the arch of a backhoe where workers from Aledo Construction are boring a 10" water main under six lanes of traffic. The water main will connect the two Willow Park water systems which have served two parts of the city. Willow Springs and Willow Springs Oaks, south of the Interstate, have had problems due to inadequate water supply. Once the two systems are united, and drought situations come to an end, the main will allow the city more flexibility in serving the water needs of its customers.

Hudson Oaks council votes to hook onto Willow Park sewer system

by Robyn Adams Schmidt

Following a 30-minute executive session on personnel matters, the Hudson Oaks City Council unanimously voted to appoint current Sergeant Ron Arnett to the position of police chief, to fill the void left by the recent death of Police Chief Vernon Smart.

The council also unanimously approved the recommendation of a city sewer system committee to hook Hudson Oaks onto the Willow Park sewer system at its Monday night meeting. Financing of the sewer system work would be through a "402 assessment."

Representatives from Willow Park told the council that the city is looking forward to working with Hudson Oaks on a joint sewer system. The council instructed city staff to set up a meeting as soon as possible to begin work on the system.

The council also heard a request by Jerry and Nannie Burks to "de-annex" their property, which the city annexed in 1993. Jerry Burks reiterated the family's objections to the annexation that they voiced in 1993.

Because Burks' father died about the same time as the original annexation, Burks said the family has not pursued the matter until they began having problems recently with their plans to develop the property.

Based on the advice of city attorney Michael McEntire who said the city had legal right to annex the property, the council declined to take any action on Burks' request. The council reiterated that the Burks will have to bring their buildings up to city code standards in order to develop them as they desire.

Willow Park to drill additional water well

Special meeting addresses roads, police protection, fire sprinklers and fireworks ordinances

by Margaret Wintersole

The Willow Park City Council voted to get bids for drilling a Trinity water well at a special meeting July 30.

According to Lloyd Stafford, area manager for Severn Trent Environmental, the drilling would take 60 to 90 days.

Councilman Gene Martin pointed out that because of the time frame, drilling would not help the city's water problem this summer.

Councilman Doral Risch's motion passed with a four to one vote. Councilman Sam Bertling opposed the motion.

Police Patrols

Councilman Bertling asked Police Chief Ray Jones to clarify the police department's procedure for patrolling I-20.

Chief Jones responded that he assigns a patrol on busy holidays, but officers should not be working I-20 unless he has assigned them to do so or they have been dispatched by Parker County.

With regard to patrolling the highway, Gene Martin said, "I would rather our officers are patrolling the city providing security service to the city than catching speeders on the interstate."

Councilman Jim Davis explained, "I would like to make everybody understand that we are not trying to get out there and write tickets. We're trying to keep from it."

Councilman Gerald Liepert said he favored visibility of the police department in residential neighborhoods.

"I think every citizen ought to see that car go by at least once a day. But," he said, "if it has to go on the freeway to get over to the south side and it finds one of these idiots

driving 90 miles an hour, let's pick them up."

The item was a discussion item only. No action was taken.

"I would like to make everybody understand that we are not trying to get out there and write tickets. We're trying to keep from it." - Jim Davis

Roads

Councilman Doral Risch brought up drainage work on Ranch House Road for discussion before the city council.

Bertling argued for a list of priorities and estimates for work.

Bertling moved to have the city administrator make available to a road contractor a list of problem drainage areas on Ranch House Road for an estimate to be given to the city council by the next regularly scheduled city council meeting.

Council members voted unanimously in the motion's favor.

On a second item, Bertling asked for an update on a study to determine maximum safe speeds in Willow Park and on signs recommending a 25 mph speed limit, items brought before the council in June.

Mayor Les Cooley told the council that an engineer would charge the city \$150 an hour to do the study.

Councilman Gene Martin asked that the city contact the state to find out how it determines safe speed limits and if it has any "do it yourself guidelines."

The mayor agreed to call and ask Chief Jones reported that the signs were on order.

The item was a discussion item only. No action was taken.

Fire Sprinkler and Fireworks Ordinances

At the request of Davis and Risch, the council took time to review the city's ordinance for automatic fire extinguishing systems.

Councilman Davis requested that the council consider the ordinance because of its financial impact on Willow Park businesses.

"If I open a business in the city, to do my day-to-day business," Davis said, "I may only need a five-eighths [inch waterline] meter.

"For that I pay a \$100 deposit, a \$1,400 impact fee and have a minimum water bill of \$22.86.

"However, if I build a warehouse that, for example, requires a four inch line for my sprinkler system, my actual water usage would be just two commodes, two lavatories and a coffee pot.

"I don't need a four inch line to run that, but I might need a four inch line to run my sprinkler system.

"In that case, my deposit goes to \$783.92. The tap fee is now \$3,880. The impact fee, from being \$1,400, is now \$57,400.

"Maybe my start up cost is \$62,063.92 just because I'm putting in a sprinkler system to meet the city requirement.

"My monthly water bill, in that case, is going to be a no-use fee rate of \$391.96.

"So that gives the city a monthly windfall of \$369.10."

Davis proposed that the ordinance be amended to bill for the deposit, tap and impact fees based on a business' day-to-day require-

ments. Only the tap fee would be collected for the connection of the automatic sprinkler system.

Lloyd Stafford recommended that the city charge a tap fee, including meter installation, waive the impact fee, waive the monthly minimum bill and only charge for water that goes through the meter of the fire sprinkler system.

In addition to Davis' suggestions, Risch told the council he thought the ordinance was weak and presented council members with a list of suggestions and questions for discussion.

Risch recommended that fire extinguishing systems follow requirements specified by the National Fire Protection Agency rather than the Uniform Building Code.

The discussion also covered tap fees, minimum tap requirements, inspection, monitoring and dry systems.

Councilman Sam Bertling moved to give the council's recommendations to the city attorney and have him prepare a draft for the council for review.

The motion passed unanimously.

On a second ordinance issue, Councilman Davis told the council that the city's fireworks ordinance needed revision.

The council took note of a letter from City Attorney Rider Scott suggesting changes to improve the ordinance.

Davis moved to postpone the item until the August 18 meeting when the city attorney would be present.

The motion passed unanimously.

The next regular meeting of the Willow Park City Council is scheduled for 7 p.m. August 18.

DEMOCRAT

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FRIDAY
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Welcome relief ...



Democrat Photo by Brad Michael Moore

Rain water runs towards a creek as the area experienced its second day of cloudy skies and cooler temperatures. This scene is near Soldier Park.

THE WEEKLY REVIEW

Sunday, August 9, 1998

EDITORIALS • COMMENTARY • LETTERS TO THE EDITOR • TEXANA • BOOKS

Star-Texgram

Section E

■ Most of us are worried about our lawns in this summer of unbearable heat. But there's one group in Tarrant County that's worrying about your lawn and a steady flow of water in the summer of 2050.

BY JACK Z. SMITH

NEARLY 150 MILES northeast of Fort Worth, in untamed river bottoms where wild hogs, raccoons and beavers abound, "varmint huntin'" has long been a pastime.

Edd Hess, director of a hospice in the northeast Texas town of Mount Pleasant, recalls hunting as a teen-ager in the late 1960s with a buddy, Tommy Roach, in the forbidding swamps of the Sulphur River basin.

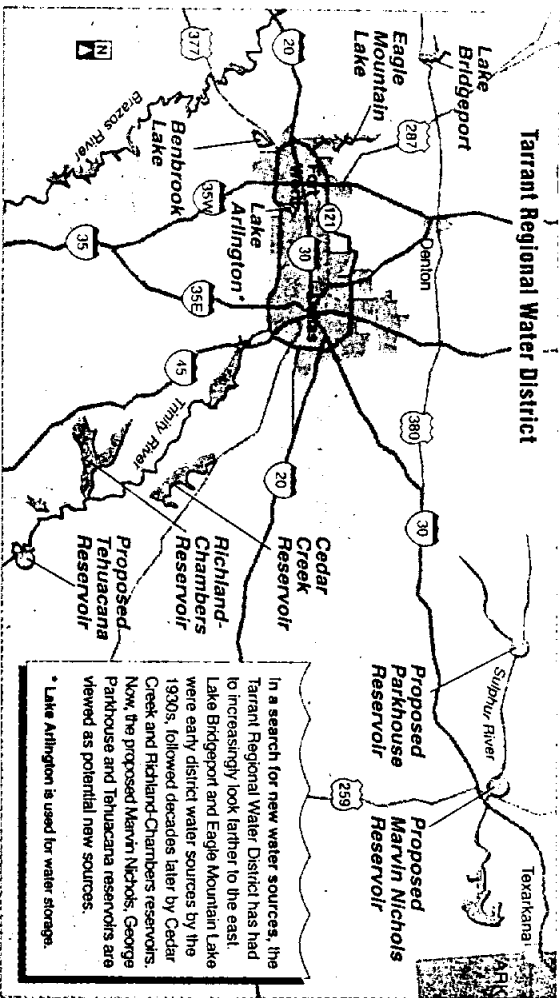
"We'd go out at night and just kind of set up in a clearing," Hess said. "We'd sit back to back ... sometimes you'd have a little bit of a moon and sometimes you wouldn't."

Surrounded by towering hardwood trees, they would blow on a call that might mimic the sounds of a bird or a dying rabbit. If the call attracted an animal, they would shoot at whatever "varmint" they heard rustling in the dark.

"It was for the adventure ... if we shot anything, we never knew it," Hess recalls with a laugh.

This summer, as Tarrant County residents have watched their lawns turn brown, those remote river bottoms in northeast Texas have become the focus of a far-different hunt — the quest for huge future supplies of water for the increasingly thirsty Metropolis.

When it comes to water, most Fort Worth-Dallas



area residents are primarily concerned about the here and now — the immediate resuscitation of their sagging St. Augustine at a time when drought, heat and water pipeline breaks have made front-page headlines. But officials of the Tarrant Regional Water District are gazing far into the future, to make certain there will be fresh water coming from your tap deep into the 21st century.

In obscure offices on the near north side of Fort Worth, district officials have been eying those northeast Texas river bottoms for years as they consider new sources of water for their major customers — Fort Worth, Arlington, Mansfield and

the Trinity River Authority, which supplies water to much of northeast Tarrant County.

In planning for long-term development of water supplies, "we try to keep 50 years ahead," said David Marshall, engineering services manager for the Tarrant Regional district.

Rapid growth has mandated that. Water demand by district customers is projected at nearly 89 billion gallons this year, up 18 percent from a decade earlier. And demand is expected to jump another 33 percent by 2010.

Although this year's drought has made Tarrant (More WATER on Page 8)

THE WEEKLY REVIEW

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Star-Telegram

Section E

EDITORIALS • COMMENTARY • LETTERS TO THE EDITOR • TEXANA • BOOKS

Section E, Page 8 / www.star-telegram.com / Sunday, August 9, 1998

Water

From Page 1

County residents much more aware of the critical importance of water, long-range planning is nothing new for the water district, Fort Worth Mayor Kenneth Barr said.

"I think we've been very fortunate to have top-notch water planning for many decades," he said. Such forward thinking is vital in a region where drought may strike any year and there are no large natural reservoirs, he said.

A new state water plan adopted in 1997 highlights potential sites for major new sources of raw water, including the proposed Marvin Nichols and George Parkhouse reservoirs in the Sulphur River basin.

Of the two reservoirs, Nichols is probably getting the heavier attention from water development officials in the Metroplex because it would provide by far the most water — more than twice the yield of the Richland-Chambers Reservoir now furnishing about 138 million gallons daily to the cities served by the Tarrant Regional district, Marshall said.

The total cost of the Nichols project could approach a staggering \$1 billion when all expenses are tallied, including land acquisition, construction and building pipelines and pump stations, Marshall said.

Put into perspective, a price tag of \$1 billion would be nearly double the annual city budget of Fort Worth.

Water development officials in the Metroplex say such a gigantic project likely would necessitate a cooperative venture between the Tarrant Regional district; the city of Dallas; the North Texas Municipal Water District serving Richardson, Garland, Plano, McKinney and other cities outside Dallas; and small Northeast Texas cities close to the Nichols site.

To finance the project, long-term bond debt probably would be issued by the Metroplex entities that would receive the largest volumes of water from the reservoir. Some state funding also might be available.

The Nichols reservoir would inundate an estimated 67,957 acres in the Sulphur basin — an area about one third the size of Fort Worth.

The reservoir would submerge an estimated 36,178 acres of bottomland hardwood forests and swamp rich in wildlife. As a result, serious environmental issues are expected to be raised by the proposed development, including the question of whether any animals protected by the federal Endangered Species Act are within the reservoir's massive footprint.

Marshall said federal law likely would require some form of "mitigation" to offset the loss of the habitat, such as setting aside a large amount of land elsewhere as a protected preserve.

State legislation passed in 1997 has mandated the formation of 16 regional groups from throughout Texas to plan water development for their respective areas for the next half century. The group representing Tarrant, Dallas and other Metroplex counties and the group representing northeast Texas counties have begun meeting in an effort to reach an eventual consensus on future reservoir construction in the Sulphur basin.

In northeast Texas, the Nichols Reservoir project has both supporters and detractors, Red River County Judge L.D. Williamson said. Most of the reservoir likely would lie within the southern portion of the county, which borders Oklahoma.

"People who live in that area and have land there, especially those who have been there for generations, see it as taking their property from them," Williamson said. "Others see it as a grab for the big cities to take East Texas' water."

But Williamson said he hopes most local residents will see the reservoir as he does — a project likely to provide a strongly needed economic boost to his sparsely populated county of approximately 14,000 residents.

The project would create construction jobs and eventually lead to substantial residential and commercial development around the big lake that would be created, Williamson said. That, in turn, would sharply increase the local tax base, he said. In addition, the reservoir could ensure a long-term water supply at minimal cost for small northeast Texas towns such as the Red River County seat of Clarksville, he said.

State Sen. Bill Ratliff, R-Mount Pleasant, said he feels that many people in his northeast Texas district "realize that the majority of [Sulphur basin] water is probably going to go to the Metroplex."

Northeast Texas averages 10 to 15 inches more rain annually than the Metroplex and has a much smaller population. As a result, Ratliff said,

most northeast Texas residents likely will not be concerned about a large portion of the Nichols water going to Fort Worth and Dallas as long as enough is set aside for local needs and the reservoir provides benefits such as recreational opportunities and residential development.

Tarrant County possibly could do without water from the Nichols or Parkhouse reservoirs until the year 2040, primarily as a result of projects that the Tarrant Regional district is planning to increase the volume of water taken from the Trinity River basin southeast of Fort Worth, Marshall said.

These include a so-called water "re-use" project to filter more treated wastewater through cleansing wetlands and into the existing Richland-Chambers reservoir in Navarro County, as well as the possible construction of a modest-sized new reservoir, the Tehuacana, which could be connected by a canal to Richland-Chambers.

But development of the Tehuacana reservoir could be thwarted by the fact that it has a "tremendous lignite deposit" under it that could become ripe for mining, Marshall said.

Although the Tarrant Regional district potentially could go another 40 years without needing new water from northeast Texas, water development officials say planning is needed now because a reservoir project can be decades in the making.

Fort Worth businessman Charlie Geren, a member of the Texas Water Development Board, said he feels both the Nichols and Parkhouse reservoirs will be needed to help ensure adequate long-term water supplies for the Metroplex.

The development process, Geren said, "needs to start soon." The process of obtaining required government permits and building a reservoir likely would take 20 years to complete "if it started today," he said.

Officials of the North Texas Municipal Water District — serving exploding populations north and east of Dallas — say they expect to need northeast Texas water sooner than Tarrant County.

Jim Parks, the district's executive director, said he would like to see the Nichols Reservoir developed on a fast-track timetable of 15 years or less.

Water development officials such as Marshall say a growing state population and a dwindling number of potential sites for large new reservoirs will make water an increasingly precious resource.

To secure a large, reliable water supply, you can't simply dig a huge hole just anywhere and pray for rain. In Texas, reservoirs typically are located in river basins into which large volumes of water drain. The biggest basins that receive the most rainfall — and in which there still are choice sites available for reservoir development — are in East Texas.

As the Tarrant Regional Water District has developed water sources over the last 75 years, it has steadily ventured farther and farther from Fort Worth. In the 1930s, the district developed Lake Bridgeport and Eagle Mountain Lake, modest distances upstream from Fort Worth on the West Fork of the Trinity River. In the 1970s and 1980s, the district went roughly 75 miles southeast to develop Cedar Creek and Richland-Chambers reservoirs.

Now, the best reservoir prospects for the Metroplex are 100 to 150 miles away in northeast Texas — much closer to Oklahoma and Arkansas than Fort Worth. Generally, the farther away the reservoir, the more it will cost to pump the water west to Tarrant County.

As water becomes more dear and likely more costly, there will be an ever-growing emphasis on increased conservation through such means as more-efficient farmland irrigation methods, plumbing codes mandating low-flush toilets and municipal landscaping ordinances encouraging a reliance on native plants that use less water.

But even with such measures, officials see the day when those rain-rich northeast Texas river bottoms will become the sites for large new reservoirs.

Former Fort Worth City Council member Bill Meadows, a member of the Metroplex's regional water planning group, said it appears inevitable that Tarrant County must look more than 100 miles eastward for much of its future water supply.

"The truth is that the only water left for the Metroplex, really usable in abundance, is the Sulphur River basin," he said.

Jack Z. Smith is an editorial writer for the Star-Telegram. His e-mail address is jzsmith@star-telegram.com and his telephone number is (817) 390-7724.

DEMOCRAT

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Eastern county towns plan for future water supply

By ROGER M. ELLIOTT
Democrat Reporter

SOUTHEASTERN PARKER COUNTY — Tuesday night a public meeting was held at Willow Park City Hall to discuss the ongoing study to look at water needs for southeastern Parker County for the next 30 years.

This was the second of three public meetings for the study. The purpose of the meeting was to discuss preliminary findings at the mid-point of the study process and solicit public comment and discussion related to the alternatives presented at the meeting.

The study was commissioned by the Parker County Utility District Number 1 (PCUD1) in the spring of 1998 at the request of the sponsors, who include the Cities of Willow Park, Aledo, Hudson Oaks and the County of Parker. The funding for the sponsors was matched by a grant from the Texas Water Development Board making the study possible.

The study covers southeastern Parker County — generally bounded by White Settlement Road on the north, the County Line on the east and south, Highway 171 on the southwest and Weatherford on the west. The

study includes the cities of Willow Park, Hudson Oaks, Aledo, Annetta North, Annetta and Annetta South, as well as unincorporated areas within the area.

Teague Nall and Perkins Inc. (TNP), a civil engineering firm from Fort Worth, was retained to perform the study. Kelly Carta, P.E. and Kelly Dillard, P.E. of TNP made the presentation and discussed the preliminary findings.

The key issue in the study is the ability of the cities in the southeastern Parker County area to meet water demands as the area pop-

ulation continues to grow. These issues have been highlighted this summer as drought conditions caused most cities and water systems to, at times, issue some form of water rationing. Water for firefighting has also become a major concern during the past few weeks.

Carta gave a quick overview of how the analysis has been performed, including methods for projecting area growth, determining future water demands, possible alternatives to meet demands, project phasing and costs.

See Water, page 5A

Water

Continued from page 1A

A look at the options

Carta noted that all water for the area currently comes from well systems. He reviewed comments from the first public meeting (which was held in April at Hudson Oaks) showing that the continued use of wells has a number of drawbacks. These included the large number of wells that would be required to meet demands, the land requirements that could be needed for each well, the increase in costs to drill and operate wells as deeper formations are required, and the prospect of future ground water contamination.

In short, Carta said the continued use of wells was shown not to be a viable long-term solution to meeting regional water demand.

Secondly, Carta discussed the option of purchasing treated water. The only currently available public sources practical for this option would be to purchase water from either the City of Weatherford or the City of Fort Worth.

Correspondence generated during the course of the study indicates

that the City of Fort Worth is currently trying to meet commitments already in place and is not interested in serving areas of Parker County outside of their extra-territorial jurisdiction (ETJ) at this time.

Weatherford currently does not have a supply which will allow them to serve the study area and Weatherford's contract with TRWD to purchase water out of Lake Benbrook prevents them from wholesaling water purchased from TRWD.

The remaining option identified in the study was for the cities to purchase raw surface water and treat it. The study area is in the Trinity River basin and has been assigned to Area C (Upper Trinity Region) under Senate Bill 1.

Source of surface water

The available raw water supplies for the study area are controlled by the Tarrant Regional Water District. TRWD (formerly Tarrant County Water Control and Improvement District Number 1) was created in the early part of the century to address flooding prob-

lems in Tarrant County.

It was later expanded to include water supply (primarily to Fort Worth) and began to administer surface water availability in area lakes. Currently TRWD operates supplies in Lake Benbrook, Eagle Mountain Lake, Lake Bridgeport, and others.

In recent years, TRWD has also obtained supplies from Richland-Chambers Reservoir and Cedar Creek Reservoir. Supplies from these lakes are sent to Fort Worth's Rolling Hills water treatment plant and to Lake Benbrook. This effectively makes Lake Benbrook a constant level lake and the site of choice for the study area to obtain raw water.

Purchase, transportation, and treatment

The remaining issues are the purchase of raw water, transportation and treatment of raw water and then the distribution of the treated water to area water providers. Past experience shows that these types of operations can be most effectively performed by a larger entity, such as a regional entity like PCUD1 or Tarrant Regional Water District.

Tarrant Regional has expressed an interest in contracting with area entities to sell/purchase raw water. Treatment could be done with a number of treatment plants or a single regional treatment facility.

Since there is effectively a single source and water pipes must be run to each city, the piping needs would basically be fixed regardless

of where along the system treatment plants were placed.

Regional plant needed

Carta showed cost graphs indicating that multiple plants would be more expensive than a single plant for a number of reasons. Therefore, a single regional plant is preferred at this stage of the study. Due to geography, the optimum location would be near the top of the hill to the north or northeast of Aledo.

To date, the study shows that water demand in the study area will grow rapidly during the next 30 years, requiring significant upgrades to the existing systems. Also, the technical aspects of the project are possible from an engineering and construction standpoint.

However, the full costs for implementing a complete system from Lake Benbrook to the client cities would result in prohibitively high water bills to customers. Therefore, the remainder of the study will focus on methods to install the needed facilities at reduced costs.

Cost-sharing possibilities

Carta indicated costs could possibly be reduced by adjustments to project phasing. However, any significant reduction in costs will most likely require cooperative agreements with larger entities. One transportation option would be for a regional entity to place a plant along the raw water line proposed by Weatherford and work with Weatherford to share costs on a single line from Lake Benbrook to the plant.

Both entities would purchase raw

water directly from TRWD and could benefit from cost sharing for this portion of line.

Another option would be for the cities of the area to approach TRWD and ask for delivery of raw water to the plant to be included in the unit costs for raw water and allow TRWD to construct the raw water line.

Although, neither TRWD or PCUD1 treat water at this time, Carta noted it might also be recommended that the beneficiary cities approach TRWD or PCUD1 about the possibility of participation in treatment as well. It was mentioned that addressing these issues would involve negotiations between all

involved parties.

In conclusion, the participating cities were asked to formalize in the near future their preferences for ownership of future transmission and treatment facilities and whether they would be interested in formally approaching PCUD1, the City of Weatherford and/or Tarrant Regional Water District for participation in the project.

The study is scheduled for completion in late fall of this year. The third, and final, public meeting will be held just prior to formal completion to discuss final study results and recommendations. The next meeting could be held as early as October.

Formula

Continued from page 1A
equally by road miles. Give each precinct \$4,745 per road mile and that would make it fair for all Parker County citizens, he said.

Dobbs reminded Peden that when she took office in January of 1995 she suggested dividing the budget into equal parts of one-quarter each. If that formula were used this

year, the budgets for each precinct would reflect \$6,907 per mile for Peden, \$5,716 per mile for Choate, \$4,144 per mile for Horton, and \$3,584 per mile for Dobbs.

The Democrat will report more on the Sheriff's Department and other department budgets in future issues. All are tentative at this time.

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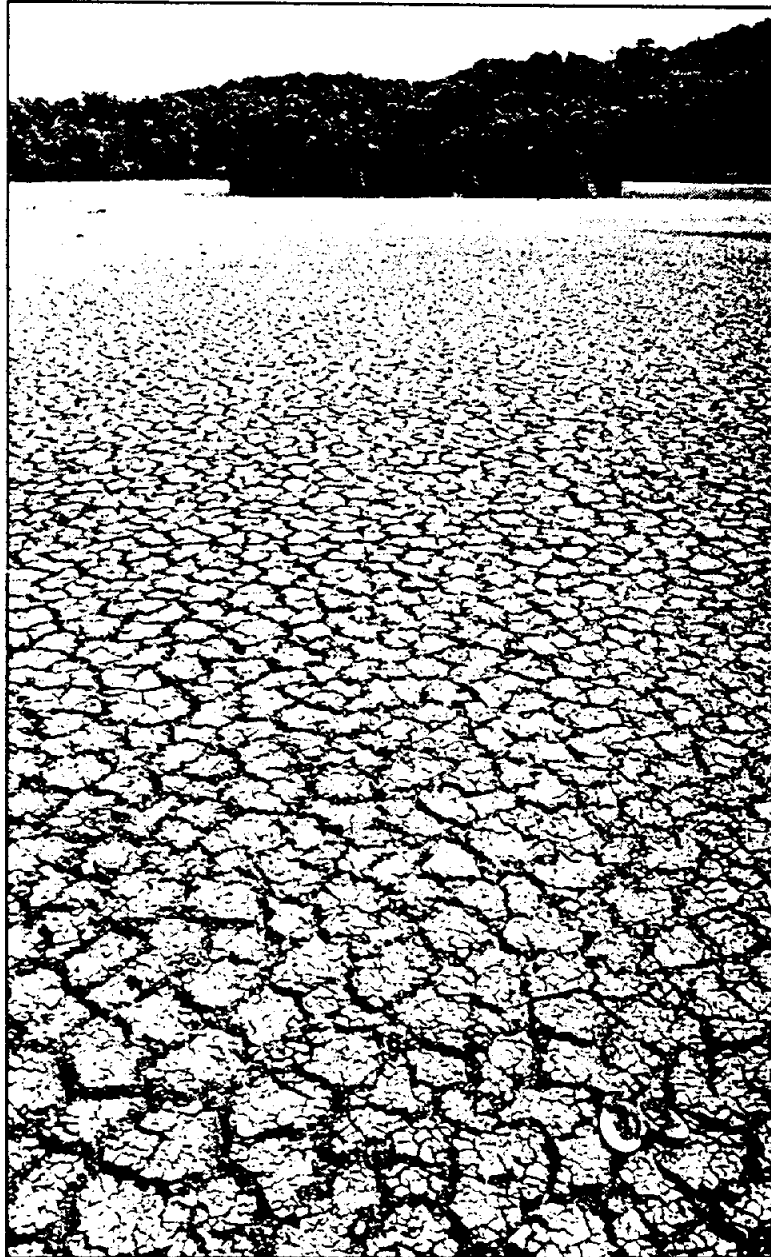
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Short-lived relief...



Democrat Photo by Brad Michael Moore

While many received welcoming rain this past week, the event wasn't great enough to create run-off. Its the run-off that refills our lakes and ponds. This dried lake bed stands immediately west of FM 713 passing Lake Weatherford. When the lake stands at its normal level, with enough water to pass its dam overflow, this lake bed is covered with water. It may be a good while before this dry bed again becomes a reflecting pool.

The Community NEWS

Serving Eastern Parker County: Aledo ★ the Annetas ★ Hudson Oaks ★ Willow Park

Volume 9, Issue 33

<http://www.community-news.com>

August 13, 1998

Consulting firm recommends site north of Aledo for water treatment

by Robyn Adams Schmidt

At an August 4 meeting, Kelly Carta of the engineering firm Teague Nall and Perkins, Inc. (TNP) explained to representatives and residents of area cities how raw water might be procured and distributed to those cities in the future.

If raw water is purchased from the Tarrant Regional Water District (TRWD), the area cities would then need to decide how to treat the water, Carta said. Treatment could be done with several treatment plants or a single regional treatment facility. The firm is recommending a regional treatment plant, because multiple plants would be more expensive than a single plant, he said.

For example, none of the area cities currently have treatment facilities suitable for raw surface water, Carta said. However, the area cities do already have water

storage and transportation infrastructure in place which could be adapted for use with a regional treatment facility.

Due to geography, the optimum location for this regional plant would be near the top of the hill to the north or northeast of Aledo. A regional plant could wholesale the treated water to each city or private utility which would bill their individual customers, Carta said.

A regional plant would ideally be operated by a large entity, such as a coalition of cities or the Tarrant Regional Water District, Carta said.

Although the TRWD doesn't currently treat raw water, it would be a good option for the area cities to consider approaching the TRWD about treating water, Carta said.

As the engineering firm begins the final phase of the water study,

Carta said, they need input from cities on the following questions to make sure they are researching pertinent issues for the area cities.

- Do any of the area cities prefer to have their own water treatment plant?
- Do any or all of the cities wish to participate in regional treatment plant?
- What are the water plant and transmission line ownership and maintenance preference of the cities?

The final part of the study to be completed this fall will focus on how cities can fund the proposed surface water supply, Carta said. To construct a regional plant and infrastructure large enough to last 30 years would be prohibitively expensive, Carta said. So his firm is devising recommendations for how to complete the system in phases to make it more affordable.

"We're looking at ways to cut front end costs because we don't have any infrastructure to start with," Carta said.

One option to reduce the cost of installing transportation lines is for the area cities to work with Weatherford, which is currently in the process of installing its own transportation lines to secure raw water from Lake Benbrook. Both entities could purchase raw water directly from TRWD but could both benefit from cost sharing for the overlapping portion of line.

Another option is for area cities to approach the TRWD about installing a raw water line to the area and including the cost of the line in the TRWD's cost of the raw water to the area.

Carta outlined the possible "construction phases" the engineering firm is recommending at this time. These phases are spaced

out so that the costs of the construction could be paid for by customers fees before the next phase begins.

- Year 2002: A regional plant near Aledo with a capacity to pump two million gallons a day (MGD) would be constructed along with a 36-inch transportation line from Lake Benbrook to the Aledo plant. Distribution lines to Aledo, Willow Park and Hudson Oaks would be installed.
- Year 2012: The regional plant would be expanded to add four MGD capacity (for a total capacity of six MGD). Transportation lines would be extended to Annetta and Annetta South.
- Year 2020: The regional plant would be expanded to add six MGD capacity (for a total capacity of 12 MGD). Transportation lines would be extended to Annetta North and the Bluebonnet Hills area (Hwy 377). Transportation lines to Aledo, Willow Park and Hudson Oaks would be upgraded.
- Year 2030: The regional plant would be expanded to add six

MGD (for a total capacity of 18 MGD). Transportation lines to Aledo and Annetta would be upgraded. Transportation lines would be extended to south and north Fort Worth fringe areas.

Area cities would not abandon use of the well systems immediately, but would phase them out as the surface water system came on line, Carta said.

Area cities will have to keep drilling wells until a regional plant gets on line no sooner than 2002. However, once the plant goes on line, cities shouldn't have to drill any more wells, he said.

The Community NEWS

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August 13, 1998

Rain Dance



The Community News - Christopher Amos

Last week's showers brought a temporary break in the drought, and felt so good they inspired Deer Creek residents Adam Estill and brothers Price and Parker Taggart to dance in the rain. Many adults felt the same way but suppressed the urge.

The Community NEWS

Serving Eastern Parker County: Aledo ★ the Annettas ★ Hudson Oaks ★ Willow Park

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August 13, 1998

Group recommends surface water to meet future needs

by Robyn Adams Schmidt

How should southeastern Parker County residents get their water in the 21st century? Probably not from wells, but from a surface water source, such as Lake Benbrook.

That's the preliminary finding of the water study being conducted by the engineering firm, Teague Nail and Perkins, Inc. (TNP), a civil engineering firm in Fort Worth. TNP engineers presented their findings to a full house at Willow Park City Hall August 4 and asked cities to give them feedback on the study so far.

At this point, TNP is recommending that southeastern Parker County cities purchase raw surface water and process it at a regional water plant that would be ideally situated on a hill north of Aledo.

A little more than half complete, the study is examining ways to provide the water needs for the area through 2030. The study was commissioned by the Parker County Utility District Number 1 this spring at the request of the cities of Willow Park, Aledo, Hudson Oaks and Parker County. The sponsors' funding was matched by a grant from the Texas Water Development Board to make the study possible.

The part of Parker County being studied is bounded by White Settlement Road to the north, the county line to the east and south, Hwy 171 to the southwest and Weatherford to the west. The study includes the cities of Willow Park, Hudson Oaks, Aledo, Annetta North, Annetta and Annetta South and unincorporated areas.

The engineering firm plans to have the study complete by late fall. The meeting last week was the second of three public meetings intended to keep residents informed of the study's progress. A third meeting is planned tentatively for October when the engineering firm will be putting the finishing touches on the study, said Kelly Carta, one of two engineers heading up the study. The other engineer, Kelly Dillard, also spoke at the meeting.

Carta explained that the firm is estimating the needs for the area through 2030 by projecting area growth using census data and estimates by cities and the North Texas Council of Governments. For purposes of the study, Carta said, they are assuming cities will increase their city limits by 10 percent annually.

The firm made this aggressive assumption to protect against underestimating growth. Ten percent annual growth would have all the cities in the area overlapping and meeting the city limits of both Weatherford and Fort Worth by 2030, Carta said.

"It's getting harder and harder to keep up by punching wells in the ground,"

Kelly Carta

Along with estimating area growth by 2030, so far the engineers have evaluated the existing well supplies and possible alternative water sources. Currently, all the residents in the study area get their fresh water from well sources. To keep up with the estimated population growth, Carta said, 276 more wells would need to be drilled by 2030, with each well impacting 18 acres of land each.

Along with the significant land requirements, the increase in costs to drill deeper wells and the likelihood of future groundwater contamination makes well usage a non-viable long term solution to meeting the regional water demand.

"It's getting harder and harder to keep up by punching wells in the ground," Carta said.

The second option for providing water to the area is to purchase treated surface water from an entity in the area, Carta said. However, at this time, there is no treated water currently available to purchase, he said, because the two neighboring entities who treat their own surface water - Fort Worth and Weatherford

- are not willing or able to sell their treated water, he said.

Fort Worth has informed his firm, Carta said, that the city has its hands full providing water to its current customers and is not interested in serving areas of Parker County outside of its extra-territorial jurisdiction (ETJ) at this time.

Weatherford currently does not have an adequate water supply - from Lake Weatherford - which would allow them to serve the study area, Carta said. And Weatherford's contract with the Tarrant Regional Water District (TRWD) to purchase water out of Lake Benbrook prevents them from wholesaling water purchased from TRWD.

The final - and best - option is for area cities to purchase raw surface water and treat it themselves, Carta said. According to state law, the available raw water supplies for the study area are all controlled by the TRWD. The TRWD controls Lake Benbrook, a constant level lake and the ideal site for the study area to obtain raw water, he said.

In order to take advantage of this option, Carta said, the area cities would have to decide on how to purchase the raw water, transport it, treat it and then distribute it to each of the area water providers.

Based on past experience, Carta said, his firm is recommending that the area cities work with a large regional entity, such as the Parker County Utility District #1 or TRWD to acquire these services. The firm has already contacted the TRWD, which has expressed an interest in contracting with area entities to sell raw water.

Related article page A4:

Site north of Aledo recommended for regional water plant

Background:

Background information on the water study process can be found at

www.community-news.com

Still on tap: Water rationing set until Aug. 20

Water rationing will continue in Springtown until at least the August 20 regular city council meeting.

At that time, the council will decide whether or not to continue odd-even rationing.

The council recently passed Ordinance 189, giving the council and Mayor Thomas Gentry the power to regulate the water situation, now and in the future.

A person's address and the date of the month determines whether a lawn can be watered in Springtown.

Folks with addresses ending in an odd number, such as 431, will be able to water their lawns on dates on odd numbered days of the month, such as Aug. 3.

Those with even numbered addresses, such as 432, can water on even numbered dates, such as Aug. 4.

However, folks with odd numbered addresses may not water on two consecutive days, such as Aug. 31 and Sept. 1.

Water rationing pertains only to gardening, watering yards or washing cars. Local businesses are also included.

The city is currently operating within the capacity of the water treatment plant. However, as the heat has continued, the city's water usage has also steadily increased. Recently, water usage peaked at 500,000 gallons per day. The city would like to keep it at between 350,000 and 400,000 gallons per day.

Springtown police officers are issuing warnings for water customers who do not observe odd-even water rationing. A second offense could meet with a citation and a fine not to exceed \$2,000.

Cindy Hall, interim city administrator, said she has already been receiving a lot of phone calls regarding the water rationing.

If rationing is not successful, outside watering could be prohibited for entire weekend periods — from noon Friday until noon Monday.



Coach Jerrell Rutherford puts a pair of Porcupines through their drills during the first week in pads at Springtown High School. The Porkys are preseason favorites to win the district 8-4A championships.

Doslich eyes 2 goals

by Shelly Pope
The Springtown Epigraph

As the days dwindle and summer comes to an end, teachers and principals are already in the classrooms working on the coming school year.

Springtown High School Principal John Doslich is beginning his second year as principal and looks forward to a wonderful year.

"We hope to improve in two specific areas," Doslich said. "We plan to put a heavy emphasis on improving attendance and our various test scores like the TAAS and end of course exams."

In its effort to put these areas under the microscope, the faculty plans to identify truant students faster and improve parental contact.

He said the district will work hard and to improve student attendance.

"Last year we had a 92.5 percent

attendance rate," Doslich said. "We need to get it up to at least 94 percent."

Along with these goals, the school has hired 12 new teachers and opened three new positions this year, including Spanish, Chemistry and Speech.

Many changes will come with the new year. One of those changes will be a new start time for the school day. The day will begin at 8:30 a.m. and end at 3:35 p.m. Last year, the school day began at 8 a.m.

"This will leave the time from 8 to 8:30 for tutoring," Doslich said. "We feel that a morning tutoring time will be more advantageous than the former afternoon time."

More kids will be tempted to attend in the morning rather than after school, he said.

"We scored the highest ever in reading and math last year on the TAAS," Doslich said. "But we still



Springtown High School Principal John Doslich.

need to improve in these areas." The school had a rating of 72 percent in the math portion of

PLEASE SEE GOAL, PAGE 2

Treadwell, ISD growing together

by Edwina Newton
The Springtown Epigraph

Lloyd Treadwell remembers his first interview with the Springtown school board back in 1992.

Treadwell and the board talked about students, academics, philosophy — for over four hours.

"Before we knew it, it was 10:30 (p.m.)," Treadwell said. "Time just flew by."

That interview played a key role in Treadwell's decision to serve the board as its next superintendent. Through both academic and aesthetic changes, its relationship that seems to have grown

stronger through the years.

"Without a supportive school board, there's no way we could meet the goals we have," Treadwell said.

The Springtown Independent School District faces a number of challenges as it heads into the next century.

Academically, Treadwell has been assigned the task of improving district-wide test scores on the Texas Assessment of Academic Skills (TAAS) tests. The state-mandated testing is required for graduation.

When Treadwell took over in 1992, TAAS scores were nothing to write home about.

"The board's first priority was to improve academic performance," Treadwell said. "Everyone was working hard, but working hard doing the wrong thing."

After a time of readjustment, teachers began refocusing on math (problem solving), reading and



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THURSDAY
August 13, 1998

50 cents
16 pages, 1 sections

H.O. utility board: Scrap excessive water use rates

By ROGER M. ELLIOTT
Democrat Reporter

HUDSON OAKS — Tuesday night the Hudson Oaks Utility Board met for their regular August session to consider, among other items, their recommendations to the city council regarding the distinct, but related issues of water rationing and excessive use rates.

The utility board, two members short, unanimously approved three motions:

•To recommend to the city council that they "scrap the plan" to implement excessive water usage rates.

•To recommend to the city council that they appoint a panel, large-

ly of citizens and to include the Public Works Manager, to determine the cost and feasibility of giving the citizens of Hudson Oaks all the water for which they are willing to pay, plus some cushion for emergency use and fire suppression. This would be done with an eye toward putting the determined numbers to the voters as a bond issue.

•To recommend to the city council that they modify the water restrictions to allow one hand-held hose with automatic shut-off without time or day restrictions for watering shrubs, potted plants, foundations, etc. They also recommended looking at varying the

hours and length of time per day to water. They further recommended considering a system for variances from the water rationing in the form of permits to be posted in plain view, in the vain of building permits.

At their last regular meeting, the city council delegated some authority to the mayor, the city administrator, or the public works manager. This delegation is triggered in the event of "deficient water pressure or deficient water reserve...or emergency caused by a shortage of water." At that point any one of these three may "institute any water rationing plan adopted and approved" by the

council. This delegation recognized the potential need to act between monthly council meetings.

The citizens asked for variances from the utility board and received endorsements for some which were included in the board's motions.

To avoid confusion, Donny Cole, Public Works Manager for the city, says that nothing has changed until citizens receive a notice from the public works department. Cole will continue to issue citations for violations under the current water rationing plan.

Cole, who has been in his posi-

See Water, page 2

Water

Continued from page 1

tion since March 1998, said that as he considers any "requests" for modifications, he must consider how the state will view these plans.

"If we don't have a plan that includes a graduated rate schedule for excessive water use, we jeopardize our chances to get grant monies or low-interest loans from the Texas Water Development Board to improve the system," Cole said. The utility board did not

consider the recommendation of the city council, authored by Councilmember Meyer, to consider defining excessive use over a 13-month average as 50,000 gallons per month and using this policy only during the summer months.

The meeting was chaired by Bobbye Roberts. Also present to form a quorum were board members Pat Dean and Jim Jones. The city secretary Sheila Elmore took the minutes.

TODAY: HUDSON OAKS DEADLOCKS ON MOBILE HOME SALE

The Weatherford

DEMOCRAT

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No. 214

THURSDAY
September 10, 1998

DAILY WATCH

WEATHER (AP) — Tonight and Friday, variable cloudiness. A 40 percent chance of showers or thunderstorms Friday. Low near 70. High in the upper 80s. southeast to east wind 5-15 mph. Extended forecast, Friday night, partly cloudy with a low in the upper 60s. Saturday through Monday, partly cloudy with a chance of showers and thunderstorms. Lows around 70. Highs in the lower 90s.

TYLER, Texas (AP) — A retired Texas Alcoholic Beverage Commission agent has been shot and killed during a violent confrontation with a businesswoman, police say. Former TABC agent Gordon Anders was shot Tuesday night by Doris Hardy's 39-year-old son, Steve Hardy, police said. Mrs. Hardy, 63, suffered head injuries and broken fingers when she was pistol-whipped by Anders, said police Capt. Greg Grigg.

"It was a mess but it would have been a bigger mess if her son had not shown up (at the house)," Grigg told the Tyler Morning Telegraph.

Ms. Hardy, who owns Hi-Way Wrecker service and the Apache Drive-Thru Theater, was released Wednesday from East Texas Medical Center.

Utility rates increase in Oct

Weatherford City Council sets property tax rate at

HO board defines excessive water use

By ROGER M. ELLIOTT
Democrat Reporter

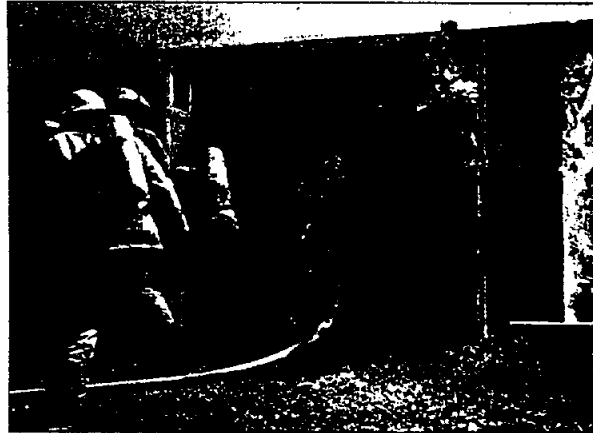
HUDSON OAKS — Tuesday night the Hudson Oaks utility board recommended that "excessive water use" be defined as an average use of more than 50,000 gallons per month, in a 13-month period. This recommendation will be considered at the next regular city council meeting on Monday, Sep. 28.

The city council had directed the utility board to create this definition with the stated intention of charging users a higher rate for water use above that level during phase one water rationing.

Vice chair Bobby Roberts presided over the board meeting. The city council accepted the resignation of former chairman Gene McGee last month. After Elliott

See Excessive, page 5

Quick response saves homestead



Weatherford Fire Department personnel responded quickly Sept. 8 to a fire at 2112. The fire, which ignited a few minutes before noon, was contained and extinguished by firefighters. The fire, which ignited a few minutes before noon, was contained and extinguished by firefighters. The fire, which ignited a few minutes before noon, was contained and extinguished by firefighters.

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Excessive

Continued from page 1

ing a quorum, Roberts declared that the only business on the agenda was setting this definition, and that the purpose of defining excessive water use was to help deter excessive use.

Board member Pat Dean spoke up to take exception with the agenda item itself.

"I will not support any kind of rate increase while water rationing is working," said Dean.

Dean said that he had voted with the rest of the board to recommend dispensing with a rate increase altogether in the light of a high compliance with water rationing, which has brought the water delivery and storage system back from its earlier danger points.

Citizens in attendance, numbering about 20, tried to ask questions and make statements, but were told by the chair that "This is a closed meeting. This is not an open meeting and we won't be

hearing from anyone in the audience this evening."

Scott Larson, in the audience asked why the meeting had not been posted as a closed meeting. Roberts consulted with city secretary Sheila Elmore and amended her statement that the meeting had been posted as an open meeting, but restated that the only voices in order would come from the dais.

The president had been set, at least last month, for a very permissive format of interaction between the dais and the audience. Two out of three of the resulting recommendations of that night were rejected by the council including the recommendation to scrap the consideration of a graduated rate schedule. When rejecting this recommendation, the council remanded the issue to the board with instructions to try again.

Dean reminded the board that they had recommended that the city council appoint a citizens

board to study how to meet the water demands of the city without any form of rationing or rate hikes. Dean said that although the council had rejected such a panel, he had met with interested citizens and wanted to discuss this.

Roberts requested a motion to define excessive water use as use beyond a 13-month average of 50,000 gallons per month.

Board member Jim Turner so moved and Roberts seconded. The votes were called and only Dean dissented. The vote was called and passed 2-1.

Roberts then requested a motion to adjourn. Turner so moved, and Roberts seconded. The votes were called and only Dean dissented. The board adjourned on the 2-1 vote.

While the board existed, residents discussed among themselves what their next action would be.

The Democrat will continue to cover these issues in the utility board and the city council.

The Weatherford

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No. 265

TUESDAY
November 10, 1998

50 cents
10 pages, 1 sections

Tip exposes hazardous waste site

Years of oil, batteries, filters dumped into water well causes untold damage



By ROGER M. ELLIOTT
Democrat Reporter

WEATHERFORD — Although no charges have yet been filed, over the past week, based on information from the public safety "tip line," law enforcement personnel went to an automobile repair and service shop in the 500 block of North Main Street, and asked the owner of Young's Auto Center for permission to look around.

The tip said that the business had a service station at the front of the property and used to have a boarding house at the rear of the property. This boarding house used what is believed to be a Paluxy formation water well. The tipster claimed that the current owner has been storing up used motor oil in 55 gallon drums and then emptying them, along with filters, old batteries and other hazardous products, into the water well.

This practice was claimed to have been conducted for at least seven, and possibly 20 or more

years.

After giving permission for the inspection, the owner showed officials the water well, which authorities said was visually contaminated with fossil fuel and other hazardous products.

The air thick with a pungent oil field smell, investigators probed the well with a pole and determined that the shaft contained oil at least 30 feet down, this being the length of the pole. Having determined that the site was hazardous, at noon yesterday, law enforcement officers executed an evidentiary warrant signed by County out-at-Law Judge Graham Quisenberry.

Based on hydrocarbon emissions, fumes, and standard operating procedure, officials from the Texas Natural Resources Conservation Commission (TNRCC) declared the area a hazard and alerted the Hazardous Materials Response Team.

See OIL, page 3

Oil

Continued from page 1

According to Larry Dorman, environmental investigator for the Office of the County Attorney, one of the primary missions of law enforcement after serving the evidentiary warrant, as they were working late into the night, is to stabilize the site in the interest of public safety.

Dorman reports having hit a debris clot several feet down that, when removed, released a large amount of methane gas that had built up.

"That could be an explosive hazard," said Dorman.

Agencies currently involved in

the cooperative public safety effort include the Weatherford Police Department, Weatherford Fire Department, Parker County Sheriff's Office, TNRCC, City of Weatherford Public Works, County Attorney's Office, Office of the District Attorney, and Eagle Environmental Services, who last night was pulling contaminated soil, filters, hoses, and other sundry parts, and pumping oil from the water well.

As the crews worked, the gravity of the situation was highlighted by a workman.

"Any kid who fell in that, wouldn't stand a chance."

APPENDIX H - CASE STUDY - WATER RATIONING IN STUDY AREA

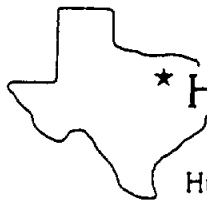
Hudson Oaks Rationing Notice

Hudson Oaks Proposed Conservation Rates

Hudson Oaks Citizens Response

Comment

Willow Parks New Conservation Rates



City of
HUDSON OAKS

150 N. Oakridge Drive
Hudson Oaks, Texas 76087

(817) 596-4899 • FAX (817) 596-8829

July 13, 1998

TO: CITY OF HUDSON OAKS WATER CUSTOMERS

RE: MANDATORY STAGE I WATER RATIONING

Due to extreme water usage during the past weeks, our water system has not been able to meet the demand of all water needs. Therefore, the City of Hudson Oaks is implementing Stage I - Mild Rationing.

Stage I rationing will begin on Thursday, July 16, 1998 at 10:00 p.m. and will remain in effect until September 30, 1998 or until further action is deemed necessary.

Under Stage I rationing usage of water for outdoor purposes such as lawns, gardens, car washing, etc. will be restricted to alternate day use and hours.

Customers with even numbered addresses can water outdoors on Monday, Wednesday and Friday between the hours of 8:00 a.m. to 10:00 a.m. and 8:00 p.m. to 10:00 p.m.

Customers with odd numbered addresses can water outdoors on Tuesday, Thursday and Saturday between the hours of 8:00 a.m. to 10:00 a.m. and 8:00 p.m. to 10:00 p.m.

NO OUTDOOR WATERING ON SUNDAY IS ALLOWED.

Penalties for violation of Stage I Rationing are as follows:

First Violation

Customer will be notified by written notice of their specific violation.

Second Violation

City may install a flow restricter in the line to limit the amount of water which will pass through the meter in a 24-hour period. The cost to be charged to the customer's account for the flow restricter will be the actual installed cost to the City.

Third and Subsequent Violation

City may terminate service at the meter for a period of seven (7) days, or until the end of the calendar month, whichever is LESS. The normal reconnect fee of the City will apply for restoration of service.

Water usage will be monitored by City personnel. We strongly urge your cooperation by limiting your water usage whenever possible.

City of Hudson Oaks
Water Department

AN ORDINANCE SETTING WATER RATES WITHIN AND OUTSIDE THE CORPORATE CITY LIMITS OF THE CITY OF HUDSON OAKS, TEXAS; PROVIDING FOR A DUE DATE; PROVIDING FOR LATE PAYMENT CHARGES; PROVIDING FOR DISCONNECTION OF SERVICE; PROVIDING FOR DISCONNECTION FEES; PROVIDING FOR RECONNECTION FEES; PROVIDING FOR RETURNED CHECK FEES; PROVIDING FOR RECONNECTION FEE AFTER TAMPERING AND PROVIDING FOR CUMULATIVE REMEDIES; PROVIDING FOR INSTALLATION CHARGES FOR METERS; PROVIDING FOR COLLECTION FEES; PROVIDING FOR TRANSFER OF ACCOUNTS; PROVIDING FOR REPEAL OF ORDINANCES IN CONFLICT; PROVIDING FOR A SEVERABILITY CLAUSE; AND PROVIDING FOR AN EFFECTIVE DATE.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF HUDSON OAKS, TEXAS:

I.

That from and after the effective date hereof, the rates for water services provided by the City of Hudson Oaks, Texas, shall be as follows:

WATER RATES WITHIN AND OUTSIDE THE CORPORATE CITY LIMITS

A minimum monthly service charge shall be made each month or fraction thereof for water service. The minimum charge shall be based on the size of the meter.

<u>METER SIZE</u>	<u>MINIMUM CHARGES</u>
3/4 inch	\$20.00
1 inch	\$33.00
1 1/2 inch	\$66.00
2 inch	\$113.00

The rates charged for the use of water by residential customers shall be calculated by use of the following rate scales:

<u>USAGE CHARGES</u> <u>GALLONS</u>	<u>MONTHLY RATES</u>
First 2000 gallons or less	Minimum charge according to meter size.
In excess of 2000 gallons	\$1.80 per thousand gallons.

II.

All water accounts shall be due upon receipt. Statements shall be mailed on or about the 25th day of each month and shall be past due after the 10th day of the following month.

III.

All accounts paid after the 10th day of each month shall include a 10% late penalty charge.

IV.

Accounts not paid before the seventh (7th) day following the deposit of a "Final Notice" with the United States Postal Service with postage prepaid to the address shown on the records of the City of Hudson Oaks, Texas, shall be subject to having water services discontinued. A service charge of \$20.00 shall be made for collection of a water bill at the service location.

V.

A \$40.00 reconnection fee shall be made for reconnections made of services discontinued for reasons of non-payment made during normal working hours.

VI.

Should any check for the payment of water services as hereinabove set out be returned by the bank upon which it is drawn, for any reason, then in such event, a \$15.00 returned check fee shall be assessed the customer for whose account such returned check was applied. All sums received after assessment of the returned check fee will be applied first to the returned check fee and then to other charges due on such account.

VII.

A fee of \$100.00 plus costs incurred by the City for the repair or replacement of its equipment shall be made for the reconnection of any meter which has been removed because of illegal tampering. This fee is cumulative of all other remedies of the City, including the filing of criminal charges for tampering.

VIII.

Service charges for the installation of meters shall be as follows:

<u>SIZE OF METER</u>	<u>FEES</u>
3/4 inch	\$40.00
All other sizes	Cost of meter plus 20% thereof.

IX.

No water service accounts are transferrable without the written consent of the City and the payment of a \$40.00 transfer fee.

X.

This Ordinance shall repeal all other ordinances or portions thereof in conflict herewith, but only to such extent that the same shall be in conflict herewith.


XI.

In the event that any section, paragraph, sentence or clause shall be held to be inoperative, illegal or unconstitutional, the same shall not invalidate the remainder hereof.

XII.

This Ordinance shall be effective from and after its passage and approval.

PASSED AND APPROVED this 24th day of August, 1992.



MAYOR

ATTEST:



CITY SECRETARY

PROPOSED WATER RATE SCHEDULE FOR EXCESSIVE USE

PROPOSED RATE STRUCTURE (EXCESSIVE USE)	GALLONS USED	GALLONS USED	GALLONS USED	GALLONS USED	GALLONS USED	GALLONS USED
	50,000	70,000	90,000	110,000	130,000	150,000
COST BASED ON 3/4" METER						
WATER RATE - SCHEDULE NOW IN EFFECT						
\$20.00 FIRST 2,000 GALLONS	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00
\$ 1.80 OVER 2,000 GALLONS	\$ 86.40	\$ 122.40	\$ 158.40	\$ 194.40	\$ 230.40	\$ 266.40
TOTAL AMOUNT BILLED (OLD RATES)	\$ 106.40	\$ 142.40	\$ 178.40	\$ 214.40	\$ 250.40	\$ 286.40
WATER RATE - PROPOSED RATE SCHEDULE						
\$20.00 FIRST 2,000 GALLONS	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00	\$ 20.00
\$ 1.80 2,000 TO 50,000 GALLONS	\$ 86.40	\$ 86.40	\$ 86.40	\$ 86.40	\$ 86.40	\$ 86.40
\$ 3.60 50,001 GALLONS AND OVER	\$	\$ 72.00	\$ 144.00	\$ 216.00	\$ 288.00	\$ 360.00
TOTAL AMOUNT BILLED (NEW RATES)	\$ 106.40	\$ 178.40	\$ 250.40	\$ 322.40	\$ 394.40	\$ 466.40
DIFFERENCE BETWEEN NEW RATE AND OLD RATE						
	\$ -	\$ 36.00	\$ 72.00	\$ 108.00	\$ 144.00	\$ 180.00

(CONTINUED)								
CUSTOMERS FALLING IN CATEGORY OF EXCESSIVE								
(WATER USAGE FROM MAY 15 TO JUNE 15 & BILLED ON JUNE 26, 1998 - 669 CUSTOMERS)	625 (93.42%)	27 (4.04%)	12 (1.79%)	3 (.45%)	2 (.3%)	0		
*COMMERCIALS INCLUDED		(INCLUDES 1)	(INCLUDES 2)	(INCLUDES 1)				
(USING A 13 MONTH AVERAGE FROM ACTUAL BILLINGS USING JULY 15, 1998 AS 13TH MONTH)								
666 CUSTOMERS BILLED	657 (98.65%)	7 (1.05%)	1 (.15%)	1 (.15%)	0	0		
*COMMERCIALS INCLUDED		(INCLUDES 1)	(INCLUDES 1)	(INCLUDES 1)				

The Hudson Oaks Concerned Citizens Committee

Se

Dear Neighbors,

We have sent this packet of information to you because we want you to be aware of the effort we have made for the past four months to change the City of Hudson Oaks long term position on our water delivery system. "We want the system to fit the citizens needs, not the needs to fit the systems capacity".

Our city administration is currently planning to avoid investing money in our system (which we out grew long ago) by controlling the amount of water we use by **doubling the cost of water** over an arbitrary amount to be set at the next council meeting.

The meeting is Monday September 28th at 7:30 PM at the Hudson Oaks City Offices.

We ask you to please come and see for yourselves how our water problem is handled by this administration. Attitude is everything and you need to see it first hand.

Your quality of life and your investment in your property are in the balance.

- We are not running out of water in the aquifer. We just don't have the proper number of wells and supporting equipment to meet the demand.
- While rationing in extreme situations maybe necessary, Excess charges and lack of concern for our convenience and investment are not.
- The time has come for a plan from our city to solve the problem.
- You need to know the details of the proposed sewer project in our Business district and how it effects you and your money.
- You need to know what is more of a priority the water problem or the sewer problem.

For sever months we have attempted to eliminate the excess water rate plan to no avail. With your attendance and an understanding of the facts we hope to get the administration to take an approach to solving both the sewer and water problems at the same time and refrain form jeopardizing our cities reputation and property values In the process.

We thank you for your time,

The Hudson Oaks Concerned Citizens Committee,

Jim Paxton
Beth Bowen
John Wigley
Steve Houlihan

Tom Hackleman
Jim Jones
Candy Grantham

HUDSON OAKS WATER SYSTEM USERS PERSPECTIVE
(prepared by a committee of Hudson Oaks water system users)
September 6, 1998

PURPOSE

To communicate to the City of Hudson Oaks (mayor, city council, city staff, utility board) a perspective and proposed recommendations for improving the capacity of its present water system to meet the needs of the customers it serves.

CHRONOLOGY OF EVENTS

1. The city council proposed a permanent increase to water rates for all customers based on excessive usage
2. The city council approved a motion by council member Meyer to send the above proposal back to the utility board to assess the effectiveness of phase 1 water rationing in conjunction with determining an excessive use value over which water rates would be permanently raised. Fifty thousand gallons per month was suggested as a value to be considered.
3. The utility board determined, based on a study by the city's water system manager (Donny Cole) and on inputs from residents that water rationing was effective at controlling water usage and maintaining acceptable levels for the current water system.
4. The utility board approved a motion by board member Deen, based primarily on the effectiveness of water rationing to not increase water rates to control excessive usage.
5. The city council initially approved the utility board's recommendation to not increase water rates on the basis of excessive use.
6. The city council subsequently approved a motion from council member Molenburg to have the utility board recommend an excess usage number above which water rates could be permanently raised.

BACKGROUND

- Gardening and irrigation experts recommend a minimum of one inch of water per week be applied to grass, shrubs and trees which equals 116,762 gallons per acre per month *108,617 gal/ac/mo*
- Household water usage can vary from 3,000 gallons to 12,000 gallons per month for an average family of four.
- Water usage for maintaining swimming pools and hot tubs can be estimated to be from 3,000 gallons to 12,000 gallons per month.
- Based on the above, an average household requires an average of 15,000 gallons of water per month or 500 gallons per day for household/swimming pool/hot tub use.

- Assuming a minimum of 3/4 acre is required to meet state/county/city requirements for septic systems in Hudson Oaks, it can also be assumed that the minimum acreage per water customer is 3/4 acre.
- 3/4 acre lots require a minimum of 87,572 gallons of water per month or 2,919 gallons per day for grass, trees and shrubs.
- Based on the above, each Hudson Oaks water customer requires 102,572 gallons of water per month or 3,419 gallons per day.
- Hudson Oaks has approximately 666 customers for water, the majority of which are average households.
- Based on the above, the 666 customers on the Hudson Oaks water system require, at a minimum a total of 2,277,054 gallons of water per day.
- The Hudson Oaks water system (Hidden Oaks, Diamond Oaks, Hudson Heights, Lakeshore) currently has a total of 1,146,800 gallons available per day.
- Based on the above, the Hudson Oaks water system falls short of meeting its customers' minimum per day requirement by 1,130,254 gallons. The system can only meet 50% of customer needs during peak usage months (June through August).

ISSUES / CONCERNS

1. City council members continue to press for a permanent increase to water rates for excess usage despite recommendations and approved motions by the utility board and the city council itself not to.
2. Objective evidence exists to support the claim that water rationing is working given the current water system's limitations for meeting customer needs. Motions continue to be made and approved by city council to establish a value for excess water usage to apply permanent water rate increases to.
3. Based on objective evidence from gardening and irrigation experts, it appears that the Hudson Oaks water system falls significantly below (100%) the level necessary to meet requirements established by these experts to meet minimum irrigation requirements.
4. It appears that a master plan for developing / improving the Hudson Oaks water system to meet the current and future needs of its customers doesn't exist and /or is not budgeted.
5. The customers of the Hudson Oaks water system have been rationed for four of the last six years with talk of extending the rationing period from April through September in 1999.
6. The customers of the Hudson Oaks water system have great concern over their loss of landscape (lawn, trees, plants and shrubs) and have had no feedback from the city that a plan is in place to prevent future losses.
7. It appears that city council and city administration have set a priority for establishing a sewage system for the business district above that of improving the water system for its customers. It is not clear to the residents of Hudson Oaks if sewers for the businesses will be paid for by the businesses, revenues generated from water usage, a bond election or some combination there of.

8. There is a concern on the part of water customers that proposed water rate increases (double) for excess usage would not be earmarked for expanding the water system to meet current and future needs.
9. There is a perception by water customers that the city and the utility board plan to make customer needs fit the current system.
10. There will be a world wide water shortage in the future. It is being addressed, as it should be, by the State of Texas, and local water districts. It is not imminent and should not be confused as having anything to do with our current problem, which is water delivery.
11. State minimum requirements have no relevance to serving the needs of the customers.
12. Proposing excess water usage rates and publicly addressing city water system short falls is already having a negative effect on public perception and will ultimately reduce property values for the residents of Hudson Oaks and water system customers.

RECOMMENDATIONS

1. Recommend again to city council that they rescind the dual level price for excess water usage and allow rationing control water usage as other cities do.
2. Establish a plan to upgrade the city's current water system (additional wells, storage, pumps ...) in phases. The first phase would be completed by May of 1999 and would increase the current system's capacity by 50%. The second phase would be completed by May of 2000 and increase the current system by an additional 50%. The upgraded system is targeted at meeting customer needs and enhancing the city as a whole in appearance and perception.
 - a) The plan must be based on reasonable usage by water customers, recommendations from those same customers, professionals and experts in the field as well as the city's / customers ability to pay.
 - b) The plan should initially consider doubling the current water system's amount of available water. It is important that the plan take into consideration the fact that water customer needs have changed significantly since the system was originally designed. The majority of customers tied to the system in the last ten years have greater needs and expectations for their household, landscape, swimming pools etc.
 - c) The plan should consider provisions for upgrading all users to one inch meters.
 - d) The plan should be given the highest priority by the mayor, the city council, the city staff and the utility board.
3. Have the mayor and city council address all of the aforementioned issues / concerns in an open meeting to allay fears and misperceptions.

- Father, son enjoy Aledo success B2 • Bearcat Express keeps rolling B1, B4-S • Aledo 4th graders share Thanksgiving
- Willow Park Fire Department working to get back in budget A4 • Atlas shown at Middle School A8 • Band members make
- New JP has battle experience A6 • Local students collect 14,900 cans of food A7 • Aledo Christian School makes
Week All in Parker County's only locally owned newspaper.

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ie Community news

Eastern Parker County: Aledo ★ the Annettas ★ Hudson Oaks ★ Willow Park

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<http://www.community-news.com>

November 26, 1998

Willow Park adopts new water rates

by Margaret Wintersole

Willow Park residents will see new and more complicated water use charges go into effect soon.

Currently the city charges a flat residential rate of \$1.85 per 1000 gallons and \$2.75 outside the city.

After a motion by Councilman Gene Martin, the Willow Park City Council unanimously approved a new, graduated water rate schedule for residential users at its regular meeting November 17.

Mayor Les Cooley told those attending the meeting that the state recommended a graduated rate scale as a conservation measure.

"We're going to shortly be going to the state for assistance for water. If we can't show that we're doing something, then they're not going to do anything."

Area cities are presently studying surface water supplies for future use as more stress is put on ground water sources by rapid growth in east Parker County.

The following rates per thousand gallons will apply to residents inside the city limits:

\$1.85 for 0 to 16,000 gallons
\$2.00 for 16,001 to 22,000 gallons
\$2.25 for 22,001 to 30,000
\$2.50 for 30,001 to 40,000
\$2.75 for 40,001 to 50,000
\$3.70 for 50,001 to 75,000
\$5.00 for 75,001 and up

The following rates will apply to customers outside the city limits:

\$2.75 for 0 to 16,000 gallons
\$2.90 for 16,001 to 22,000 gallons
\$3.15 for 22,001 to 30,000
\$3.40 for 30,001 to 40,000
\$3.65 for 40,001 to 50,000
\$4.60 for 50,001 to 75,000
\$5.90 for 75,001 and up

Commercial rates will remain the same. The new residential rates will go into effect after publication of a legal notice by the city.



APPENDIX I - POPULATION HISTORY AND PROJECTIONS

Willow Park Population Data
Hudson Oaks Population Data
Aledo Population Data
Annetta North Population Data
Annetta South Population Data
Annetta Population Data
Fort Worth ETJ North Population Data
Fort Worth ETJ South Population Data
Unincorporated Parker County Population Data
Weatherford Population Data
Willow Park Population Graph
Hudson Oaks Population Graph
Aledo Population Graph
Annetta North Population Graph
Annetta South Population Graph
Annetta Population Graph
Fort Worth ETJ North Population Graph
Fort Worth ETJ South Population Graph
Unincorporated Parker County Population Graph
Weatherford Population Graph
Population by Entity
Population by Pipe
Other Demographics

POPULATION HISTORY AND PROJECTIONS
Willow Park

Year	Census	2.99% COG 98	Self WP Data	TWDB Low	TWDB High	TWDB ML	7.00% COG 15 yr	5.04% COG 8 yr	Region C	Straight Line	
										Projection Str Line	Used In This Study
1970		230									
1980		1,113									
1990	2,328	2,328		2,328	2,328					2,328	
1991	2,444									2,411	
1992	2,512									2,494	
1993	2,570									2,577	
1994	2,644									2,660	
1995	2,751	3,050	2,500							2,744	
1996	2,855		3,000							2,827	
1997		3,350	3,000							2,910	
1998		3,450								2,993	
1999		3,553								3,076	
2000		3,660								3,159	3,042
2005		4,240		2,643	3,665	3,121	4,307	3,807	3,121	3,575	3,145
2010		4,913		2,926	5,393	4,046	6,041	4,867		3,990	3,252
2015		5,693					8,472	6,224	4,046	4,406	4,544
2020		6,597		3,091	7,800	4,981	11,883	7,959		4,821	5,370
2030		8,857		3,177	10,173	5,968	16,667	10,177	4,981	5,652	6,347
2040		11,891		3,207	12,868	6,773	32,786	16,641	5,968	6,483	8,868
2050		15,966		3,237	16,277	7,687	64,494	27,209	6,773	7,314	12,388
							126,870	44,490	7,687		17,307

**POPULATION HISTORY AND PROJECTIONS
Hudson Oaks**

Year	Census	4.17% COG 98	Self HO Data	9.30% COG 15 yr	7.31% COG 8 yr	Straight Line		Used In This Study
						Projection Str Line	Projection Str Line	
1970								
1980		309	300	300				
1990	711	711	711	730	711	711	711	
1991	725			798	763	749	749	
1992	738			872	819	786	786	
1993	752			953	879	824	824	
1994	803			1,042	943	862	862	
1995	861	1,150	1,150	1,139	1,012	899	899	
1996	950		1,200	1,245	1,086	937	937	
1997		1,200	1,200	1,360	1,165	975	975	
1998		1,250	1,250	1,487	1,250	1,012	1,012	1,250
1999		1,302	1,415	1,625	1,342	1,050	1,050	1,342
2000		1,356	1,581	1,776	1,440	1,087	1,087	1,440
2005		1,664	2,410	2,771	2,049	1,276	1,276	2,049
2010		2,041	3,235	4,322	2,915	1,464	1,464	2,915
2015		2,504	4,060	6,743	4,148	1,652	1,652	4,148
2020		3,071	4,885	10,518	5,903	1,840	1,840	5,903
2030		4,621	6,535	25,593	11,953	2,217	2,217	10,394
2040		6,952		62,277	24,204	2,593	2,593	10,394
2050		10,460		151,542	49,010	2,970	2,970	10,394

POPULATION HISTORY AND PROJECTIONS
Aledo

Year	Census	7.41% COG 98	Self Aledo Data	TWDB Low	TWDB High	TWDB ML	3.00% COG 25 yr	2.73% COG 8 yr	Region C	Straight Line	
										Projection Str Line	Used In This Study
1970	620	620					620				
1980	1,027	1,027					833				
1990	1,169	1,169		1,169	1,169	1,169	1,120	1,169		1,169	
1991	1,193						1,153	1,201		1,196	
1992	1,214						1,188	1,234		1,223	
1993	1,238						1,224	1,267		1,250	
1994	1,279						1,260	1,302		1,276	
1995	1,348	1,200	1,300				1,298	1,338		1,303	
1996	1,432		1,350				1,337	1,374		1,330	
1997		1,350	1,400				1,377	1,412		1,357	
1998		1,450	1,500				1,419	1,450		1,384	
1999		1,557					1,461	1,490		1,411	
2000		1,673				1,944	1,505	1,530	1,944	1,438	
2005		2,392				2,393	1,745	1,751		1,572	
2010		3,419					2,022	2,003	2,393	1,706	
2015		4,888					2,345	2,292		1,841	
2020		6,988		4,470	4,470	2,855	2,718	2,623	2,855	1,975	
2030		14,283		5,719	5,719	3,355	3,653	3,433	3,355	2,243	
2040		29,192		7,148	7,148	3,762	4,909	4,494	3,762	2,512	
2050		59,663		8,934	8,934	4,218	6,597	5,884	4,218	2,781	
											1,527
											1,579
											1,633
											1,930
											2,282
											2,697
											3,187
											4,453
											5,173
											5,173

Scenario 1

POPULATION HISTORY AND PROJECTIONS
Annetta North

(Rates based on Unincorporated County)

Year	Census	5.50% COG 98	3.47% COG 8 yr	Straight Line		Used In This Study
				Projection Str Line	Projection Str Line	
1970						
1980						
1990	265		265		265	
1991	271		274		271	
1992	276		284		277	
1993	284		294		284	
1994	289		304		290	
1995	297		314		296	
1996	301		325		302	
1997		303	336		308	
1998			348		314	348
1999		337	360		321	360
2000		356	373		327	373
2005		465	442		358	442
2010		608	524		389	524
2015		794	622		419	622
2020		1,038	737		450	737
2030		1,773	1,037		512	1,037
2040		3,029	1,459		574	1,459
2050		5,174	2,052		636	2,052

Scenario 1

POPULATION HISTORY AND PROJECTIONS

Annetta

(Rates based on Unincorporated County)

Year	Census	5.50% COG 98	3.47% COG 8 Yr	Straight Line Projection Str Line	Used In This Study This Study
1970					
1980					
1990	672		672	672	
1991	692		695	687	
1992	704		719	702	
1993	720		744	717	
1994	736		770	732	
1995	751		797	747	
1996	762		825	762	
1997		769	853	777	
1998			883	792	883
1999		856	913	807	913
2000		903	945	822	945
2005		1,180	1,121	897	1,121
2010		1,542	1,329	972	1,329
2015		2,016	1,577	1,047	1,577
2020		2,635	1,870	1,122	1,870
2030		4,500	2,630	1,272	2,630
2040		7,687	3,699	1,422	3,699
2050		13,131	5,203	1,572	5,203

POPULATION HISTORY AND PROJECTIONS

Annetta South

(Rates based on Unincorporated County)

Year	Census	5.50% COG 98	3.47% COG 8 yr	Straight Line		Used In This Study
				Projection Str Line	Projection Str Line	
1970						
1980						
1990	413		413		413	
1991	423		427		422	
1992	434		442		432	
1993	442		458		441	
1994	453		473		450	
1995	461		490		459	
1996	468		507		469	
1997		472	524		478	556
1998			543		487	575
1999		525	561		497	595
2000		554	581		506	706
2005		724	689		552	837
2010		947	817		599	992
2015		1,237	969		645	1,177
2020		1,617	1,149		692	1,655
2030		2,762	1,616		784	2,328
2040		4,718	2,273		877	3,275
2050		8,060	3,198		970	

**POPULATION HISTORY AND PROJECTIONS
North Fort Worth ETJ Areas within CCN's**

Year	City of Fort Worth				Northern Study Section of Fort Worth ETJ						Used In This Study	
	1.30% COG 98		0.80% COG 25 yr		1.15% COG 8 yr		Based on Water Utility Customers					
	Census	COG 98	COG 25 yr	COG 8 yr	Prorated Census	Prorated COG 98	Prorated COG 25 yr	1.15% COG 8 yr	Straight Line Projection	Str Line		
1970	393,476	393,455	393,455		538	538	538					
1980	385,164	385,164	426,089		527	527	583					
1990	447,619	447,619	461,430	447,619	612	612	631	612	612	612	612	612
1991	457,541		465,121	452,767	626		636	619	619	617	617	617
1992	461,239		468,842	457,973	631		641	626	626	622	622	622
1993	463,970		472,593	463,240	634		646	633	633	628	628	628
1994	468,610		476,374	468,567	641		651	641	641	633	633	633
1995	473,617	473,600	480,185	473,956	648	648	657	648	648	638	638	638
1996	479,716		484,026	479,406	656		662	655	655	643	643	643
1997		484,200	487,898	484,920		662	667	663	663	648	648	648
1998		490,500	491,802	490,496		671	672	671	671	653	653	671
1999		496,871	495,736	496,137		679	678	678	678	659	659	678
2000		503,330	499,702	501,842		688	683	686	686	664	664	686
2005		536,909	520,012	531,370		734	711	727	727	690	690	727
2010		572,727	541,148	562,634		783	740	769	769	715	715	769
2015		610,935	563,143	595,739		835	770	815	815	741	741	815
2020		651,691	586,032	630,790		891	801	862	862	767	767	862
2030		741,543	634,639	707,203		1,014	868	967	967	819	819	967
2040		843,783	687,278	792,872		1,154	940	1,084	1,084	871	871	1,084
2050		960,120	744,282	888,918		1,313	1,018	1,215	1,215	922	922	1,215

POPULATION HISTORY AND PROJECTIONS
South Fort Worth ETJ Areas within CCN's

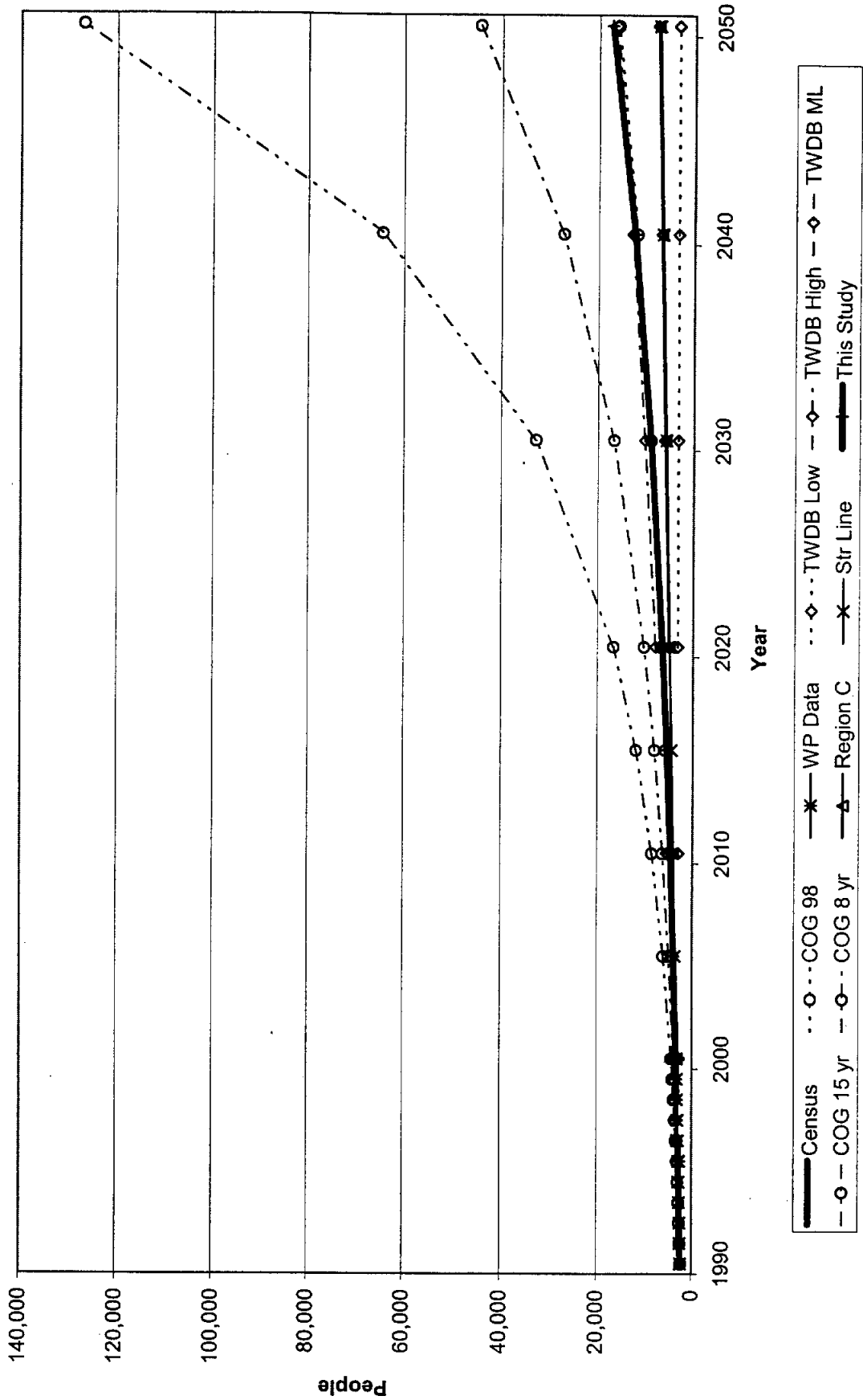
Year	City of Fort Worth										Southern Study Section of Fort Worth ETJ					Used In This Study					
	1.30% COG 98					0.80% COG 25 YR					1.15% COG 8 YR						Based on Water Utility Customers				
	Census	COG 98	COG 25 YR	0.80% COG 8 YR	1.15% COG 8 YR	Census	COG 98	COG 25 YR	0.80% COG 8 YR	1.15% COG 8 YR	Prorated Census	Prorated COG 98	Prorated COG 25 yr	Prorated COG 8 yr	Str Line		Projection	Str Line			
1970	393,476	393,455	393,455			235															
1980	385,164	385,164	426,089			230															
1990	447,619	447,619	461,430	447,619	447,619	267	267	267	267	267	267	267	267	267	267	267	267	267			
1991	457,541		465,121	452,767	452,767	273	273	273	273	273	273	273	273	273	273	273	273	273			
1992	461,239		468,842	457,973	457,973	275	275	275	275	275	275	275	275	275	275	275	275	275			
1993	463,970		472,593	463,240	463,240	277	277	277	277	277	277	277	277	277	277	277	277	277			
1994	468,610		476,374	468,567	468,567	280	280	280	280	280	280	280	280	280	280	280	280	280			
1995	473,617	473,600	480,185	473,956	473,956	283	283	283	283	283	283	283	283	283	283	283	283	283			
1996	479,716		484,026	479,406	479,406	286	286	286	286	286	286	286	286	286	286	286	286	286			
1997		484,200	487,898	484,920	484,920	289	289	289	289	289	289	289	289	289	289	289	289	289			
1998		490,500	491,802	490,496	490,496	293	293	293	293	293	293	293	293	293	293	293	293	293			
1999		496,871	495,736	496,137	496,137	296	296	296	296	296	296	296	296	296	296	296	296	296			
2000		503,330	499,702	501,842	501,842	299	299	299	299	299	299	299	299	299	299	299	299	299			
2005		536,909	520,012	531,370	531,370	317	317	317	317	317	317	317	317	317	317	317	317	317			
2010		572,727	541,148	562,634	562,634	336	336	336	336	336	336	336	336	336	336	336	336	336			
2015		610,935	563,143	595,739	595,739	355	355	355	355	355	355	355	355	355	355	355	355	355			
2020		651,691	586,032	630,790	630,790	376	376	376	376	376	376	376	376	376	376	376	376	376			
2030		741,543	634,639	707,203	707,203	422	422	422	422	422	422	422	422	422	422	422	422	422			
2040		843,783	687,278	792,872	792,872	473	473	473	473	473	473	473	473	473	473	473	473	473			
2050		960,120	744,282	888,918	888,918	530	530	530	530	530	530	530	530	530	530	530	530	530			

Scenario 1

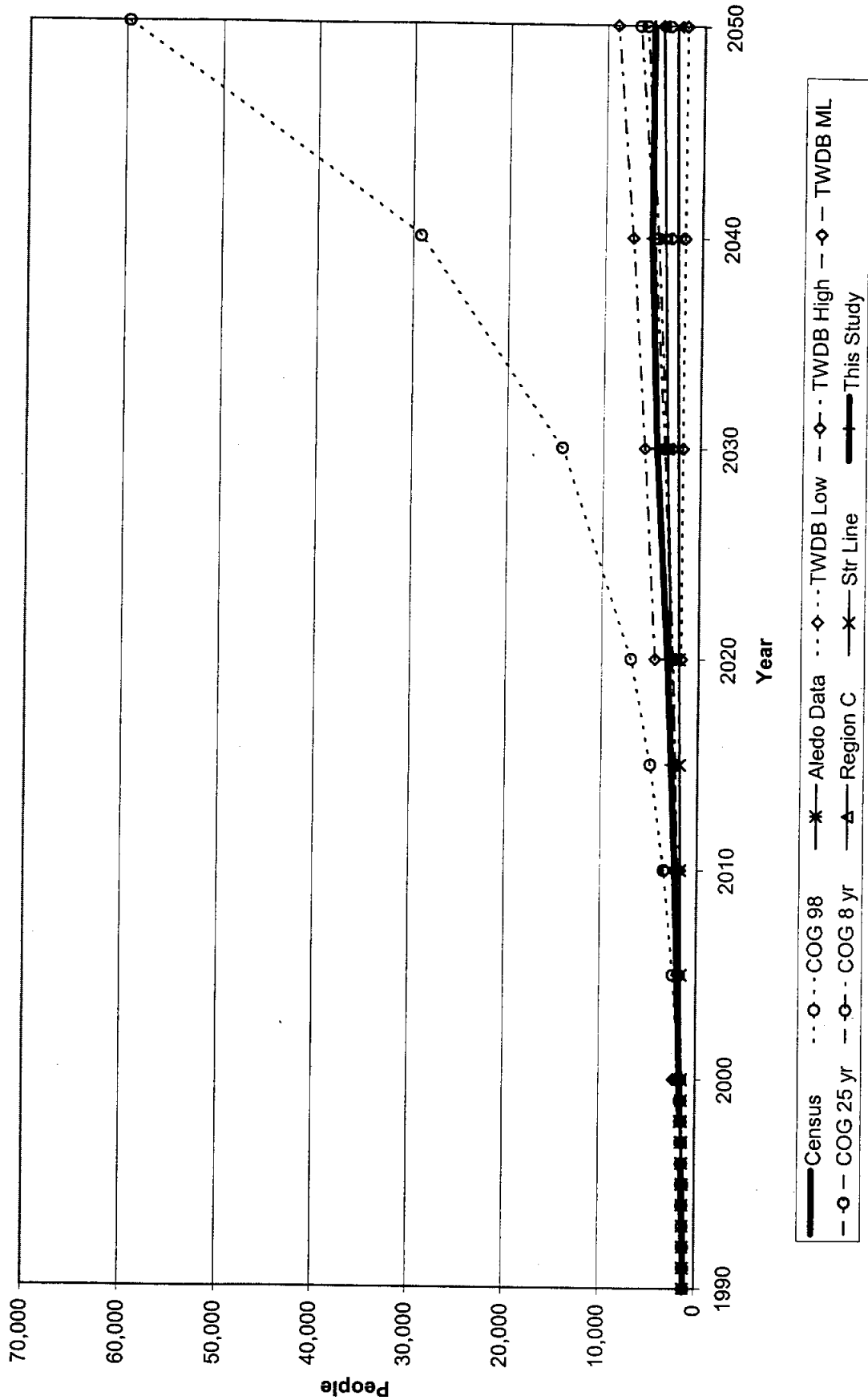
POPULATION HISTORY AND PROJECTIONS
Weatherford

Year	Census	3.78% COG 98	TWDB TWDB Low	TWDB TWDB High	TWDB TWDB ML	1.38% COG 25 yr	3.30% COG 8 yr	Self Reported	Region C	Straight Line Projection Str Line	Used In This Study This Study
1970	11,750	11,750				11,750					
1980	12,049	12,049				13,476					
1990	14,804	14,804	14,804	14,804	14,804	15,456	14,804			14,804	
1991	15,278					15,669	15,293			15,025	
1992	15,548					15,885	15,797			15,246	
1993	15,915					16,104	16,318			15,466	
1994	16,380					16,326	16,857			15,687	
1995	16,822	16,550				16,552	17,413			15,908	
1996	17,382					16,780	17,988			16,129	
1997		18,500				17,012	18,582			16,349	
1998		19,200				17,247	19,195			16,570	18,899
1999		19,925				17,485	19,828			16,791	19,485
2000		20,678			19,083	17,726	20,482		19,083	17,012	20,089
2005		24,893				18,983	24,093			18,115	23,402
2010		29,967	16,159	22,408		20,330	28,339			19,219	27,262
2015		36,076	17,281	31,848	23,895	21,772	33,334		23,895	20,323	31,757
2020		43,430	17,882	45,121	28,817	23,316	39,209		28,817	21,427	36,995
2030		62,939	18,151	58,126	34,099	26,741	54,249		34,099	23,634	50,203
2040		91,214	18,185	72,962	38,402	30,669	75,058		38,402	25,842	68,126
2050		132,189	18,219	91,585	43,248	35,174	103,848		43,248	28,049	92,448

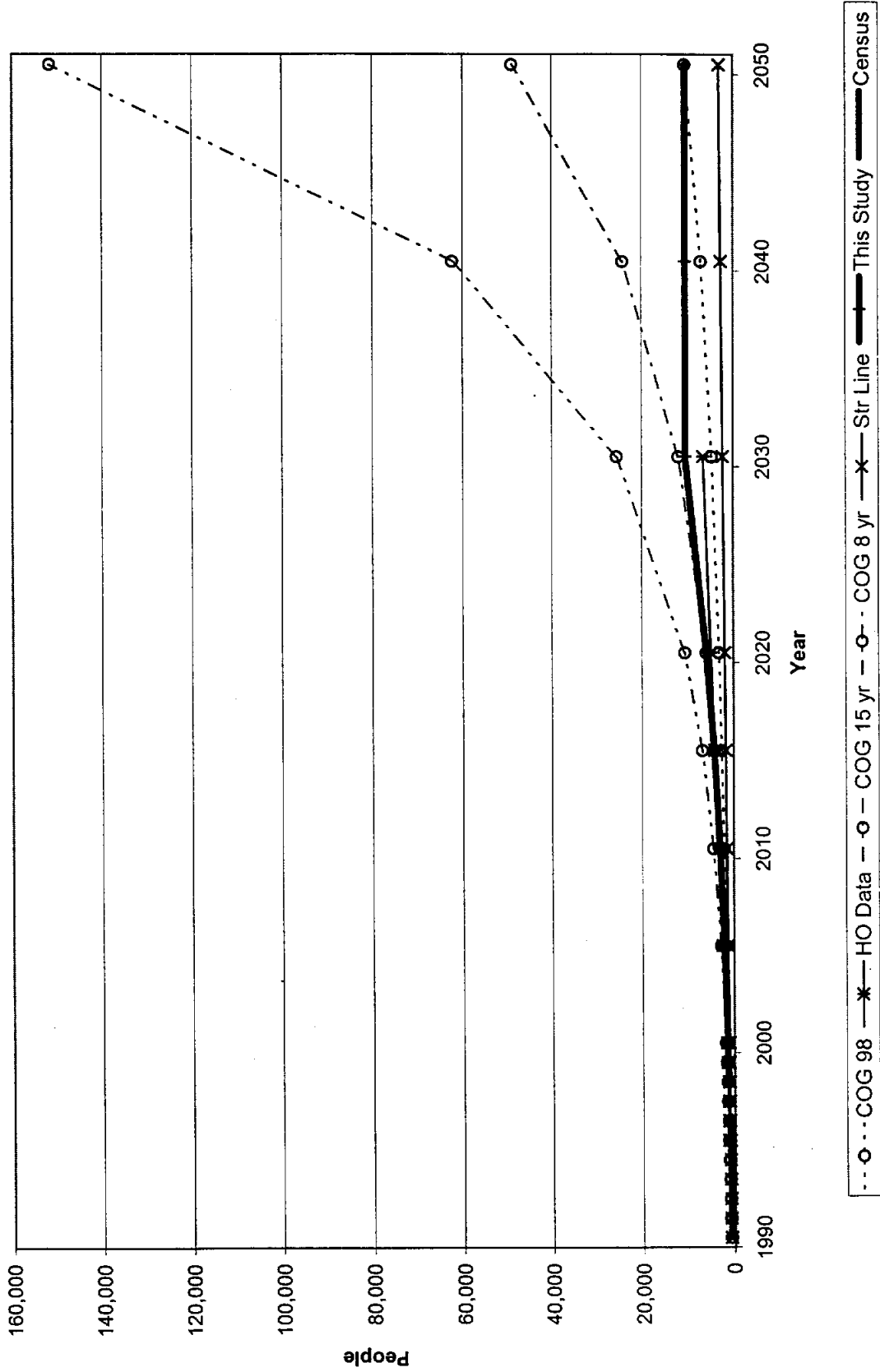
Willow Park Population



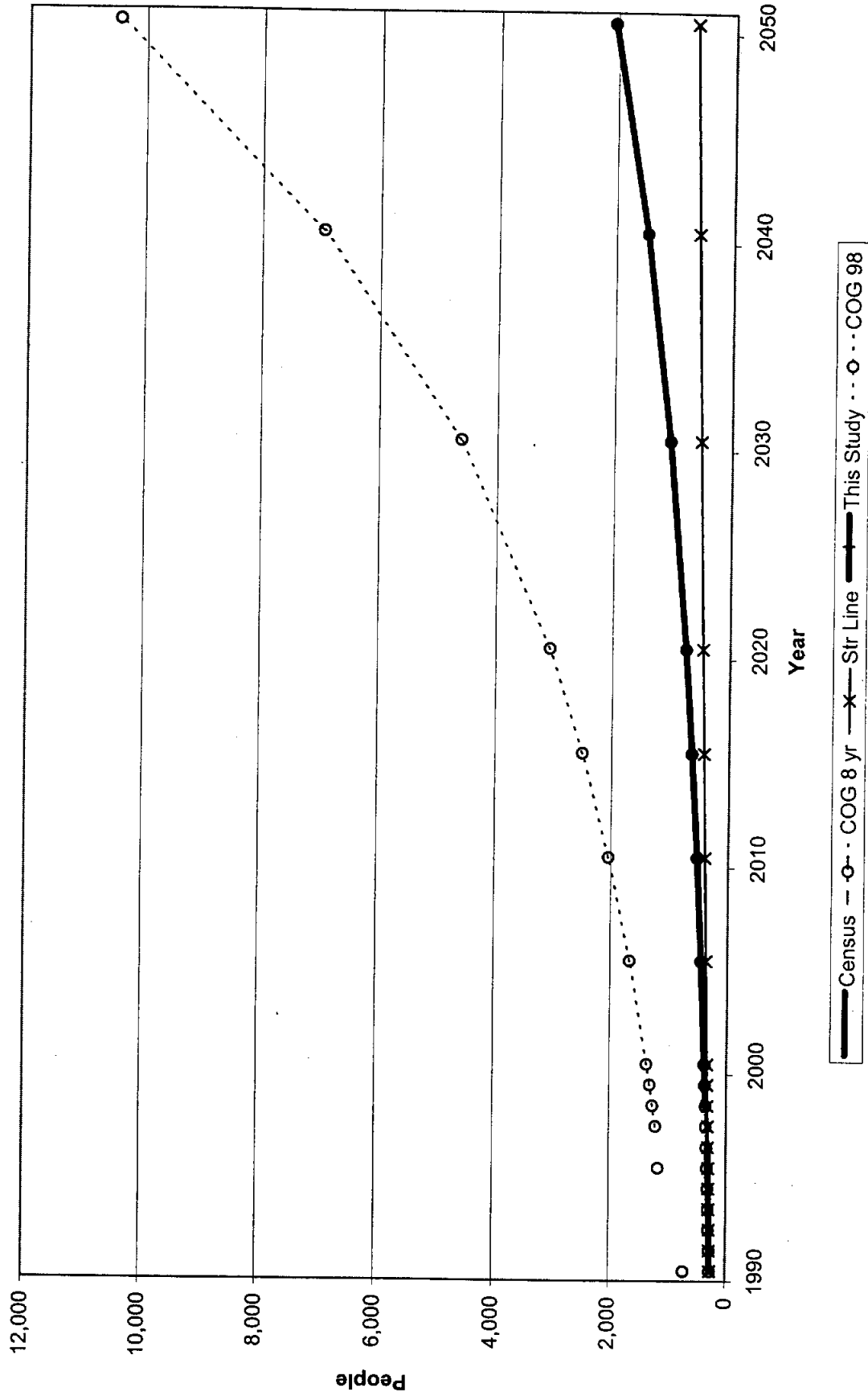
Aledo Population Trends



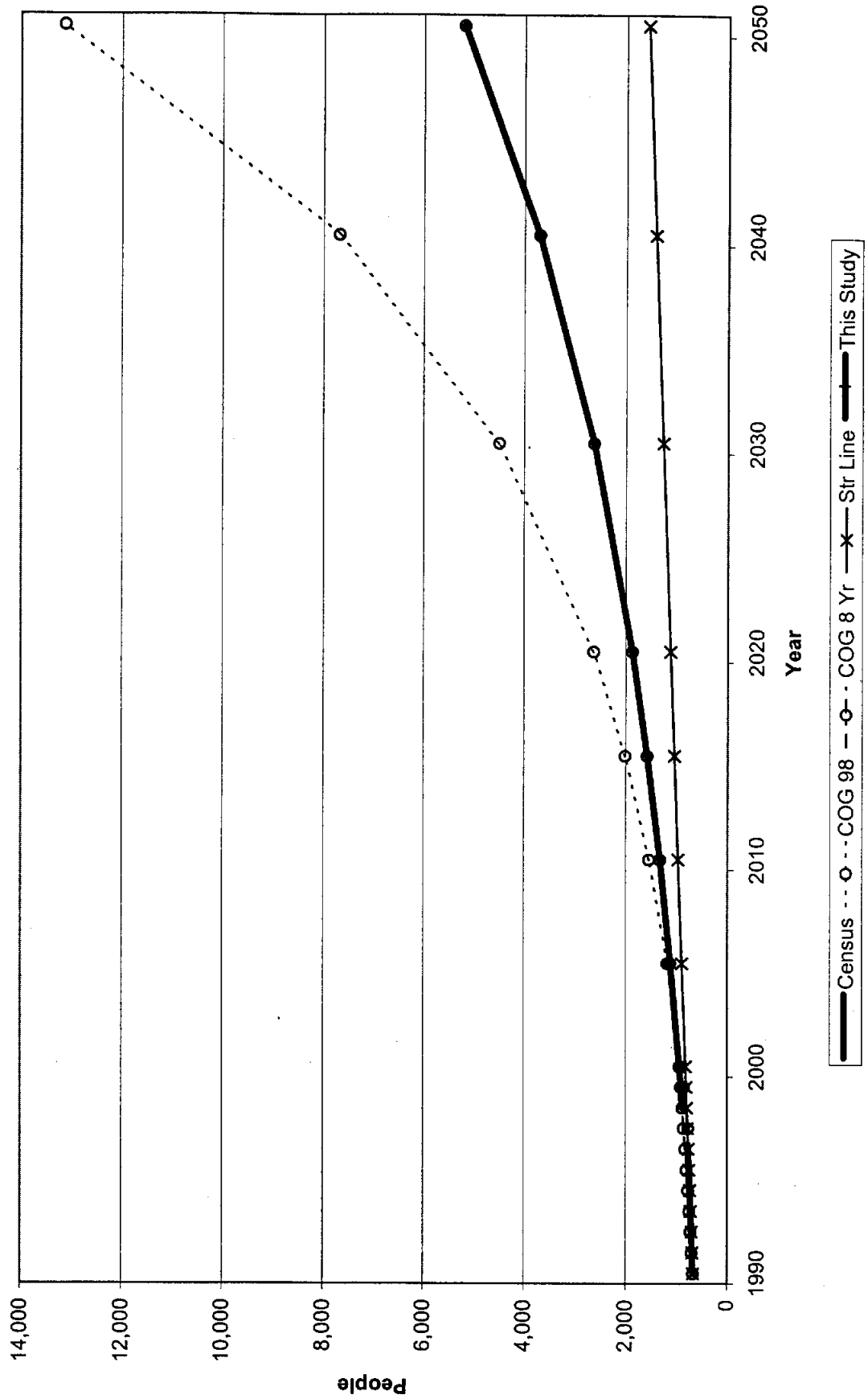
Hudson Oaks Population



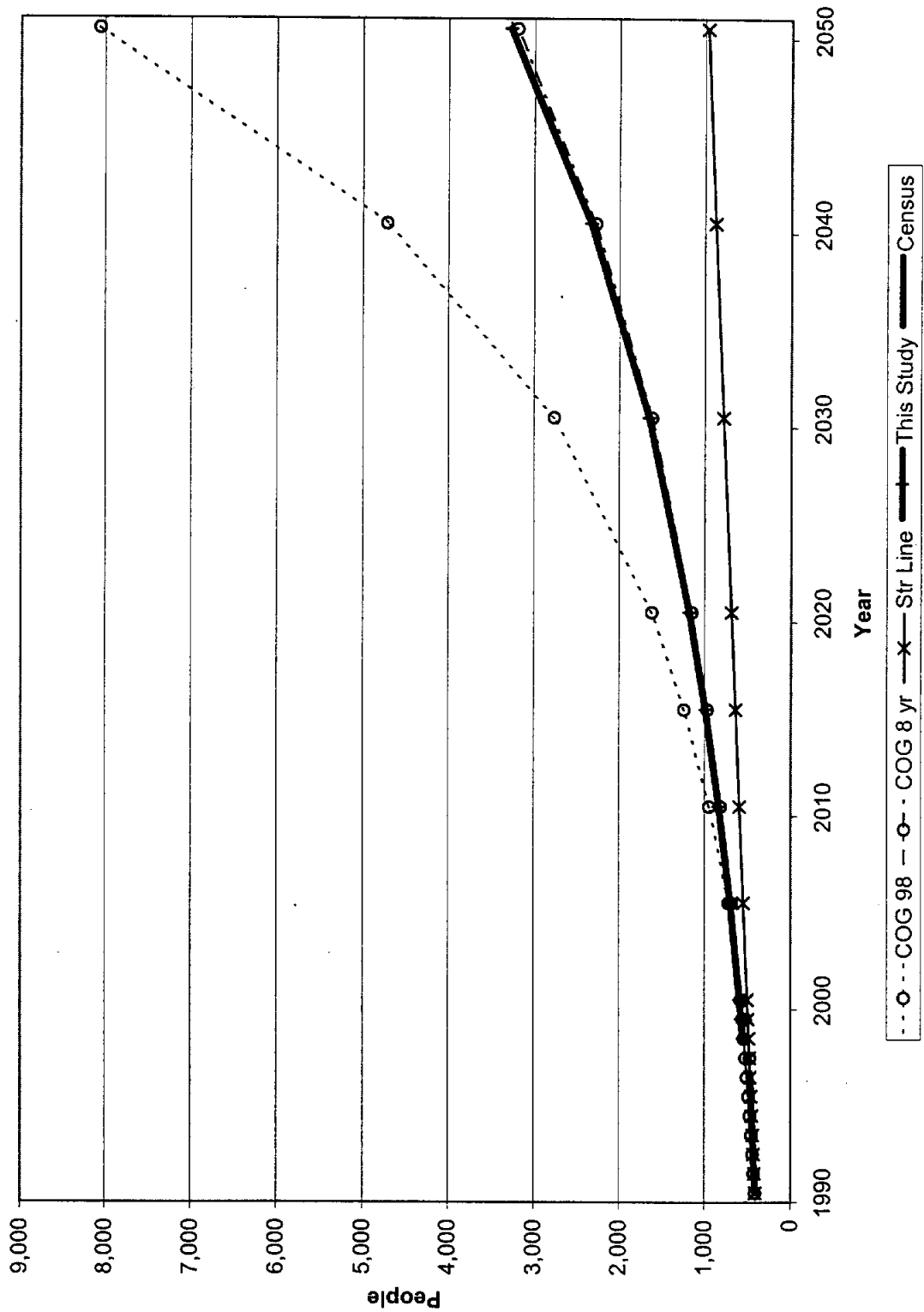
Annetta North Population



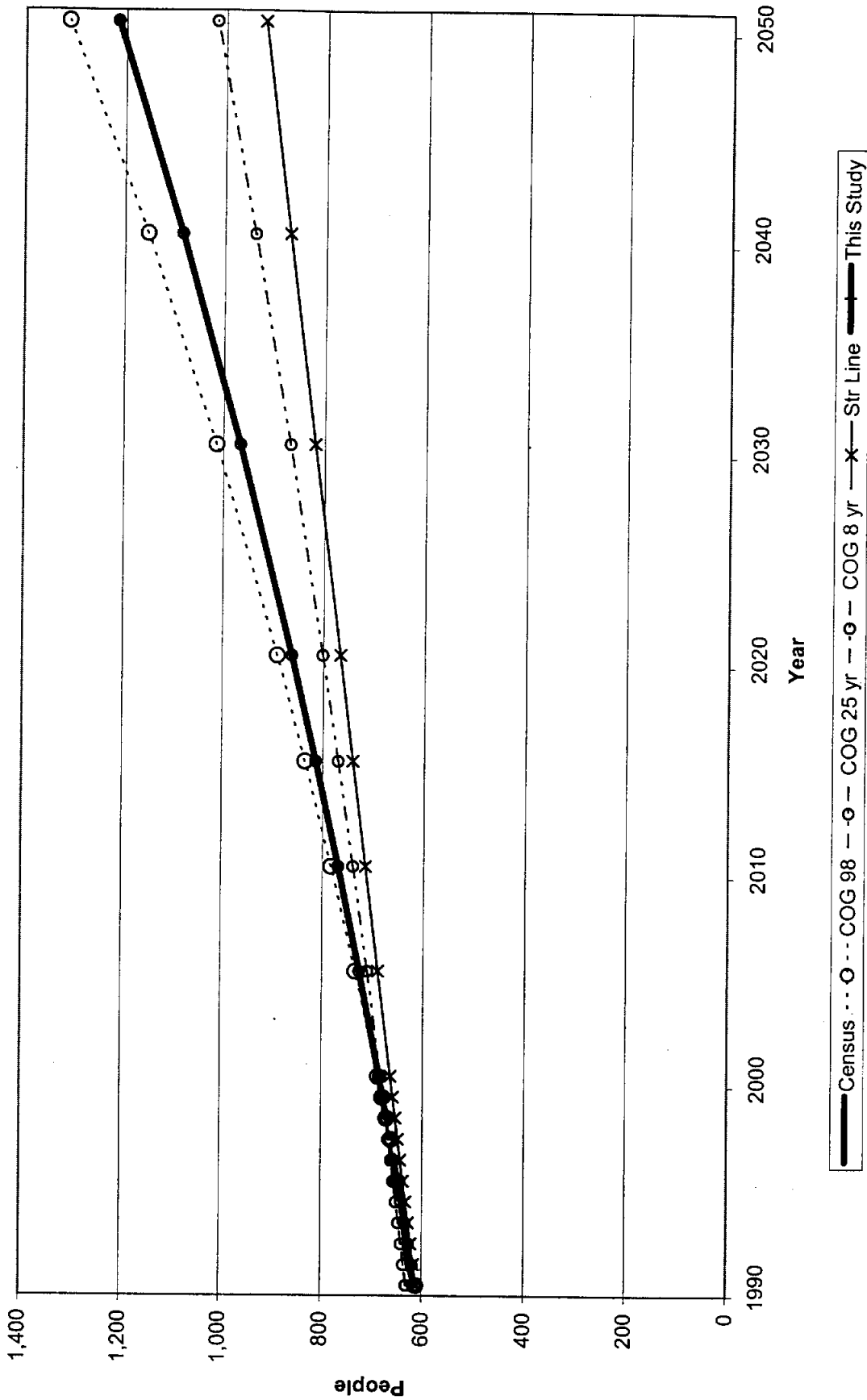
Annetta Population



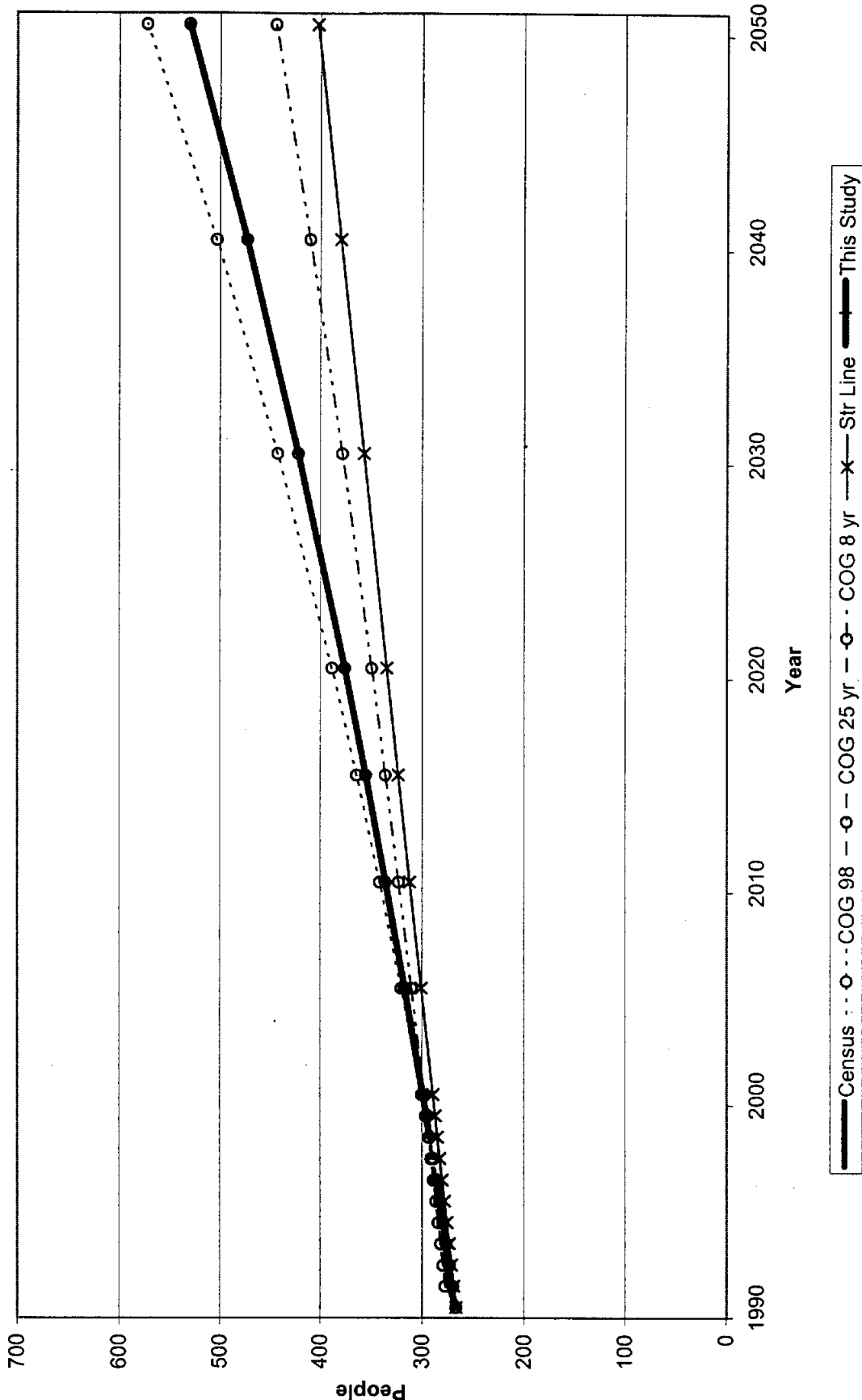
Annetta South Population



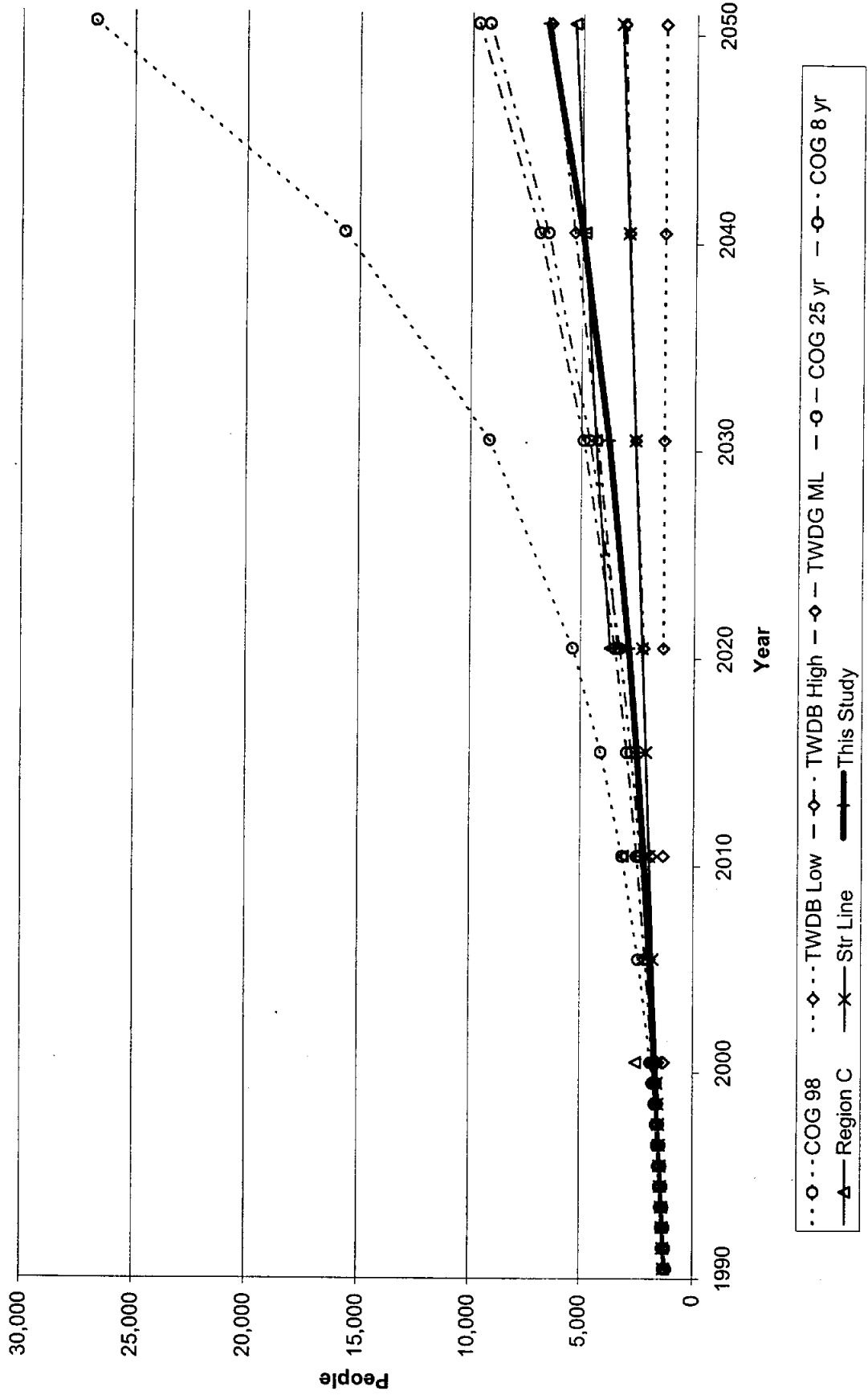
Fort Worth North ETJ Population



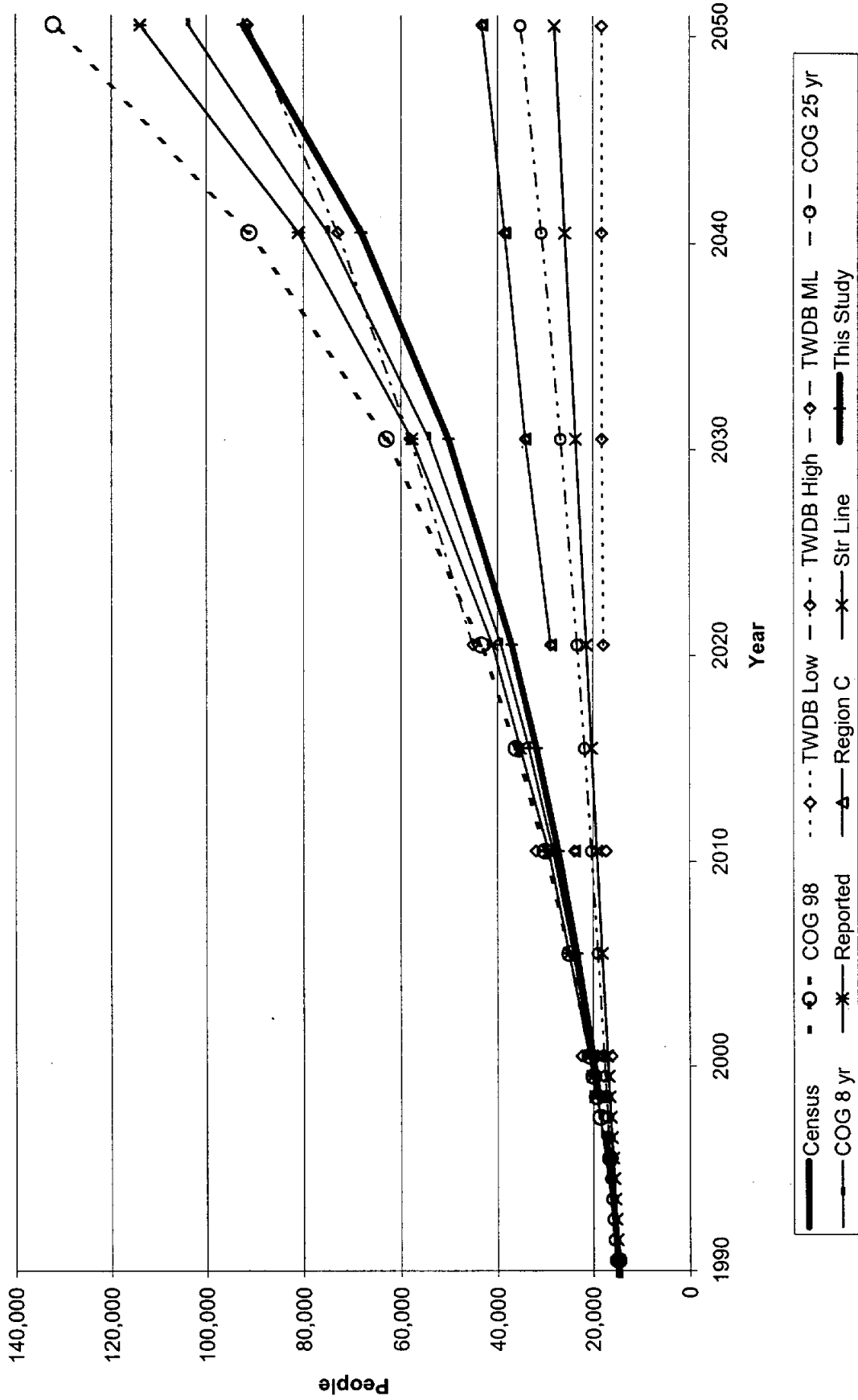
Fort Worth ETJ South



Non-Municipal SE Parker County Population



Weatherford Population



Scenario 1

POPULATION BY ENTITY
(Includes Weatherford for Line 1)
 (Capita)

1990 Census Population	2328	1169	711	265	672	423	612	267	1252	14804
Population Growth Rate/Yr.	3.40%	3.40%	7.31%	3.47%	3.47%	3.47%	1.15%	1.15%	2.80%	3.10%
Maximum Density/Acre	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Ultimate Population	26280	5173	10394	13536	11569	15081	42633	39162	75776	

Year	A	B	C	D	E	F	G	H	I	J		Total
	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta	Annetta South	Fort Worth North	Fort Worth South	Non-City SE Parker	Total	W'ford	
1998	3,042	1,527	1,250	348	883	556	671	293	1,562	10,131	18,899	19,602
1999	3,145	1,579	1,342	360	913	575	678	296	1,605	10,495	19,485	29,980
2000	3,252	1,633	1,440	373	945	595	686	299	1,650	10,874	20,089	30,963
2001	3,363	1,689	1,545	386	978	616	694	303	1,696	11,269	20,712	31,981
2002	3,477	1,746	1,658	399	1,012	637	702	306	1,744	11,681	21,354	33,035
2003	3,595	1,805	1,779	413	1,047	659	710	310	1,793	12,112	22,016	34,128
2004	3,718	1,867	1,909	427	1,083	682	718	313	1,843	12,561	22,699	35,259
2005	3,844	1,930	2,049	442	1,121	706	727	317	1,895	13,030	23,402	36,432
2006	3,975	1,996	2,198	457	1,160	730	735	321	1,948	13,519	24,128	37,647
2007	4,110	2,064	2,359	473	1,200	755	743	324	2,002	14,031	24,876	38,907
2008	4,250	2,134	2,532	490	1,242	782	752	328	2,058	14,566	25,647	40,213
2009	4,394	2,207	2,717	507	1,285	809	761	332	2,116	15,126	26,442	41,568
2010	4,544	2,282	2,915	524	1,329	837	769	336	2,175	15,711	27,262	42,972
2011	4,698	2,359	3,128	542	1,376	866	778	339	2,236	16,323	28,107	44,430
2012	4,858	2,439	3,357	561	1,423	896	787	343	2,299	16,963	28,978	45,942
2013	5,023	2,522	3,602	581	1,473	927	796	347	2,363	17,634	29,876	47,511
2014	5,194	2,608	3,866	601	1,524	959	805	351	2,429	18,337	30,803	49,139
2015	5,370	2,697	4,148	622	1,577	992	815	355	2,497	19,073	31,757	50,830
2016	5,553	2,788	4,452	643	1,631	1,027	824	359	2,567	19,845	32,742	52,587
2017	5,742	2,883	4,777	666	1,688	1,063	833	364	2,639	20,654	33,757	54,411
2018	5,937	2,981	5,126	689	1,747	1,099	843	368	2,713	21,502	34,803	56,306
2019	6,139	3,083	5,501	713	1,807	1,138	853	372	2,789	22,393	35,882	58,275
2020	6,347	3,187	5,903	737	1,870	1,177	862	376	2,867	23,328	36,995	60,322
2021	6,563	3,296	6,335	763	1,935	1,218	872	381	2,947	24,309	38,141	62,451
2022	6,786	3,408	6,798	789	2,002	1,260	882	385	3,030	25,340	39,324	64,664
2023	7,017	3,524	7,295	817	2,071	1,304	893	389	3,114	26,424	40,543	66,967
2024	7,256	3,643	7,828	845	2,143	1,349	903	394	3,202	27,563	41,800	69,362
2025	7,502	3,767	8,400	874	2,218	1,396	913	398	3,291	28,760	43,096	71,856
2026	7,758	3,895	9,014	905	2,295	1,444	924	403	3,383	30,021	44,432	74,452
2027	8,021	4,028	9,673	936	2,374	1,494	934	408	3,478	31,347	45,809	77,156
2028	8,294	4,165	10,380	969	2,457	1,546	945	412	3,576	32,743	47,229	79,972
2029	8,576	4,306	10,394	1,002	2,542	1,600	956	417	3,676	33,469	48,693	82,162
2030	8,868	4,453	10,394	1,037	2,630	1,655	967	422	3,779	34,204	50,203	84,406
2031	9,169	4,604	10,394	1,073	2,721	1,713	978	427	3,884	34,963	51,759	86,722
2032	9,481	4,761	10,394	1,110	2,816	1,772	989	432	3,993	35,747	53,363	89,111
2033	9,803	4,923	10,394	1,149	2,913	1,834	1,001	437	4,105	36,558	55,018	91,575
2034	10,136	5,090	10,394	1,189	3,014	1,897	1,012	442	4,220	37,394	56,723	94,117
2035	10,481	5,173	10,394	1,230	3,119	1,963	1,024	447	4,338	38,169	58,482	96,650
2036	10,837	5,173	10,394	1,273	3,227	2,031	1,036	452	4,460	38,883	60,294	99,177
2037	11,206	5,173	10,394	1,317	3,339	2,102	1,047	457	4,584	39,620	62,164	101,783
2038	11,587	5,173	10,394	1,363	3,455	2,175	1,060	462	4,713	40,381	64,091	104,471
2039	11,981	5,173	10,394	1,410	3,575	2,250	1,072	468	4,845	41,167	66,078	107,244
2040	12,388	5,173	10,394	1,459	3,699	2,328	1,084	473	4,980	41,979	68,126	110,105
2041	12,809	5,173	10,394	1,509	3,827	2,409	1,097	478	5,120	42,817	70,238	113,055
2042	13,245	5,173	10,394	1,562	3,960	2,493	1,109	484	5,263	43,683	72,415	116,098
2043	13,695	5,173	10,394	1,616	4,098	2,579	1,122	489	5,411	44,577	74,660	119,237
2044	14,161	5,173	10,394	1,672	4,240	2,669	1,135	495	5,562	45,500	76,975	122,475
2045	14,642	5,173	10,394	1,730	4,387	2,761	1,148	501	5,718	46,454	79,361	125,815
2046	15,140	5,173	10,394	1,790	4,539	2,857	1,161	507	5,878	47,439	81,821	129,260
2047	15,655	5,173	10,394	1,852	4,697	2,956	1,174	512	6,042	48,456	84,357	132,814
2048	16,187	5,173	10,394	1,916	4,860	3,059	1,188	518	6,212	49,507	86,972	136,479
2049	16,738	5,173	10,394	1,983	5,028	3,165	1,202	524	6,386	50,592	89,669	140,261
2050	17,307	5,173	10,394	2,052	5,203	3,275	1,215	530	6,564	51,713	92,448	144,161

Scenario 1

POPULATION SERVED BY PIPE
(Includes Weatherford for Line 1)
(Capite)

Pipe Year	A-I	J	A-H	A.C.D.G	G	A.C.D.	A	6	7	8	9	10	11	12	13	14	15	16	17	18	
1998	20,262	10,131	5,311	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719
1999	20,989	10,495	5,526	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719	6,719
2000	21,747	10,874	5,751	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886
2001	22,538	11,269	5,987	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072	7,072
2002	23,362	11,681	6,236	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279	7,279
2003	24,223	12,112	6,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497	7,497
2004	25,121	12,561	6,772	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718	7,718
2005	26,059	13,030	7,061	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972	7,972
2006	27,039	13,519	7,365	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244	8,244
2007	28,063	14,031	7,686	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534	8,534
2008	29,133	14,566	8,023	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837	8,837
2009	30,251	15,126	8,378	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154	9,154
2010	31,421	15,711	8,752	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494	9,494
2011	32,646	16,323	9,147	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868
2012	33,927	16,963	9,563	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267	10,267
2013	35,269	17,634	9,999	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691	10,691
2014	36,674	18,337	10,466	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139	11,139
2015	38,146	19,073	10,955	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614	11,614
2016	39,689	19,845	11,472	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119	12,119
2017	41,307	20,654	12,018	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654	12,654
2018	43,005	21,502	12,595	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219	13,219
2019	44,786	22,393	13,205	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814	13,814
2020	46,655	23,328	13,850	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434	14,434
2021	48,618	24,309	14,533	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088	15,088
2022	50,680	25,340	15,256	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767	15,767
2023	52,847	26,424	15,501	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471	16,471
2024	55,125	27,563	16,831	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201	17,201
2025	57,521	28,760	17,690	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059	18,059
2026	60,041	30,021	18,600	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046	19,046
2027	62,694	31,347	19,565	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161	20,161
2028	65,486	32,743	20,588	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314	21,314
2029	68,937	33,469	20,928	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504	22,504
2030	68,407	34,204	21,265	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734	23,734
2031	69,926	34,963	21,614	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004	25,004
2032	71,495	35,747	21,974	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314	26,314
2033	73,115	36,558	22,346	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664	27,664
2034	74,788	37,394	22,731	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054	29,054
2035	76,538	38,169	23,128	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484	30,484
2036	77,765	38,883	23,539	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954	31,954
2037	79,239	39,620	23,964	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464	33,464
2038	80,762	40,381	24,402	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014	35,014
2039	82,334	41,167	24,856	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604	36,604
2040	83,957	41,979	25,324	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234	38,234
2041	85,634	42,817	25,809	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904	39,904
2042	87,365	43,683	26,309	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614	41,614
2043	89,154	44,577	26,827	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364	43,364
2044	91,001	45,500	27,361	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154	45,154
2045	92,908	46,454	27,914	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004	47,004
2046	94,878	47,439	28,485	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914	48,914
2047	96,912	48,456	29,075	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884	50,884
2048	98,014	49,507	29,685	52,914	52,914	52,914	52,914														

OTHER DEMOGRAPHIC DATA

Entity	Census Population 1990	Census Population 1997	Area (Sq. Mi.)	Area (acres)	Density (pop/ac)	1990		1996		Sales per Business	Sales per Capita
						Avg Persons per House	Avg House Value	Gross Sales Business	Gross Sales		
FortWorth	447619	484500	287.4	183936	2.63	2.70	\$59,900	15314	\$16,667,228,274	\$1,088,365	\$34,401
Weatherford	14804	18550	18.1	11584	1.60	2.48	\$53,300	910	\$666,998,570	\$732,965	\$35,957
Azle	1244										
Mineral Wells	31										
Reno	2322										
Springtown	1740										
Sanctuary	234										
Aledo	1169	1412	1.8	1152	1.23	2.85	\$67,300	85	\$14,482,427	\$170,381	\$10,257
Willow Park	2328	3284	5.4	3456	0.95	2.95	\$103,100	89	\$25,166,862	\$282,774	\$7,663
Hudson Oaks	711	1165	1.8	1152	1.01	2.81	\$94,600	53	\$218,665,642	\$4,125,767	\$187,696
Annetta North	265	336	2.5	1600	0.21	2.77	\$116,100	11	\$725,933	\$65,994	\$2,161
Annetta	672	853	2.4	1536	0.56	3.03	\$121,700	27	\$1,943,986	\$71,999	\$2,279
Annetta South	413	524	1.9	1216	0.43	3.00	\$115,200	4	\$4,264	\$1,066	\$8
Millsap	485										
Cool	214										
Poolville	100										
Peaster	150										
Brock	100										
Dennis	100										
Tin Top	100										
Horseshoe Bend	100										
Total	27282										
County Total	64785										
Total of Remainder	37503										
Total per Precinct	9376										
Split											
Fort Worth Portion	4842.33										0.52
Remaining Portion	4533.42										0.48

APPENDIX J - TEXAS WATER DEVELOPMENT BOARD WATER USE DATA

TWDB Big City Usage Data - Page 1

TWDB Big City Usage Data - Page 2

TWDB Big City Usage Data - Page 3

TWDB Big City Usage Data - Page 4

TWDB Big City Usage Data - Page 5

TWDB Big City Usage Data - Page 6

TWDB Big City Usage Data - Page 7

TWDB Big City Usage Data - Page 8

TWDB Big City Usage Data - TRWD Area Cities

Scenario 1

**ACTUAL AVERAGE DAILY WATER USE
BY LARGER CITIES WITHIN THE TARRANT REGIONAL WATER DISTRICT AREA**

Gallons per Capita Day
(As reported to TWDB by survey of each city)

Year	Arlington	Bedford	Eules	Fort Worth	Hurst	North Richland Hills	W'ford	Average
1980	224	181	163	213	171	170	185	187
1982	165	143	132	198	133	109		147
1982	167	161	129	197	131	123		151
1983	156	163	136	178	133	109		146
1984	177	171	169	201	159	125		167
1985	175	177	149	201	164	129	110	158
1986	161	188	190	205	146	113	92	156
1987	165	190	198	208	149	118	99	161
1988	171	194	194	208	167	122	99	165
1989	145	160	148	199	107	129	140	147
1990	164	158	138	210	160	123	123	154
1991	139	155	129	198	147	115	129	145
1992	146	145	122	179	138	110	132	139
1993	165	143	119	196	152	137	156	153
1994	157	152	126	183	134	120	147	146
1995	162	158	118	189	135	122	126	144
1996	168	159	143	201	147	128	143	156
Average gpcd	165	165	147	198	145	124	129	154
Avg. gpm/tap	0.35	0.33	0.30	0.42	0.31	0.27	0.30	0.32
1996 Pop.	295553	48445	44632	478480	38461	53501	20000	139,867
Avg. mgd	48.80	7.97	6.57	94.68	5.59	6.62	2.59	21.55
Calc. Taps	98,518	16,148	14,877	159,493	12,820	17,834	6,667	46,622
Design gpm	59,111	9,689	8,926	95,696	7,692	10,700	4,000	27,973
Design mgd	85.12	13.95	12.85	137.80	11.08	15.41	5.76	40.28

Scenario 1

ACTUAL AVERAGE DAILY WATER USE BY LARGER TEXAS CITIES
Gallons per Capita Day

(As reported to TWDB by survey of each city)

Page 1

Year	Abilene	Amarillo	Arlington	Austin	Baytown	Beaumont	Bedford
1980	208	198	224	203	136	160	181
1981	187	180	165	192	140	151	143
1982	173	176	167	212	142	153	161
1983	197	223	156	191	116	158	163
1984	177	196	177	221	135	162	171
1985	139	184	175	202	132	158	177
1986	158	191	161	188	134	148	188
1987	159	192	165	175	134	138	190
1988	147	187	171	186	135	144	194
1989	168	199	145	190	154	146	160
1990	216	234	164	180	143	158	158
1991	152	232	139	168	131	145	155
1992	140	230	146	172	128	143	145
1993	174	217	165	176	133	149	143
1994	177	226	157	153	122	152	152
1995	159	223	162	157	123	159	158
1996	210	230	168	173	129	177	159
Average gpcd	173	207	165	185	133	153	165
Average gpm/tap	0.44	0.48	0.35	0.36	0.27	0.37	0.33
1996 Population	116474	171891	295553	563052	70341	115457	48445
Average MGD	20.15	35.57	48.80	103.97	9.38	17.66	7.97
Calculated Taps	38,825	57,297	98,518	187,684	23,447	38,486	16,148
Design gpm	23,295	34,378	59,111	112,610	14,068	23,091	9,689
Design MGD	33.54	49.50	85.12	162.16	20.26	33.25	13.95

- NOTES:
- 1) Gpcd = gallons per capita (person) per day
 - 2) Gpm = gallons per minute
 - 3) Mgd = million gallons per day
 - 4) Calculations assume 3 people per tap as used in the study
 - 5) Design flows based on TNRCC criteria of 0.6 gpm per tap
 - 6) Fort Worth conservation plan filed with TWDB and Tarrant Regional Water District sets a goal of 200 average gpcd maximum for the Fort Worth system.

ACTUAL AVERAGE DAILY WATER USE BY LARGER TEXAS CITIES
Gallons per Capita Day

(As reported to TWDB by survey of each city)

Page 2

Year	Brownsville	Bryan	Carrollton	College Station	Corpus Christi	Dallas	Denton
1980	187	174	180	234	227	225	184
1981	161	148	152	349	164	179	142
1982	220	172	163	261	175	187	139
1983	182	165	176	242	159	215	176
1984	180	176	202	263	162	230	195
1985	203	145	220	246	148	239	177
1986	188	126	185	233	131	218	175
1987	180	145	191	251	147	221	188
1988	150	150	209	289	211	254	198
1989	172	155	185	243	251	237	172
1990	191	153	179	244	232	237	171
1991	178	139	168	226	164	223	158
1992	172	149	162	234	162	230	152
1993	176	155	169	249	161	235	156
1994	174	142	156	225	148	208	124
1995	184	140	160	220	140	230	154
1996	134	136	167	237	141	230	165
Average gpcd	178	151	178	250	172	223	166
Average gpm/tap	0.28	0.28	0.35	0.49	0.29	0.48	0.34
1996 Population	132012	61715	97008	62644	275100	1062218	74645
Average MGD	23.54	9.33	17.26	15.65	47.30	237.31	12.41
Calculated Taps	44,004	20,572	32,336	20,881	91,700	354,073	24,882
Design gpm	26,402	12,343	19,402	12,529	55,020	212,444	14,929
Design MGD	38.02	17.77	27.94	18.04	79.23	305.92	21.50

NOTES!	1)	Gpcd = gallons per capita (person) per day
	2)	Gpm = gallons per minute
	3)	Mgd = million gallons per day
	4)	Calculations assume 3 people per tap as used in the study
	5)	Design flows based on TNRCC criteria of 0.6 gpm per tap
	6)	Fort Worth conservation plan filed with TWDB and Tarrant Regional Water District sets a goal of 200 average gpcd maximum for the Fort Worth system.

ACTUAL AVERAGE DAILY WATER USE BY LARGER TEXAS CITIES
Gallons per Capita Day

(As reported to TWDB by survey of each city)

Page 3

Year	Duncanville	El Paso	Eules	Fort Worth	Galveston	Garland	Grand Prairie
1980	176	187	163	213	198	168	137
1981	147	173	132	198	175	144	127
1982	153	183	129	197	171	144	124
1983	146	179	136	178	165	146	129
1984	169	157	169	201	179	169	148
1985	171	165	149	201	181	167	158
1986	157	175	190	205	173	163	139
1987	166	186	198	208	171	163	150
1988	162	183	194	208	176	169	146
1989	156	194	148	199	163	153	126
1990	163	183	138	210	174	158	154
1991	148	168	129	198	167	143	129
1992	145	168	122	179	162	160	129
1993	153	179	119	196	165	153	130
1994	146	179	126	183	207	139	115
1995	147	179	118	189	227	151	121
1996	157	178	143	201	210	150	138
Average gpcd	157	177	147	198	180	155	135
Average gpm/tap	0.33	0.37	0.30	0.42	0.44	0.31	0.29
1996 Population	36429	587442	44632	478480	64371	191254	109196
Average MGD	5.70	104.22	6.57	94.68	11.60	29.70	14.77
Calculated Taps	12,143	195,814	14,877	159,493	21,457	63,751	36,399
Design gpm	7,286	117,488	8,926	95,696	12,874	38,251	21,839
Design MGD	10.49	169.18	12.85	137.80	18.54	55.08	31.45

NOTES!	1)	Gpcd = gallons per capita (person) per day
	2)	Gpm = gallons per minute
	3)	Mgd = million gallons per day
	4)	Calculations assume 3 people per tap as used in the study
	5)	Design flows based on TNRCC criteria of 0.6 gpm per tap
	6)	Fort Worth conservation plan filed with TWDB and Tarrant Regional Water District sets a goal of 200 average gpcd maximum for the Fort Worth system.

Scenario 1

ACTUAL AVERAGE DAILY WATER USE BY LARGER TEXAS CITIES
Gallons per Capita Day

(As reported to TWDB by survey of each city)

Page 4

Year	Harlingen	Houston	Hurst	Irving	Killeen	Laredo	Lewisville
1980	188	198	171	201	121	218	161
1981	128	192	133	146	108	183	148
1982	186	186	131	163	113	190	154
1983	117	159	133	166	106	158	171
1984	157	175	159	196	113	159	217
1985	137	184	164	213	121	159	232
1986	144	187	146	281	119	187	237
1987	97	168	149	221	122	179	223
1988	137	151	167	225	105	175	217
1989	170	149	107	181	102	200	154
1990	150	157	160	188	112	254	155
1991	148	171	147	170	102	237	157
1992	124	168	138	175	102	208	155
1993	145	168	152	196	116	191	145
1994	157	149	134	184	103	212	144
1995	180	126	135	196	106	190	151
1996	182	180	147	204	113	181	155
Average gpcd	5	169	145	194	111	193	175
Average gpm/tap	0.38	0.38	0.31	0.43	0.24	0.38	0.32
1996 Population	55,999	1,761,754	38,461	172,856	80,962	164,233	61,283
Average MGD	0.28	297.22	5.59	33.62	8.97	31.70	10.73
Calculated Taps	18,666	587,251	12,820	57,619	26,987	54,744	20,428
Design gpm	11,200	352,351	7,692	34,571	16,192	32,847	12,257
Design MGD	16.13	507.39	11.08	49.78	23.32	47.30	17.65

NOTES!

- 1) Gpcd = gallons per capita (person) per day
- 2) Gpm = gallons per minute
- 3) Mgd = million gallons per day
- 4) Calculations assume 3 people per tap as used in the study
- 5) Design flows based on TNRCC criteria of 0.6 gpm per tap
- 6) Fort Worth conservation plan filed with TWDB and Tarrant Regional Water District sets a goal of 200 average gpcd maximum for the Fort Worth system.

Scenario 1

ACTUAL AVERAGE DAILY WATER USE BY LARGER TEXAS CITIES

Gallons per Capita Day

(As reported to TWDB by survey of each city)

Page 5

Year	Longview	Lubbock	McAllen	Mesquite	Midland	Missouri City	North Richland Hills
1980	130	178	175	132	220	150	170
1981	92	158	172	124	201	107	109
1982	110	159	202	135	213	116	123
1983	153	174	171	137	245	159	109
1984	169	163	192	170	242	177	125
1985	176	160	168	151	230	170	129
1986	169	154	161	140	196	158	113
1987	162	160	200	161	178	167	118
1988	158	161	187	164	188	171	122
1989	189	175	207	149	229	153	129
1990	156	176	242	152	206	166	123
1991	158	160	215	136	208	145	115
1992	159	151	205	127	198	145	110
1993	110	163	199	148	211	143	137
1994	116	178	192	137	229	130	120
1995	119	189	164	165	222	141	122
1996	123	185	157	145	243	138	128
Average gpcd	144	167	189	145	215	149	124
Average gpm/tap	0.26	0.39	0.33	0.30	0.51	0.29	0.27
1996 Population	74,758	194,188	102,094	112,686	97,549	53,672	53,501
Average MGD	10.77	32.49	19.27	16.39	21.00	8.01	6.62
Calculated Taps	24,919	64,729	34,031	37,562	32,516	17,891	17,834
Design gpm	14,952	38,838	20,419	22,537	19,510	10,734	10,700
Design MGD	21.53	55.93	29.40	32.45	28.09	15.46	15.41

- NOTES:
- 1) Gpcd = gallons per capita (person) per day
 - 2) Gpm = gallons per minute
 - 3) Mgd = million gallons per day
 - 4) Calculations assume 3 people per tap as used in the study
 - 5) Design flows based on TNRCC criteria of 0.6 gpm per tap
 - 6) Fort Worth conservation plan filed with TWDB and Tarrant Regional Water District sets a goal of 200 average gpcd maximum for the Fort Worth system.

Scenario 1

ACTUAL AVERAGE DAILY WATER USE BY LARGER TEXAS CITIES

Gallons per Capita Day

(As reported to TWDB by survey of each city)

Page 6

Year	Odessa	Pasadena	Plano	Port Arthur	Richardson	Round Rock	San Angelo
1980	214	150	200	130	207	208	254
1980	175	115	149	124	165	164	194
1981	184	110	149	142	155	191	206
1982	179	97	164	156	171	207	232
1983	169	95	200	144	192	253	222
1984	172	103	223	151	201	377	175
1985	138	89	192	164	209	244	175
1986	143	105	214	161	217	224	163
1987	167	115	221	148	243	207	182
1988	189	117	216	134	215	189	214
1989	185	129	210	111	235	175	191
1990	200	117	202	147	207	144	196
1991	169	82	203	142	208	147	204
1992	176	114	218	180	227	183	162
1993	191	116	203	179	211	198	185
1994	178	117	220	186	226	203	178
1995	192	128	227	182	244	229	193
Average gpcd	178	112	201	152	208	208	196
Average gpm/tap	0.40	0.27	0.47	0.38	0.51	0.48	0.40
1996 Population	94,118	131,754	181,991	58,232	86,352	48,961	89,567
Average MGD	16.73	14.72	36.52	8.84	17.95	10.20	17.52
Calculated Taps	31,373	43,918	60,664	19,411	28,784	16,320	29,856
Design gpm	18,824	26,351	36,398	11,646	17,270	9,792	17,913
Design MGD	27.11	37.95	52.41	16.77	24.87	14.10	25.80

- NOTES!
- 1) Gpcd = gallons per capita (person) per day
 - 2) Gpm = gallons per minute
 - 3) Mgd = million gallons per day
 - 4) Calculations assume 3 people per tap as used in the study
 - 5) Design flows based on TNRCC criteria of 0.6 gpm per tap
 - 6) Fort Worth conservation plan filed with TWDB and Tarrant Regional Water District sets a goal of 200 average gpcd maximum for the Fort Worth system.

Scenario 1

ACTUAL AVERAGE DAILY WATER USE BY LARGER TEXAS CITIES

Gallons per Capita Day

(As reported to TWDB by survey of each city)

Page 7

Year	San Antonio	Sugarland	Temple	Texas City	Tyler	Victoria	Waco
1980	208	170	177	127	197	139	261
1981	182	197	146	135	167	137	227
1982	207	160	150	153	166	163	209
1983	180	131	147	125	154	145	203
1984	195	138	177	129	182	161	217
1985	168	166	181	137	190	165	190
1986	173	130	205	136	174	154	192
1987	162	134	198	119	187	152	188
1988	177	138	206	119	266	162	193
1989	177	143	180	122	190	160	189
1990	159	155	203	127	181	148	198
1991	148	147	179	123	155	140	170
1992	145	147	182	116	168	145	182
1993	139	142	183	121	187	147	202
1994	143	131	187	125	192	145	197
1995	149	122	194	131	212	147	172
1996	147	110	217	148	198	164	184
Average gpcd	168	145	183	129	186	151	198
Average gpm/tap	0.31	0.23	0.45	0.31	0.41	0.34	0.38
1996 Population	1098642	52967	50097	42224	81303	61200	109225
Average MGD	184.77	7.67	9.17	5.45	15.14	9.27	21.68
Calculated Taps	366,214	17,656	16,699	14,075	27,101	20,400	36,408
Design gpm	219,728	10,593	10,019	8,445	16,261	12,240	21,845
Design MGD	316.41	15.25	14.43	12.16	23.42	17.63	31.46

- NOTES!
- 1) Gpcd = gallons per capita (person) per day
 - 2) Gpm = gallons per minute
 - 3) Mgd = million gallons per day
 - 4) Calculations assume 3 people per tap as used in the study
 - 5) Design flows based on TNRCC criteria of 0.6 gpm per tap
 - 6) Fort Worth conservation plan filed with TWDB and Tarrant Regional Water District sets a goal of 200 average gpcd maximum for the Fort Worth system.

ACTUAL AVERAGE DAILY WATER USE BY LARGER TEXAS CITIES
Gallons per Capita Day

(As reported to TWDB by survey of each city)

Page 8

Year	W'ford	Witchita Falls	Average
1980	185	166	184
1981		161	160
1982		174	166
1983		178	165
1984		232	179
1985	110	154	176
1986	92	152	169
1987	99	153	169
1988	99	132	176
1989	140	149	171
1990	123	169	175
1991	129	199	163
1992	132	178	160
1993	156	186	167
1994	147	186	163
1995	126	157	165
1996	143	192	173
Average gpcd	129	172	166
Average gpm/tap	0.30	0.40	0.36
1996 Population	20,000	100,501	195,872
Average MGD	2.59	17.25	35
Calculated Taps	6,667	33,500	65,291
Design gpm	4,000	20,100	39,174
Design MGD	5.76	28.94	56.41
NOTES:	1)	Gpcd = gallons per capita (person) per day	
	2)	Gpm = gallons per minute	
	3)	Mgd = million gallons per day	
	4)	Calculations assume 3 people per tap as used in the study	
	5)	Design flows based on TNRCC criteria of 0.6 gpm per tap	
	6)	Fort Worth conservation plan filed with TWDB and Tarrant Regional Water District sets a goal of 200 average gpcd maximum for the Fort Worth system.	

APPENDIX K - LAND AREA AND WELL USE

Land Area By Entity

Land Area By Pipe

Wells By Entity

Well Areas - 500' Radius

Well Areas - 150' Radius

Scenario 1

SERVICE LAND AREAS BY ENTITY
STUDY AREA ONLY (Excludes Weatherford)
(Acres)

Existing Land Area (acres)	5,013	1,252	1,770	1,999	1,066	931	2	2	83,805	95,841
Ultimate Land Area (acres)	10,512	2,069	4,157	5,414	4,628	6,033	17,053	15,665	30,310	95,841
Current vs. Ultimate	48%	61%	43%	37%	23%	15%	0%	0%	276%	100%
Annexation Growth Rate/Yr	10%	10%	10%	10%	10%	10%	20%	20%	10%	
Maximum Expansion Year	2006	2004	2007	2009	2014	2018	2048	2048		

Year	A	B	C	D	E	F	G	H	I	J		
	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta	Annetta South	Fort Worth North	Fort Worth South	Non-City SE Parker	Total	W'ford	Total
1998	5,013	1,252	1,770	1,999	1,066	931	2	2	83,805	95,841	N/A	N/A
1999	5,515	1,378	1,947	2,199	1,173	1,024	2	2	82,601	95,841	N/A	N/A
2000	6,066	1,515	2,142	2,418	1,290	1,126	3	3	81,277	95,841	N/A	N/A
2001	6,673	1,667	2,356	2,660	1,419	1,239	3	3	79,820	95,841	N/A	N/A
2002	7,340	1,833	2,592	2,926	1,561	1,363	4	4	78,217	95,841	N/A	N/A
2003	8,074	2,017	2,851	3,219	1,717	1,499	5	5	76,454	95,841	N/A	N/A
2004	8,882	2,069	3,136	3,541	1,889	1,649	6	6	74,663	95,841	N/A	N/A
2005	9,770	2,069	3,449	3,895	2,078	1,814	7	7	72,751	95,841	N/A	N/A
2006	10,512	2,069	3,794	4,284	2,286	1,996	9	9	70,882	95,841	N/A	N/A
2007	10,512	2,069	4,157	4,713	2,514	2,195	10	10	69,659	95,841	N/A	N/A
2008	10,512	2,069	4,157	5,184	2,766	2,415	12	12	68,713	95,841	N/A	N/A
2009	10,512	2,069	4,157	5,414	3,042	2,656	15	15	67,960	95,841	N/A	N/A
2010	10,512	2,069	4,157	5,414	3,346	2,922	18	18	67,384	95,841	N/A	N/A
2011	10,512	2,069	4,157	5,414	3,681	3,214	21	21	66,750	95,841	N/A	N/A
2012	10,512	2,069	4,157	5,414	4,049	3,535	26	26	66,052	95,841	N/A	N/A
2013	10,512	2,069	4,157	5,414	4,454	3,889	31	31	65,283	95,841	N/A	N/A
2014	10,512	2,069	4,157	5,414	4,628	4,278	37	37	64,708	95,841	N/A	N/A
2015	10,512	2,069	4,157	5,414	4,628	4,706	44	44	64,266	95,841	N/A	N/A
2016	10,512	2,069	4,157	5,414	4,628	5,176	53	53	63,778	95,841	N/A	N/A
2017	10,512	2,069	4,157	5,414	4,628	5,694	64	64	63,239	95,841	N/A	N/A
2018	10,512	2,069	4,157	5,414	4,628	6,033	77	77	62,874	95,841	N/A	N/A
2019	10,512	2,069	4,157	5,414	4,628	6,033	92	92	62,844	95,841	N/A	N/A
2020	10,512	2,069	4,157	5,414	4,628	6,033	110	110	62,807	95,841	N/A	N/A
2021	10,512	2,069	4,157	5,414	4,628	6,033	132	132	62,763	95,841	N/A	N/A
2022	10,512	2,069	4,157	5,414	4,628	6,033	159	159	62,710	95,841	N/A	N/A
2023	10,512	2,069	4,157	5,414	4,628	6,033	191	191	62,646	95,841	N/A	N/A
2024	10,512	2,069	4,157	5,414	4,628	6,033	229	229	62,570	95,841	N/A	N/A
2025	10,512	2,069	4,157	5,414	4,628	6,033	275	275	62,478	95,841	N/A	N/A
2026	10,512	2,069	4,157	5,414	4,628	6,033	330	330	62,368	95,841	N/A	N/A
2027	10,512	2,069	4,157	5,414	4,628	6,033	396	396	62,236	95,841	N/A	N/A
2028	10,512	2,069	4,157	5,414	4,628	6,033	475	475	62,078	95,841	N/A	N/A
2029	10,512	2,069	4,157	5,414	4,628	6,033	570	570	61,888	95,841	N/A	N/A
2030	10,512	2,069	4,157	5,414	4,628	6,033	684	684	61,660	95,841	N/A	N/A
2031	10,512	2,069	4,157	5,414	4,628	6,033	820	820	61,387	95,841	N/A	N/A
2032	10,512	2,069	4,157	5,414	4,628	6,033	984	984	61,059	95,841	N/A	N/A
2033	10,512	2,069	4,157	5,414	4,628	6,033	1,181	1,181	60,665	95,841	N/A	N/A
2034	10,512	2,069	4,157	5,414	4,628	6,033	1,418	1,418	60,192	95,841	N/A	N/A
2035	10,512	2,069	4,157	5,414	4,628	6,033	1,701	1,701	59,625	95,841	N/A	N/A
2036	10,512	2,069	4,157	5,414	4,628	6,033	2,041	2,041	58,945	95,841	N/A	N/A
2037	10,512	2,069	4,157	5,414	4,628	6,033	2,450	2,450	58,128	95,841	N/A	N/A
2038	10,512	2,069	4,157	5,414	4,628	6,033	2,940	2,940	57,149	95,841	N/A	N/A
2039	10,512	2,069	4,157	5,414	4,628	6,033	3,527	3,527	55,973	95,841	N/A	N/A
2040	10,512	2,069	4,157	5,414	4,628	6,033	4,233	4,233	54,562	95,841	N/A	N/A
2041	10,512	2,069	4,157	5,414	4,628	6,033	5,080	5,080	52,869	95,841	N/A	N/A
2042	10,512	2,069	4,157	5,414	4,628	6,033	6,095	6,095	50,837	95,841	N/A	N/A
2043	10,512	2,069	4,157	5,414	4,628	6,033	7,315	7,315	48,399	95,841	N/A	N/A
2044	10,512	2,069	4,157	5,414	4,628	6,033	8,777	8,777	45,473	95,841	N/A	N/A
2045	10,512	2,069	4,157	5,414	4,628	6,033	10,533	10,533	41,962	95,841	N/A	N/A
2046	10,512	2,069	4,157	5,414	4,628	6,033	12,639	12,639	37,749	95,841	N/A	N/A
2047	10,512	2,069	4,157	5,414	4,628	6,033	15,167	15,167	32,693	95,841	N/A	N/A
2048	10,512	2,069	4,157	5,414	4,628	6,033	17,053	15,665	30,310	95,841	N/A	N/A
2049	10,512	2,069	4,157	5,414	4,628	6,033	17,053	15,665	30,310	95,841	N/A	N/A
2050	10,512	2,069	4,157	5,414	4,628	6,033	17,053	15,665	30,310	95,841	N/A	N/A

Scenario 1

SERVICE LAND AREAS BY PIPE
STUDY AREA ONLY (Excludes Weatherford)
(Acres)

Pipe	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Year	A-I, J	A-I	A,C,D,G	G	A,C,D	A	C,D	D	C	B,E,F,H,I	B	E,F,H,I	E	F,H,I	F	H,I	H	I
1998	191,681	95,841	8,784	2	8,782	5,013	3,769	1,999	1,770	87,057	1,252	85,804	1,066	84,738	931	83,807	2	83,805
1999	191,681	95,841	9,863	2	9,660	5,515	4,146	2,199	1,947	86,178	1,378	84,800	1,173	83,627	1,024	82,603	2	82,601
2000	191,681	95,841	10,629	3	10,626	6,066	4,560	2,418	2,142	85,211	1,515	83,696	1,290	82,406	1,126	81,279	3	81,277
2001	191,681	95,841	11,693	3	11,689	6,673	5,016	2,660	2,358	84,148	1,667	82,481	1,419	81,062	1,239	79,823	3	79,820
2002	191,681	95,841	12,862	4	12,858	7,340	5,518	2,926	2,592	82,979	1,833	81,145	1,561	79,584	1,363	78,221	4	78,217
2003	191,681	95,841	14,149	5	14,144	8,074	6,070	3,219	2,851	81,692	2,017	79,675	1,717	77,958	1,499	76,459	5	76,454
2004	191,681	95,841	15,564	6	15,558	8,882	6,677	3,541	3,136	80,277	2,069	78,207	1,889	76,318	1,649	74,669	6	74,663
2005	191,681	95,841	17,121	7	17,114	9,770	7,344	3,895	3,449	78,720	2,069	76,650	2,078	74,572	1,814	72,758	7	72,751
2006	191,681	95,841	18,599	9	18,591	10,512	8,079	4,284	3,794	77,241	2,069	75,172	2,286	72,887	1,996	70,891	9	70,882
2007	191,681	95,841	19,392	10	19,382	10,512	8,870	4,713	4,157	76,448	2,069	74,379	2,514	71,865	2,195	69,670	10	69,659
2008	191,681	95,841	19,866	12	19,853	10,512	9,342	5,184	4,157	75,975	2,069	73,906	2,766	71,140	2,415	68,725	12	68,713
2009	191,681	95,841	20,098	15	20,084	10,512	9,572	5,414	4,157	75,742	2,069	73,673	3,042	70,631	2,656	67,975	15	67,960
2010	191,681	95,841	20,101	18	20,084	10,512	9,572	5,414	4,157	75,739	2,069	73,670	3,346	70,324	2,922	67,402	18	67,384
2011	191,681	95,841	20,105	21	20,084	10,512	9,572	5,414	4,157	75,736	2,069	73,666	3,681	69,985	3,214	66,771	21	66,750
2012	191,681	95,841	20,109	26	20,084	10,512	9,572	5,414	4,157	75,731	2,069	73,662	4,049	69,613	3,535	66,078	26	66,052
2013	191,681	95,841	20,114	31	20,084	10,512	9,572	5,414	4,157	75,728	2,069	73,657	4,454	69,203	3,889	65,314	31	65,283
2014	191,681	95,841	20,120	37	20,084	10,512	9,572	5,414	4,157	75,726	2,069	73,651	4,828	69,023	4,278	64,745	37	64,708
2015	191,681	95,841	20,128	44	20,084	10,512	9,572	5,414	4,157	75,720	2,069	73,643	4,628	69,016	4,706	64,310	44	64,266
2016	191,681	95,841	20,137	53	20,084	10,512	9,572	5,414	4,157	75,713	2,069	73,635	4,628	69,007	5,176	63,831	53	63,778
2017	191,681	95,841	20,147	64	20,084	10,512	9,572	5,414	4,157	75,704	2,069	73,635	4,628	68,996	5,694	63,303	64	63,239
2018	191,681	95,841	20,160	77	20,084	10,512	9,572	5,414	4,157	75,693	2,069	73,624	4,628	68,984	6,033	62,951	77	62,874
2019	191,681	95,841	20,176	92	20,084	10,512	9,572	5,414	4,157	75,680	2,069	73,611	4,628	68,968	6,033	62,936	92	62,844
2020	191,681	95,841	20,194	110	20,084	10,512	9,572	5,414	4,157	75,665	2,069	73,596	4,628	68,950	6,033	62,917	110	62,807
2021	191,681	95,841	20,216	132	20,084	10,512	9,572	5,414	4,157	75,647	2,069	73,577	4,628	68,928	6,033	62,895	132	62,763
2022	191,681	95,841	20,243	159	20,084	10,512	9,572	5,414	4,157	75,625	2,069	73,555	4,628	68,901	6,033	62,869	159	62,710
2023	191,681	95,841	20,274	191	20,084	10,512	9,572	5,414	4,157	75,598	2,069	73,529	4,628	68,869	6,033	62,837	191	62,646
2024	191,681	95,841	20,312	229	20,084	10,512	9,572	5,414	4,157	75,566	2,069	73,497	4,628	68,831	6,033	62,799	229	62,570
2025	191,681	95,841	20,358	275	20,084	10,512	9,572	5,414	4,157	75,528	2,069	73,459	4,628	68,785	6,033	62,753	275	62,478
2026	191,681	95,841	20,413	330	20,084	10,512	9,572	5,414	4,157	75,482	2,069	73,413	4,628	68,730	6,033	62,698	330	62,368
2027	191,681	95,841	20,479	396	20,084	10,512	9,572	5,414	4,157	75,427	2,069	73,358	4,628	68,665	6,033	62,632	396	62,236
2028	191,681	95,841	20,558	475	20,084	10,512	9,572	5,414	4,157	75,382	2,069	73,292	4,628	68,585	6,033	62,553	475	62,078
2029	191,681	95,841	20,653	570	20,084	10,512	9,572	5,414	4,157	75,282	2,069	73,213	4,628	68,490	6,033	62,458	570	61,888
2030	191,681	95,841	20,767	684	20,084	10,512	9,572	5,414	4,157	75,187	2,069	73,118	4,628	68,377	6,033	62,344	684	61,660
2031	191,681	95,841	20,904	820	20,084	10,512	9,572	5,414	4,157	75,074	2,069	73,004	4,628	68,240	6,033	62,207	820	61,387
2032	191,681	95,841	21,068	984	20,084	10,512	9,572	5,414	4,157	74,937	2,069	72,867	4,628	68,076	6,033	62,043	984	61,059
2033	191,681	95,841	21,265	1,181	20,084	10,512	9,572	5,414	4,157	74,773	2,069	72,703	4,628	67,879	6,033	61,846	1,181	60,665
2034	191,681	95,841	21,501	1,418	20,084	10,512	9,572	5,414	4,157	74,576	2,069	72,506	4,628	67,643	6,033	61,610	1,418	60,192
2035	191,681	95,841	21,785	1,701	20,084	10,512	9,572	5,414	4,157	74,340	2,069	72,270	4,628	67,359	6,033	61,327	1,701	59,625
2036	191,681	95,841	22,125	2,041	20,084	10,512	9,572	5,414	4,157	74,056	2,069	71,987	4,628	67,019	6,033	60,986	2,041	58,945
2037	191,681	95,841	22,533	2,450	20,084	10,512	9,572	5,414	4,157	73,716	2,069	71,646	4,628	66,611	6,033	60,578	2,450	58,128
2038	191,681	95,841	23,023	2,940	20,084	10,512	9,572	5,414	4,157	73,308	2,069	71,238	4,628	66,121	6,033	60,088	2,940	57,149
2039	191,681	95,841	23,611	3,527	20,084	10,512	9,572	5,414	4,157	72,818	2,069	70,748	4,628	65,533	6,033	59,500	3,527	55,973
2040	191,681	95,841	24,316	4,233	20,084	10,512	9,572	5,414	4,157	72,230	2,069	70,160	4,628	64,827	6,033	58,795	4,233	54,562
2041	191,681	95,841	25,163	5,080	20,084	10,512	9,572	5,414	4,157	71,524	2,069	69,455	4,628	63,981	6,033	57,948	5,080	52,869
2042	191,681	95,841	26,179	6,095	20,084	10,512	9,572	5,414	4,157	70,678	2,069	68,608	4,628	62,965	6,033	56,932	6,095	50,837
2043	191,681	95,841	27,398	7,315	20,084	10,512	9,572	5,414	4,157	69,662	2,069	67,592	4,628	61,746	6,033	55,713	7,315	48,399
2044	191,681	95,841	28,861	8,777	20,084	10,512	9,572	5,414	4,157	68,443	2,069	66,373	4,628	60,283	6,033	54,250	8,777	45,473
2045	191,681	95,841	30,616	10,533	20,084	10,512	9,572	5,414	4,157	66,980	2,069	64,910	4,628	58,527	6,033	52,495	10,533	41,962
2046	191,681	95,841	32,723	12,639	20,084	10,512	9,572	5,414	4,157	65,224	2,069	63,155	4,628	56,421	6,033	50,388	12,639	37,749
2047	191,681	95,841	35,251	15,167	20,084	10,512	9,572	5,414	4,157	63,118	2,069	61,048	4,628	53,893	6,033	47,860	15,167	32,693
2048	191,681	95,841	37,137	17,053	20,084	10,512	9,572	5,414	4,157	60,590	2,069	58,520	4,628	52,007	6,033	45,974	15,665	30,310
2049	191,681	95,841	37,137	17,053	20,084	10,512	9,572	5,414	4,157	58,704	2,069	56,635	4,628	52,007	6,033	45,974	15,665	30,310
2050	191,681	95,841	37,137	17,053	20,084	10,512	9,572	5,414	4,157	58,704	2,069	56,635	4,628	52,007	6,033	45,974	15,665	30,310

Scenario 1

**WELL DEMAND BY ENTITY
(Excludes Weatherford)**
(Number of wells)

Current Wells	18	6	21	0	2	1	48
Current Capacity, avg (mgd)	1.05	0.35	1.06	0.00	0.29	0.19	2.93
Current Capacity, max (mgd)	1.23	0.44	1.57	0.00	0.32	0.24	3.81
Utilization Ratio	85.00%	78.51%	67.66%	0.00%	88.58%	78.57%	77.00%
Average New Well (gpm)	142	142	42	42	142	142	
Average New Well (mgd)	0.20	0.20	0.06	0.06	0.20	0.20	
New Well Aquifer	Trinity	Trinity	Paluxy	Paluxy	Trinity	Trinity	

Year	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta (Deer Creek)	Annetta South	Total
1998	18	6	21	2	2	1	50
1999	18	6	21	2	2	1	50
2000	18	6	21	2	2	1	50
2001	18	6	21	2	2	1	50
2002	18	6	21	2	2	1	50
2003	18	6	21	2	2	1	50
2004	18	6	21	2	2	1	51
2005	18	7	21	2	2	1	51
2006	18	7	21	2	2	1	51
2007	18	7	21	2	2	1	51
2008	18	7	21	2	2	1	51
2009	18	7	21	2	2	1	52
2010	18	7	21	2	2	1	52
2011	19	7	21	3	2	1	53
2012	19	7	21	3	2	1	53
2013	19	7	21	3	2	1	54
2014	19	8	21	3	3	1	54
2015	20	8	21	3	3	1	55
2016	20	8	21	3	3	1	56
2017	20	8	21	3	3	1	56
2018	20	8	21	3	3	1	57
2019	21	8	21	3	3	1	58
2020	21	8	23	4	3	1	60
2021	21	8	25	4	3	2	63
2022	22	9	27	4	3	2	66
2023	22	9	30	4	3	2	69
2024	22	9	32	4	3	2	73
2025	23	9	35	4	4	2	76
2026	23	9	38	4	4	2	80
2027	23	10	41	4	4	2	84
2028	24	10	44	5	4	2	88
2029	24	10	45	5	4	2	89
2030	24	10	45	5	4	2	90
2031	25	10	45	5	4	2	91
2032	25	11	45	5	4	2	92
2033	26	11	45	5	5	2	93
2034	26	11	45	6	5	3	95
2035	27	11	45	6	5	3	96
2036	27	11	45	6	5	3	97
2037	28	11	45	6	5	3	98
2038	28	11	45	6	5	3	99
2039	29	11	45	7	5	3	100
2040	29	11	45	7	6	3	101
2041	30	11	45	7	6	3	102
2042	31	11	45	7	6	3	103
2043	31	11	45	8	6	3	104
2044	32	11	45	8	6	4	106
2045	33	11	45	8	7	4	107
2046	33	11	45	9	7	4	108
2047	34	11	45	9	7	4	110
2048	35	11	45	9	7	4	111
2049	36	11	45	9	7	4	112
2050	36	11	45	10	8	4	114

Scenario 1

PARTIALLY ENCUMBERED PROPERTY PER ENTITY
(Excludes Weatherford)
 (Acres 500' Well Radius)

Acres Per Well = 18.03

Year	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta (Deer Creek)	Annetta South	Total
1998	325	108	379	30	36	18	895
1999	325	109	379	31	36	18	898
2000	325	111	379	32	36	18	900
2001	325	112	379	33	36	18	902
2002	325	114	379	34	36	18	905
2003	325	115	379	35	36	18	908
2004	325	117	379	37	36	18	911
2005	325	118	379	38	36	18	913
2006	325	120	379	39	37	18	917
2007	325	122	379	41	38	18	921
2008	325	123	379	42	39	18	926
2009	327	125	379	44	40	18	933
2010	331	127	379	45	41	18	942
2011	335	129	379	47	42	19	951
2012	339	131	379	48	44	20	961
2013	343	133	379	50	45	21	971
2014	348	135	379	52	46	21	981
2015	352	138	379	53	48	22	992
2016	357	140	379	55	49	23	1,003
2017	362	142	379	57	50	24	1,014
2018	367	145	379	59	52	25	1,026
2019	372	147	383	61	53	26	1,042
2020	377	150	417	63	55	27	1,089
2021	382	153	454	66	57	28	1,140
2022	388	156	494	68	58	29	1,193
2023	394	159	537	70	60	30	1,250
2024	400	162	582	73	62	31	1,310
2025	406	165	631	75	64	32	1,374
2026	413	168	684	78	66	34	1,442
2027	420	171	741	80	68	35	1,515
2028	426	175	801	83	70	36	1,592
2029	434	179	803	86	72	38	1,611
2030	441	182	803	89	74	39	1,628
2031	449	186	803	92	77	41	1,647
2032	457	190	803	95	79	42	1,666
2033	465	194	803	99	81	44	1,685
2034	473	198	803	102	84	45	1,706
2035	482	201	803	106	87	47	1,724
2036	491	201	803	109	89	49	1,742
2037	500	201	803	113	92	50	1,759
2038	510	201	803	117	95	52	1,778
2039	520	201	803	121	98	54	1,797
2040	530	201	803	125	101	56	1,816
2041	541	201	803	130	105	58	1,837
2042	552	201	803	134	108	60	1,858
2043	564	201	803	139	112	63	1,880
2044	575	201	803	144	115	65	1,902
2045	588	201	803	149	119	67	1,925
2046	600	201	803	154	123	70	1,950
2047	613	201	803	159	127	72	1,974
2048	627	201	803	165	131	75	2,000
2049	641	201	803	170	135	77	2,027
2050	655	201	803	176	140	80	2,055

Scenario 1							
SANITARY CONTROL EASEMENT REQUIRED (Excludes Weatherford) (Acres)							
Acres per Well = 1.62							
Year	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta South (Deer Creek)	Annetta South	Total
1998	29	10	34	3	3	2	81
1999	29	10	34	3	3	2	81
2000	29	10	34	3	3	2	81
2001	29	10	34	3	3	2	81
2002	29	10	34	3	3	2	81
2003	29	10	34	3	3	2	82
2004	29	10	34	3	3	2	82
2005	29	11	34	3	3	2	82
2006	29	11	34	4	3	2	83
2007	29	11	34	4	3	2	83
2008	29	11	34	4	4	2	83
2009	29	11	34	4	4	2	84
2010	30	11	34	4	4	2	85
2011	30	12	34	4	4	2	86
2012	31	12	34	4	4	2	86
2013	31	12	34	4	4	2	87
2014	31	12	34	5	4	2	88
2015	32	12	34	5	4	2	89
2016	32	13	34	5	4	2	90
2017	33	13	34	5	5	2	91
2018	33	13	34	5	5	2	92
2019	33	13	34	6	5	2	94
2020	34	14	38	6	5	2	98
2021	34	14	41	6	5	3	103
2022	35	14	44	6	5	3	107
2023	35	14	48	6	5	3	112
2024	36	15	52	7	6	3	118
2025	37	15	57	7	6	3	124
2026	37	15	62	7	6	3	130
2027	38	15	67	7	6	3	136
2028	38	16	72	7	6	3	143
2029	39	16	72	8	6	3	145
2030	40	16	72	8	7	4	147
2031	40	17	72	8	7	4	148
2032	41	17	72	9	7	4	150
2033	42	17	72	9	7	4	152
2034	43	18	72	9	8	4	154
2035	43	18	72	10	8	4	155
2036	44	18	72	10	8	4	157
2037	45	18	72	10	8	5	158
2038	46	18	72	11	9	5	160
2039	47	18	72	11	9	5	162
2040	48	18	72	11	9	5	163
2041	49	18	72	12	9	5	165
2042	50	18	72	12	10	5	167
2043	51	18	72	12	10	6	169
2044	52	18	72	13	10	6	171
2045	53	18	72	13	11	6	173
2046	54	18	72	14	11	6	175
2047	55	18	72	14	11	6	178
2048	56	18	72	15	12	7	180
2049	58	18	72	15	12	7	182
2050	59	18	72	16	13	7	185

APPENDIX L - OPTION 3, SCENARIO 1

(This is only a partial printout of some of the more important sheets in the spreadsheet. For the rest of this scenario, or a scenario of your own, please use the spreadsheet in Appendix N.)

Input Run
Input Cities
Input Pipe
Input Cost
Treatment Chart
Construction Summary
Total Cost Summary
Treatment Chart Data
Cost Table
Actual Average Demand By Entity
Actual Design Demand By Entity
Raw Water Purchase Costs
Raw Water Transportation Costs
Treatment Costs
Storage and Pumping Costs
Pipe 1 Costs
Pipe 2 Costs
Pipe 3 Costs
Pipe 4 Costs
Pipe 5 Costs
Pipe 6 Costs
Pipe 7 Costs
Pipe 8 Costs
Pipe 9 Costs
Pipe 10 Costs
Pipe 11 Costs
Pipe 12 Costs
Pipe 13 Costs
Pipe 14 Costs
Pipe 15 Costs
Pipe 16 Costs
Pipe 17 Costs
Pipe 18 Costs
Willow Park Total Costs
Aledo Total Costs
Hudson Oaks Total Costs
Annetta North Total Costs
Annetta Total Costs
Annetta South Total Costs
Fort Worth North ETJ Total Costs
Fort Worth South ETJ Total Costs
Unincorporated Water Systems Total Costs
Weatherford Total Costs
Total Cost Annual Cost By Entity
Total Cost Added Monthly Rate By Entity
Capital Cost Summary
Capital Cost Annual Cost By Entity
Capital Cost Added Monthly Rate By Entity

Scenario 1

GENERAL INFORMATION FOR THIS RUN

Run Name	<i>Scenario 1</i>
Cost Basis	(All cost amounts shown are in current Dollars)
Cost Year	\$ 1999
Years for Facility Use Averaging	20

Run Description:

Areas Served:	All of Study Area with staged implementation
Raw Water Transmission:	Cost share with Weatherford line (to plant)
Size of Initial Raw Water Line:	36"
Year of Initial Plant Operation:	2005
Size of Initial Plant:	2 MGD
Size of Initial Treated Water Exit Pipe:	10"
Initial Areas Served:	Aledo, Willow Park, Hudson Oaks

Scenario 1

INPUT DATA

Entity	Annexation				Construction				Year To Take Wells Off-Line	Inflation Rate (%)	Interest Rate (%)	Loan Term (years)		
	Code	Area Growth Rate Per Year	Population Growth Rate Per Year	Maximum Population Density Per Acre	Population Curve Approximates	Average Demand Per Connection (gpm)	Based On	Construction Design Demand Per Connection (gpm)					Based On	Year To Start Regional Service
Willow Park	A	10.00%	3.40%	2.5	TWDB High	0.32	TWDB Avg.	0.6	TNRCC	2005	2010	4.50%	6.00%	20
Alledo	B	10.00%	3.40%	2.5	TWDB High	0.32	TWDB Avg.	0.6	TNRCC	2005	2010	4.50%	6.00%	20
Hudson Oaks	C	10.00%	7.31%	2.5	8yr COG	0.32	TWDB Avg.	0.6	TNRCC	2005	2010	4.50%	6.00%	20
Annetta North	D	10.00%	3.47%	2.5	8yr COG	0.32	TWDB Avg.	0.6	TNRCC	2015	1998	4.50%	6.00%	20
Annetta	E	10.00%	3.47%	2.5	8yr COG	0.32	TWDB Avg.	0.6	TNRCC	2015	1998	4.50%	6.00%	20
Annetta South	F	10.00%	3.47%	2.5	8yr COG	0.32	TWDB Avg.	0.6	TNRCC	2015	1998	4.50%	6.00%	20
Fort Worth ETJ North	G	20.00%	1.15%	2.5	TWDB High	0.32	TWDB Avg.	0.6	TNRCC	2020	1998	4.50%	6.00%	20
Fort Worth ETJ South	H	20.00%	1.15%	2.5	TWDB High	0.32	TWDB Avg.	0.6	TNRCC	2020	1998	4.50%	6.00%	20
Non-Municipal Water Utility SE Parker County	I	N/A	2.80%	2.5	8yr COG	0.32	TWDB Avg.	0.6	TNRCC	2025	1998	4.50%	6.00%	20
Weatherford	J	10.00%	3.10%	2.5	TWDB High	0.32	TWDB Avg.	0.6	TNRCC	2000	1998	4.50%	6.00%	20

Scenario 1

PIPE DATA

Pipe	Length (ft)	Row Width (ft)	Land Cost (\$/ft)	Start Building (year)	Initial Use (year)
1	57,000	20	\$22.00	2000	2000
2	1,470	20	\$22.00	2003	2005
3	3,680	15	\$16.50	2003	2005
4	26,250	15	\$16.50	2018	2020
5	310	15	\$16.50	2003	2005
6	310	15	\$16.50	2003	2005
7	12,970	15	\$16.50	2003	2005
8	4,910	15	\$16.50	2013	2015
9	6,660	15	\$16.50	2003	2005
10	2,820	15	\$16.50	2003	2005
11	2,080	15	\$16.50	2003	2005
12	1,480	15	\$16.50	2013	2015
13	10,690	15	\$16.50	2013	2015
14	3,190	15	\$16.50	2013	2015
15	6,660	15	\$16.50	2013	2015
16	37,910	15	\$16.50	2018	2020
17	6,400	15	\$16.50	2018	2020
18	17,880	15	\$16.50	2023	2025

Scenario 1

UNIT COST SUMMARY

Costs in 1998 Dollars

Note! Unit Costs include construction, engr, survey, legal, and admin.

Item	Unit	Total Unit Cost
Raw Water Purchase Rate	1000 gal	\$0.62
TRWD System Buy-in Cost	MGD Capacity	\$200,000.00
Intake Structure, 12 MGD	Each	\$472,500.00
Water Pump Station & Pumps	GPM Capacity	\$202.50
O&M, Pump Station	1000 gal	\$0.05
0.5 MGD Treatment Plant	Each	\$945,000.00
1.0 MGD Treatment Plant	Each	\$1,755,000.00
2.0 MGD Treatment Plant	Each	\$3,375,000.00
4.0 MGD Treatment Plant	Each	\$5,400,000.00
6.0 MGD Treatment Plant	Each	\$7,425,000.00
O&M, Treatment Plant	Gallon	\$0.08
Ground Storage Tank	Gallon	\$0.95
Elevated Storage Tank	Gallon	\$1.49
O&M, Storage Tank	Gallon	\$0.01
6" PVC Water Line and Fittings	L.F.	\$54.00
8" PVC Water Line and Fittings	L.F.	\$60.75
10" PVC Water Line and Fittings	L.F.	\$64.80
12" PVC Water Line and Fittings	L.F.	\$74.25
16" DIP/CYL Water Line and Fittings	L.F.	\$87.75
20" DIP/CYL Water Line and Fittings	L.F.	\$108.00
24" DIP/CYL Water Line and Fittings	L.F.	\$128.25
30" DIP/CYL Water Line and Fittings	L.F.	\$141.75
36" DIP/CYL Water Line and Fittings	L.F.	\$155.25
36" DIP/CYL Water Line Reimbursement	L.F.	\$112.05
O&M, Pipe Lines	L.F.	\$0.25
Purchase Site	Acre	\$16,500.00
Purchase 20' ROW	L.F.	\$27.50
15' Easement	L.F.	\$16.50
20' Easement	L.F.	\$22.00
No Cost Item		\$0.00

GENERAL UNIT PRICES USED FOR STUDY

(All cost amounts shown are in current Dollars)

Type	Item No.	Item	Unit	Total Unit Cost	Construction Unit Costs					Land Unit Costs			TOTAL Unit Cost
					Raw Construction Unit Cost	Contingency 15%	Engineering 10%	Surveying 7%	Lgl/Admny/Finance 3%	Raw Land Purchase Unit Cost	Easement Unit Cost	Engr & Finance 10%	
Intake Pumping	1	Intake Structure, Utilize Existing	Each	\$81,000.00	\$60,000.00	\$9,000.00	\$6,000.00	\$4,200.00	\$1,800.00				\$81,000.00
Pumping	2	Intake Structure Pumping	GPM	\$202.50	\$150.00	\$22.50	\$15.00	\$10.50	\$4.50				\$202.50
Pumping	3	Raw Water Boosters	GPM	\$202.50	\$150.00	\$22.50	\$15.00	\$10.50	\$4.50				\$202.50
Treatment	4	0.5 MGD Treatment Plant	Each	\$945,000.00	\$700,000.00	\$105,000.00	\$70,000.00	\$49,000.00	\$21,000.00				\$945,000.00
Treatment	5	1.0 MGD Treatment Plant	Each	\$1,755,000.00	\$1,300,000.00	\$195,000.00	\$130,000.00	\$91,000.00	\$39,000.00				\$1,755,000.00
Raw Water Transmission:	6	2.0 MGD Treatment Plant	Each	\$3,375,000.00	\$2,500,000.00	\$375,000.00	\$250,000.00	\$175,000.00	\$75,000.00				\$3,375,000.00
Treatment	7	4.0 MGD Treatment Plant	Each	\$5,400,000.00	\$4,000,000.00	\$600,000.00	\$400,000.00	\$280,000.00	\$120,000.00				\$5,400,000.00
Treatment	8	6.0 MGD Treatment Plant	Each	\$7,425,000.00	\$5,500,000.00	\$825,000.00	\$550,000.00	\$385,000.00	\$165,000.00				\$7,425,000.00
Pumping	9	Treated Water Boosters	GPM	\$202.50	\$150.00	\$22.50	\$15.00	\$10.50	\$4.50				\$202.50
Storage	10	Ground Storage Tank	Gallon	\$0.95	\$0.70	\$0.11	\$0.07	\$0.05	\$0.02				\$0.95
Storage	11	Elevated Storage Tank	Gallon	\$1.49	\$1.10	\$0.17	\$0.11	\$0.08	\$0.03				\$1.49
Piping	12	6" PVC Water Line and Fittings	L.F.	\$54.00	\$40.00	\$6.00	\$4.00	\$2.80	\$1.20				\$54.00
Piping	13	8" PVC Water Line and Fittings	L.F.	\$60.75	\$45.00	\$6.75	\$4.50	\$3.15	\$1.35				\$60.75
Piping	14	10" PVC Water Line and Fittings	L.F.	\$64.80	\$48.00	\$7.20	\$4.80	\$3.36	\$1.44				\$64.80
Piping	15	12" PVC Water Line and Fittings	L.F.	\$74.25	\$55.00	\$8.25	\$5.50	\$3.85	\$1.65				\$74.25
Piping	16	16" DIP/CYL Water Line and Fittings	L.F.	\$87.75	\$65.00	\$9.75	\$6.50	\$4.55	\$1.95				\$87.75
Piping	17	20" DIP/CYL Water Line and Fittings	L.F.	\$108.00	\$80.00	\$12.00	\$8.00	\$5.60	\$2.40				\$108.00
Piping	18	24" DIP/CYL Water Line and Fittings	L.F.	\$128.25	\$95.00	\$14.25	\$9.50	\$6.65	\$2.85				\$128.25
Piping	19	30" DIP/CYL Water Line and Fittings	L.F.	\$141.75	\$105.00	\$15.75	\$10.50	\$7.35	\$3.15				\$141.75
Piping	20	36" DIP/CYL Water Line and Fittings	L.F.	\$155.25	\$115.00	\$17.25	\$11.50	\$8.05	\$3.45				\$155.25
Piping	21	36" DIP/CYL Water Line Reimbursement	L.F.	\$112.05	\$83.00	\$12.45	\$8.30	\$5.81	\$2.49				\$112.05
Land	22	Purchase Site	Acre	\$16,500.00						\$15,000.00			\$16,500.00
Land	23	Purchase 20' ROW	L.F.	\$27.50						\$25.00			\$27.50
Land	24	15' Easement	L.F.	\$16.50						\$15.00			\$16.50
Land	25	20' Easement	L.F.	\$22.00						\$20.00			\$22.00
Intake Pumping	30	Intake Structure, Build New	Each	\$472,500.00	\$350,000.00	\$52,500.00	\$35,000.00	\$24,500.00	\$10,500.00				\$472,500.00
Pumping	31	Pump Station, Build New	Each	\$243,000.00	\$180,000.00	\$27,000.00	\$18,000.00	\$12,600.00	\$5,400.00				\$243,000.00
Null	99	No Cost Item		\$0.00	\$0.00								\$0.00

ANNUAL WATER PURCHASE AND IMPROVEMENT SUMMARY

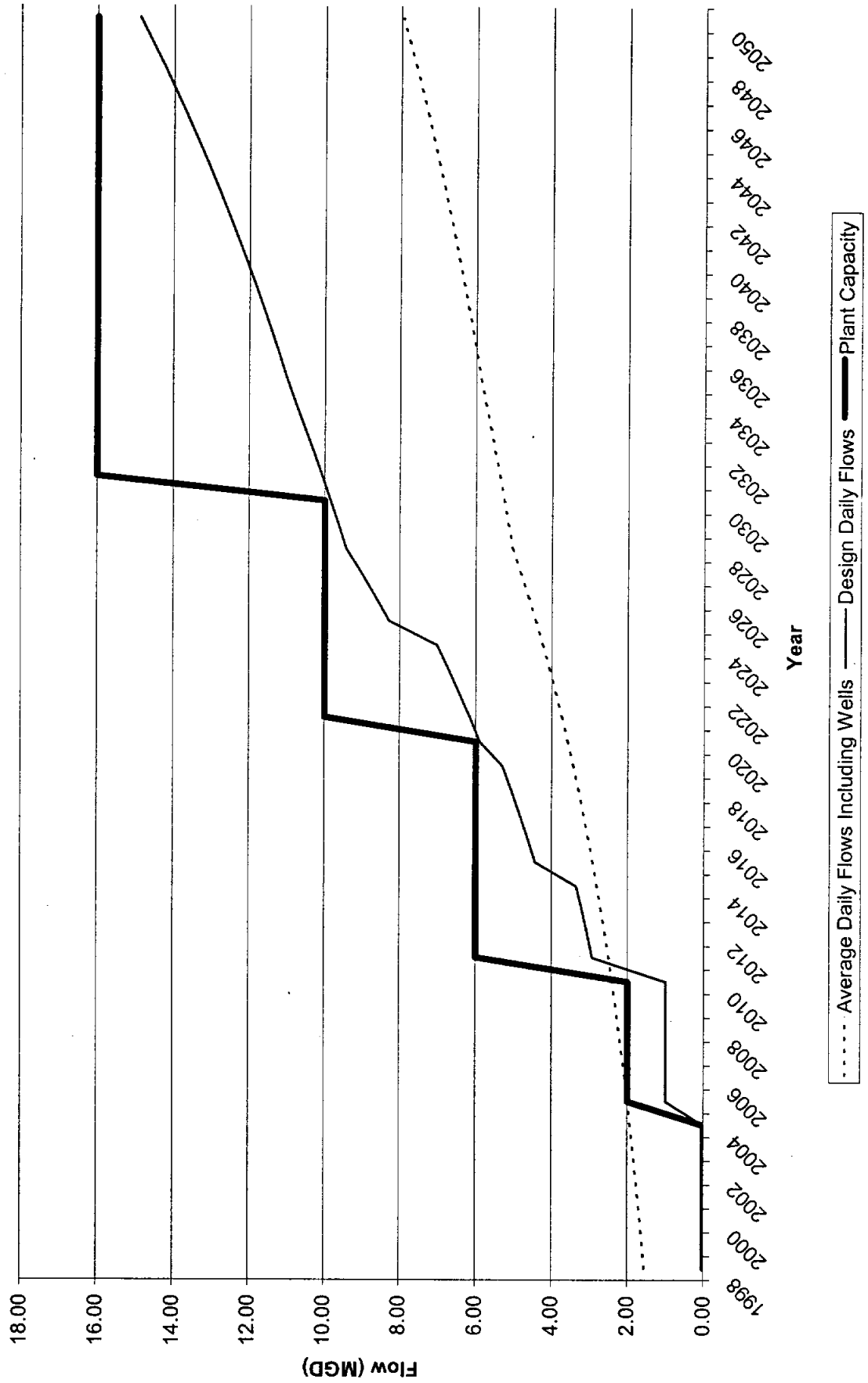
Year	Raw Water Purchase W/ord	Raw Water Purchase SEPC	Raw Water Intake Capacity Upgrade	Raw Water Pumping Upgrade	Treatment Plant Upgrade	Storage Upgrade	Pumping Upgrade	Pipe 1 Upgrade	Pipe 2 Upgrade	Pipe 3 Upgrade	Pipe 4 Upgrade	Pipe 5 Upgrade	Pipe 6 Upgrade	Pipe 7 Upgrade	Pipe 8 Upgrade	Pipe 9 Upgrade	Pipe 10 Upgrade	Pipe 11 Upgrade	Pipe 12 Upgrade	Pipe 13 Upgrade	Pipe 14 Upgrade	Pipe 15 Upgrade	Pipe 16 Upgrade	Pipe 17 Upgrade	Pipe 18 Upgrade			
	1000 gal	1000 gal	MGD	gpm	MGD	gal	gpm	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)	(in. dia.)			
1998																												
1999																												
2000	2,111,792		12	10,000				36																				
2001	2,177,257																											
2002	2,244,752																											
2003	2,314,340																											
2004	2,386,084																											
2005	2,460,053	438,590			2	2,500,000	5,000		10	10																		
2006	2,536,314	457,993																										
2007	2,614,940	478,384																										
2008	2,696,003	498,821																										
2009	2,778,579	522,364																										
2010	2,865,746	548,080																										
2011	2,954,584	571,037			4	2,500,000																						
2012	3,046,177	597,310																										
2013	3,140,608	624,977																										
2014	3,237,967	654,123	12																									
2015	3,338,344	683,727																										
2016	3,441,832	713,313																										
2017	3,548,529	742,979		10,000		2,500,000				16																		
2018	3,658,534	773,543																										
2019	3,771,948	804,110																										
2020	3,888,879	834,678			4						6																	
2021	4,009,434	865,246																										
2022	4,133,726	895,814																										
2023	4,261,872	926,382																										
2024	4,393,990	956,950																										
2025	4,530,204	987,518				2,500,000	5,000																					
2026	4,670,840	1,018,086																										
2027	4,815,430	1,048,654																										
2028	4,964,708	1,079,222																										
2029	5,118,614	1,109,790																										
2030	5,277,291	1,140,358																										
2031	5,440,887	1,170,926	12																									
2032	5,609,554	1,201,494																										
2033	5,783,451	1,232,062																										
2034	5,962,738	1,262,630																										
2035	6,147,563	1,293,198																										
2036	6,338,158	1,323,766																										
2037	6,534,640	1,354,334																										
2038	6,737,214	1,384,902																										
2039	6,946,068	1,415,470																										
2040	7,161,396	1,446,038																										
2041	7,383,399	1,476,606																										
2042	7,612,285	1,507,174																										
2043	7,848,268	1,537,742																										
2044	8,091,562	1,568,310																										
2045	8,342,400	1,598,878																										
2046	8,601,015	1,629,446																										
2047	8,867,646	1,659,014																										
2048	9,142,543	1,688,582																										
2049	9,425,982	1,718,150																										
2050	9,718,167	1,747,718																										

Scenario 1

TREATMENT PLANT USE AND UPGRADES

Water Transm	Total Average Daily Flows (MGD)	Expected Design Plant Flows (MGD)	Plant Capacity (MGD)
Year			
1998	1.56	0.00	0.00
1999	1.61	0.00	0.00
2000	1.67	0.00	0.00
2001	1.73	0.00	0.00
2002	1.79	0.00	0.00
2003	1.86	0.00	0.00
2004	1.93	0.00	0.00
2005	2.00	1.00	2.00
2006	2.08	1.00	2.00
2007	2.16	1.00	2.00
2008	2.24	1.00	2.00
2009	2.32	1.00	2.00
2010	2.41	1.00	2.00
2011	2.51	2.93	6.00
2012	2.61	3.07	6.00
2013	2.71	3.21	6.00
2014	2.82	3.36	6.00
2015	2.93	4.44	6.00
2016	3.05	4.64	6.00
2017	3.17	4.84	6.00
2018	3.30	5.06	6.00
2019	3.44	5.29	6.00
2020	3.58	5.89	6.00
2021	3.73	6.15	10.00
2022	3.89	6.43	10.00
2023	4.06	6.71	10.00
2024	4.23	7.02	10.00
2025	4.42	8.28	10.00
2026	4.61	8.65	10.00
2027	4.81	9.03	10.00
2028	5.03	9.43	10.00
2029	5.14	9.64	10.00
2030	5.25	9.85	10.00
2031	5.37	10.07	16.00
2032	5.49	10.30	16.00
2033	5.62	10.53	16.00
2034	5.74	10.77	16.00
2035	5.86	10.99	16.00
2036	5.97	11.20	16.00
2037	6.09	11.41	16.00
2038	6.20	11.63	16.00
2039	6.32	11.86	16.00
2040	6.45	12.09	16.00
2041	6.58	12.33	16.00
2042	6.71	12.58	16.00
2043	6.85	12.84	16.00
2044	6.99	13.10	16.00
2045	7.14	13.38	16.00
2046	7.29	13.66	16.00
2047	7.44	13.96	16.00
2048	7.60	14.26	16.00
2049	7.77	14.57	16.00
2050	7.94	14.89	16.00

Treatment Plant Expansion



Scenario 1

TOTAL COST SUMMARY DATA
(Includes Capital, Operation and Maintenance)
(All cost amounts shown are in current Dollars)

Year	A Willow Park	B Aledo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	Total	J W'ford (excluding raw water)	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$447,437	\$256,606	\$356,790	\$28,807	\$73,051	\$45,983	\$0	\$0	\$0	\$1,208,673	\$7,357,411	\$8,566,084
2001	\$9,900	\$5,601	\$8,038	\$693	\$1,758	\$1,107	\$147	\$64	\$0	\$27,309	\$106,893	\$134,202
2002	\$10,744	\$6,009	\$8,890	\$803	\$2,036	\$1,282	\$288	\$126	\$0	\$30,177	\$107,161	\$137,338
2003	\$119,491	\$107,823	\$402,178	\$27,248	\$26,480	\$16,668	\$4,092	\$2,121	\$0	\$706,101	\$107,525	\$813,626
2004	\$12,425	\$6,824	\$10,704	\$1,020	\$2,585	\$1,627	\$556	\$242	\$0	\$35,985	\$107,980	\$143,965
2005	\$3,424,713	\$2,116,142	\$2,869,830	\$129,944	\$313,650	\$197,432	\$74,313	\$32,690	\$0	\$9,158,714	\$112,482	\$9,271,196
2006	\$154,129	\$84,039	\$140,677	\$12,653	\$31,247	\$19,669	\$7,818	\$3,400	\$4,816	\$458,447	\$114,034	\$572,481
2007	\$156,381	\$83,424	\$145,696	\$13,497	\$33,381	\$21,012	\$8,658	\$3,765	\$9,218	\$475,032	\$115,731	\$590,763
2008	\$158,989	\$83,301	\$151,264	\$14,285	\$35,376	\$22,268	\$9,449	\$4,110	\$13,314	\$492,356	\$117,571	\$609,927
2009	\$161,900	\$83,546	\$157,363	\$15,047	\$37,306	\$23,483	\$10,204	\$4,438	\$17,182	\$510,468	\$119,550	\$630,018
2010	\$165,336	\$84,213	\$163,346	\$15,825	\$39,274	\$24,722	\$10,950	\$4,763	\$20,917	\$529,368	\$121,746	\$651,092
2011	\$3,509,949	\$1,762,762	\$3,213,539	\$312,574	\$791,778	\$498,396	\$182,624	\$79,660	\$338,053	\$10,689,333	\$146,912	\$10,836,246
2012	\$246,700	\$124,132	\$247,366	\$25,148	\$62,888	\$39,586	\$18,098	\$7,881	\$38,435	\$810,233	\$150,021	\$960,254
2013	\$251,534	\$126,562	\$257,099	\$108,038	\$253,698	\$180,353	\$19,973	\$14,731	\$77,627	\$1,289,616	\$153,339	\$1,442,955
2014	\$308,292	\$155,065	\$320,252	\$34,728	\$87,138	\$54,850	\$26,433	\$11,516	\$61,813	\$1,060,088	\$451,333	\$1,511,421
2015	\$329,391	\$165,662	\$462,273	\$82,346	\$191,207	\$132,587	\$29,774	\$16,574	\$93,366	\$1,503,179	\$171,003	\$1,674,182
2016	\$332,444	\$167,028	\$418,458	\$40,314	\$100,980	\$63,845	\$31,577	\$13,847	\$80,587	\$1,249,079	\$175,673	\$1,424,753
2017	\$561,093	\$280,854	\$596,141	\$67,038	\$168,746	\$106,490	\$55,879	\$24,448	\$153,858	\$2,014,548	\$1,423,335	\$3,437,883
2018	\$1,472,182	\$723,859	\$1,537,943	\$173,038	\$429,207	\$270,430	\$585,260	\$251,179	\$806,964	\$6,250,063	\$185,857	\$6,435,920
2019	\$374,721	\$185,665	\$400,434	\$45,334	\$113,697	\$71,819	\$40,038	\$17,535	\$115,040	\$1,364,283	\$191,394	\$1,555,677
2020	\$410,790	\$201,879	\$437,463	\$49,585	\$124,469	\$78,591	\$209,316	\$96,465	\$409,134	\$2,017,691	\$201,208	\$2,218,899
2021	\$2,135,355	\$1,034,551	\$2,222,789	\$261,538	\$636,580	\$400,940	\$233,810	\$100,297	\$763,868	\$7,779,728	\$207,577	\$7,987,305
2022	\$444,721	\$214,052	\$465,987	\$53,632	\$134,708	\$85,024	\$53,404	\$21,527	\$170,963	\$1,644,018	\$214,294	\$1,858,312
2023	\$463,916	\$220,479	\$479,746	\$55,922	\$140,500	\$88,665	\$54,345	\$21,880	\$481,130	\$2,006,583	\$221,376	\$2,227,959
2024	\$484,727	\$227,139	\$493,085	\$58,406	\$146,781	\$92,613	\$55,385	\$22,282	\$202,140	\$1,782,557	\$228,843	\$2,011,400
2025	\$1,808,249	\$884,772	\$1,979,054	\$213,256	\$539,437	\$339,772	\$198,677	\$84,749	\$921,053	\$6,969,017	\$247,245	\$7,216,262
2026	\$602,509	\$273,442	\$587,356	\$72,327	\$182,044	\$114,807	\$64,655	\$26,265	\$261,671	\$2,185,076	\$256,278	\$2,441,354
2027	\$642,449	\$300,489	\$609,743	\$77,078	\$203,867	\$128,545	\$67,134	\$28,666	\$289,975	\$2,347,946	\$265,793	\$2,613,739
2028	\$668,207	\$291,559	\$615,671	\$80,168	\$201,876	\$127,293	\$68,190	\$27,780	\$285,533	\$2,366,279	\$275,819	\$2,642,098
2029	\$691,083	\$311,576	\$615,752	\$82,925	\$209,836	\$131,675	\$68,907	\$28,079	\$293,214	\$2,432,047	\$283,969	\$2,716,016
2030	\$767,938	\$319,579	\$660,342	\$92,044	\$231,929	\$146,213	\$74,263	\$30,402	\$322,435	\$2,645,146	\$584,920	\$3,230,066
2031	\$4,366,187	\$1,819,623	\$3,720,636	\$515,788	\$1,306,447	\$822,585	\$390,702	\$168,444	\$1,768,731	\$14,879,143	\$301,008	\$15,180,152
2032	\$766,945	\$308,445	\$628,833	\$92,029	\$231,843	\$146,161	\$72,105	\$29,443	\$319,572	\$2,595,375	\$309,301	\$2,904,677
2033	\$793,569	\$313,097	\$635,363	\$94,617	\$238,392	\$150,284	\$73,215	\$29,921	\$327,347	\$2,655,805	\$317,880	\$2,973,685
2034	\$811,189	\$317,409	\$642,176	\$97,316	\$245,219	\$154,582	\$74,365	\$30,417	\$335,432	\$2,708,105	\$326,758	\$3,034,863
2035	\$832,964	\$320,601	\$647,923	\$99,921	\$251,811	\$158,731	\$75,412	\$30,868	\$343,144	\$2,761,376	\$335,654	\$3,097,030
2036	\$853,867	\$322,930	\$652,592	\$102,426	\$258,147	\$162,720	\$76,352	\$31,273	\$350,458	\$2,810,764	\$344,569	\$3,155,333
2037	\$1,109,380	\$411,434	\$830,392	\$132,633	\$334,733	\$210,929	\$96,116	\$39,889	\$449,871	\$3,615,376	\$1,625,148	\$5,240,524
2038	\$897,809	\$327,791	\$796,260	\$129,413	\$271,473	\$171,110	\$78,303	\$32,113	\$365,765	\$3,070,035	\$363,269	\$3,433,305
2039	\$920,901	\$330,325	\$667,420	\$110,463	\$278,479	\$175,521	\$79,315	\$32,548	\$373,773	\$2,968,746	\$373,074	\$3,341,820
2040	\$944,776	\$332,929	\$672,643	\$113,328	\$285,727	\$180,083	\$80,351	\$32,995	\$382,028	\$3,024,859	\$383,195	\$3,408,054
2041	\$969,463	\$335,605	\$678,009	\$116,291	\$301,015	\$189,707	\$81,413	\$34,328	\$400,644	\$3,106,476	\$393,641	\$3,500,117
2042	\$2,188,823	\$745,439	\$1,501,378	\$260,517	\$658,941	\$415,009	\$173,851	\$73,775	\$862,381	\$6,880,114	\$404,425	\$7,284,539
2043	\$1,027,951	\$344,724	\$696,309	\$123,292	\$310,941	\$195,957	\$84,317	\$34,708	\$411,177	\$3,229,376	\$415,556	\$3,644,932
2044	\$1,054,552	\$348,024	\$702,928	\$126,484	\$319,017	\$201,041	\$85,506	\$35,221	\$420,375	\$3,293,147	\$427,045	\$3,720,192
2045	\$1,137,974	\$369,535	\$746,134	\$136,403	\$344,154	\$216,864	\$90,864	\$37,553	\$451,363	\$3,530,844	\$739,554	\$4,270,398
2046	\$1,122,119	\$358,540	\$724,035	\$134,576	\$339,501	\$213,936	\$88,817	\$36,654	\$444,084	\$3,462,262	\$451,146	\$3,913,408
2047	\$1,140,072	\$358,390	\$723,723	\$136,752	\$345,000	\$217,398	\$89,250	\$36,837	\$449,763	\$3,497,185	\$463,782	\$3,960,968
2048	\$1,170,602	\$362,004	\$730,972	\$140,420	\$354,283	\$223,242	\$90,560	\$37,403	\$460,191	\$3,569,676	\$476,825	\$4,046,501
2049	\$1,580,026	\$468,097	\$969,073	\$188,993	\$465,151	\$293,030	\$118,724	\$48,418	\$599,116	\$4,730,629	\$490,288	\$5,220,917
2050	\$1,481,269	\$443,110	\$893,897	\$177,356	\$447,907	\$282,176	\$110,575	\$46,124	\$575,495	\$4,457,908	\$3,136,014	\$7,593,923

Willow Park Aledo Hudson Oaks Annetta N Annetta Annetta S FW North FW South Parker Co. Weatherford

Scenario 1

**AVERAGE DAILY DEMAND OF NEW FACILITIES BY ENTITY
(DISCONTINUE WELLS ON DATE SPECIFIED)**
(Includes Weatherford for Line 1)
(mgd)

Year to Start Regional Service	2005	2005	2005	2015	2015	2015	2020	2020	2025	2000
Year to Take Wells Off-line	2010	2010	2010	1998	1998	1998	1998	1998	1998	1998
Dependable Well Production	1.05	0.35	1.06	0.00	0.24	0.24	0.25	0.11	0.95	0.00

Year	A	B	C	D	E	F	G	H	I	Total	J	Total
	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta	Annetta South	Fort Worth North	Fort Worth South	Non-City SE Parker		W'ford	
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.09	3.09
2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18	3.18
2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.28	3.28
2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38	3.38
2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.49	3.49
2005	0.59	0.30	0.31	0.00	0.00	0.00	0.00	0.00	0.00	1.20	3.59	4.80
2006	0.61	0.31	0.34	0.00	0.00	0.00	0.00	0.00	0.00	1.25	3.71	4.96
2007	0.63	0.32	0.36	0.00	0.00	0.00	0.00	0.00	0.00	1.31	3.82	5.13
2008	0.65	0.33	0.39	0.00	0.00	0.00	0.00	0.00	0.00	1.37	3.94	5.31
2009	0.67	0.34	0.42	0.00	0.00	0.00	0.00	0.00	0.00	1.43	4.06	5.49
2010	0.70	0.35	0.45	0.00	0.00	0.00	0.00	0.00	0.00	1.50	4.19	5.68
2011	0.72	0.36	0.48	0.00	0.00	0.00	0.00	0.00	0.00	1.56	4.32	5.88
2012	0.75	0.37	0.52	0.00	0.00	0.00	0.00	0.00	0.00	1.64	4.45	6.09
2013	0.77	0.39	0.55	0.00	0.00	0.00	0.00	0.00	0.00	1.71	4.59	6.30
2014	0.80	0.40	0.59	0.00	0.00	0.00	0.00	0.00	0.00	1.79	4.73	6.52
2015	0.82	0.41	0.64	0.10	0.24	0.15	0.00	0.00	0.00	2.37	4.88	7.24
2016	0.85	0.43	0.68	0.10	0.25	0.16	0.00	0.00	0.00	2.47	5.03	7.50
2017	0.88	0.44	0.73	0.10	0.26	0.16	0.00	0.00	0.00	2.58	5.19	7.77
2018	0.91	0.46	0.79	0.11	0.27	0.17	0.00	0.00	0.00	2.70	5.35	8.05
2019	0.94	0.47	0.84	0.11	0.28	0.17	0.00	0.00	0.00	2.82	5.51	8.33
2020	0.97	0.49	0.91	0.11	0.29	0.18	0.13	0.06	0.00	3.14	5.68	8.83
2021	1.01	0.51	0.97	0.12	0.30	0.19	0.13	0.06	0.00	3.28	5.86	9.14
2022	1.04	0.52	1.04	0.12	0.31	0.19	0.14	0.06	0.00	3.43	6.04	9.47
2023	1.08	0.54	1.12	0.13	0.32	0.20	0.14	0.06	0.00	3.58	6.23	9.81
2024	1.11	0.56	1.20	0.13	0.33	0.21	0.14	0.06	0.00	3.74	6.42	10.16
2025	1.15	0.58	1.29	0.13	0.34	0.21	0.14	0.06	0.51	4.42	6.62	11.04
2026	1.19	0.60	1.38	0.14	0.35	0.22	0.14	0.06	0.52	4.61	6.82	11.44
2027	1.23	0.62	1.49	0.14	0.36	0.23	0.14	0.06	0.53	4.81	7.04	11.85
2028	1.27	0.64	1.59	0.15	0.38	0.24	0.15	0.06	0.55	5.03	7.25	12.28
2029	1.32	0.66	1.60	0.15	0.39	0.25	0.15	0.06	0.56	5.14	7.48	12.62
2030	1.36	0.68	1.60	0.16	0.40	0.25	0.15	0.06	0.58	5.25	7.71	12.96
2031	1.41	0.71	1.60	0.16	0.42	0.26	0.15	0.07	0.60	5.37	7.95	13.32
2032	1.46	0.73	1.60	0.17	0.43	0.27	0.15	0.07	0.61	5.49	8.20	13.69
2033	1.51	0.76	1.60	0.18	0.45	0.28	0.15	0.07	0.63	5.62	8.45	14.07
2034	1.56	0.78	1.60	0.18	0.46	0.29	0.16	0.07	0.65	5.74	8.71	14.46
2035	1.61	0.79	1.60	0.19	0.48	0.30	0.16	0.07	0.67	5.86	8.98	14.85
2036	1.66	0.79	1.60	0.20	0.50	0.31	0.16	0.07	0.68	5.97	9.26	15.23
2037	1.72	0.79	1.60	0.20	0.51	0.32	0.16	0.07	0.70	6.09	9.55	15.63
2038	1.78	0.79	1.60	0.21	0.53	0.33	0.16	0.07	0.72	6.20	9.84	16.05
2039	1.84	0.79	1.60	0.22	0.55	0.35	0.16	0.07	0.74	6.32	10.15	16.47
2040	1.90	0.79	1.60	0.22	0.57	0.36	0.17	0.07	0.76	6.45	10.46	16.91
2041	1.97	0.79	1.60	0.23	0.59	0.37	0.17	0.07	0.79	6.58	10.79	17.37
2042	2.03	0.79	1.60	0.24	0.61	0.38	0.17	0.07	0.81	6.71	11.12	17.83
2043	2.10	0.79	1.60	0.25	0.63	0.40	0.17	0.08	0.83	6.85	11.47	18.31
2044	2.18	0.79	1.60	0.26	0.65	0.41	0.17	0.08	0.85	6.99	11.82	18.81
2045	2.25	0.79	1.60	0.27	0.67	0.42	0.18	0.08	0.88	7.14	12.19	19.33
2046	2.33	0.79	1.60	0.27	0.70	0.44	0.18	0.08	0.90	7.29	12.57	19.85
2047	2.40	0.79	1.60	0.28	0.72	0.45	0.18	0.08	0.93	7.44	12.96	20.40
2048	2.49	0.79	1.60	0.29	0.75	0.47	0.18	0.08	0.95	7.60	13.36	20.96
2049	2.57	0.79	1.60	0.30	0.77	0.49	0.18	0.08	0.98	7.77	13.77	21.54
2050	2.66	0.79	1.60	0.32	0.80	0.50	0.19	0.08	1.01	7.94	14.20	22.14

Scenario 1

**DESIGN WATER DEMAND OF NEW FACILITIES BY ENTITY
(DISCONTINUE WELLS ON DATE SPECIFIED)**

(Includes Weatherford for Line 1)
(mgd)

Year to Start Regional Service	2005	2005	2005	2015	2015	2015	2020	2020	2025	2000		
Year to Take Wells Off-line	2010	2010	2010	1998	1998	1998	1998	1998	1998	1998		
Dependable Well Production	1.05	0.35	0.55	0.00	0.24	0.24	0.25	0.11	0.95	0.00		
	A	B	C	D	E	F	G	H	I	J		
Year	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta	Annetta South	Fort Worth North	Fort Worth South	Non-City SE Parker	Total	W'ford	Total
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.79	5.79
2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97	5.97
2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.15	6.15
2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.34	6.34
2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.54	6.54
2005	0.06	0.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.30	6.74	7.04
2006	0.09	0.22	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.40	6.95	7.35
2007	0.13	0.24	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.51	7.16	7.67
2008	0.17	0.26	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.62	7.39	8.00
2009	0.22	0.29	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.73	7.62	8.35
2010	0.26	0.31	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.86	7.85	8.71
2011	1.35	0.68	0.90	0.00	0.00	0.00	0.00	0.00	0.00	2.93	8.09	11.03
2012	1.40	0.70	0.97	0.00	0.00	0.00	0.00	0.00	0.00	3.07	8.35	11.41
2013	1.45	0.73	1.04	0.00	0.00	0.00	0.00	0.00	0.00	3.21	8.60	11.81
2014	1.50	0.75	1.11	0.00	0.00	0.00	0.00	0.00	0.00	3.36	8.87	12.23
2015	1.55	0.78	1.19	0.18	0.45	0.29	0.00	0.00	0.00	4.44	9.15	13.58
2016	1.60	0.80	1.28	0.19	0.47	0.30	0.00	0.00	0.00	4.64	9.43	14.06
2017	1.65	0.83	1.38	0.19	0.49	0.31	0.00	0.00	0.00	4.84	9.72	14.57
2018	1.71	0.86	1.48	0.20	0.50	0.32	0.00	0.00	0.00	5.06	10.02	15.09
2019	1.77	0.89	1.58	0.21	0.52	0.33	0.00	0.00	0.00	5.29	10.33	15.63
2020	1.83	0.92	1.70	0.21	0.54	0.34	0.25	0.11	0.00	5.89	10.65	16.55
2021	1.89	0.95	1.82	0.22	0.56	0.35	0.25	0.11	0.00	6.15	10.98	17.14
2022	1.95	0.98	1.96	0.23	0.58	0.36	0.25	0.11	0.00	6.43	11.33	17.75
2023	2.02	1.01	2.10	0.24	0.60	0.38	0.26	0.11	0.00	6.71	11.68	18.39
2024	2.09	1.05	2.25	0.24	0.62	0.39	0.26	0.11	0.00	7.02	12.04	19.05
2025	2.16	1.08	2.42	0.25	0.64	0.40	0.26	0.11	0.95	8.28	12.41	20.69
2026	2.23	1.12	2.60	0.26	0.66	0.42	0.27	0.12	0.97	8.65	12.80	21.44
2027	2.31	1.16	2.79	0.27	0.68	0.43	0.27	0.12	1.00	9.03	13.19	22.22
2028	2.39	1.20	2.99	0.28	0.71	0.45	0.27	0.12	1.03	9.43	13.60	23.03
2029	2.47	1.24	2.99	0.29	0.73	0.46	0.28	0.12	1.06	9.64	14.02	23.66
2030	2.55	1.28	2.99	0.30	0.76	0.48	0.28	0.12	1.09	9.85	14.46	24.31
2031	2.64	1.33	2.99	0.31	0.78	0.49	0.28	0.12	1.12	10.07	14.91	24.98
2032	2.73	1.37	2.99	0.32	0.81	0.51	0.28	0.12	1.15	10.30	15.37	25.66
2033	2.82	1.42	2.99	0.33	0.84	0.53	0.29	0.13	1.18	10.53	15.85	26.37
2034	2.92	1.47	2.99	0.34	0.87	0.55	0.29	0.13	1.22	10.77	16.34	27.11
2035	3.02	1.49	2.99	0.35	0.90	0.57	0.29	0.13	1.25	10.99	16.84	27.84
2036	3.12	1.49	2.99	0.37	0.93	0.59	0.30	0.13	1.28	11.20	17.36	28.56
2037	3.23	1.49	2.99	0.38	0.96	0.61	0.30	0.13	1.32	11.41	17.90	29.31
2038	3.34	1.49	2.99	0.39	1.00	0.63	0.31	0.13	1.36	11.63	18.46	30.09
2039	3.45	1.49	2.99	0.41	1.03	0.65	0.31	0.13	1.40	11.86	19.03	30.89
2040	3.57	1.49	2.99	0.42	1.07	0.67	0.31	0.14	1.43	12.09	19.62	31.71
2041	3.69	1.49	2.99	0.43	1.10	0.69	0.32	0.14	1.47	12.33	20.23	32.56
2042	3.81	1.49	2.99	0.45	1.14	0.72	0.32	0.14	1.52	12.58	20.86	33.44
2043	3.94	1.49	2.99	0.47	1.18	0.74	0.32	0.14	1.56	12.84	21.50	34.34
2044	4.08	1.49	2.99	0.48	1.22	0.77	0.33	0.14	1.60	13.10	22.17	35.27
2045	4.22	1.49	2.99	0.50	1.26	0.80	0.33	0.14	1.65	13.38	22.86	36.23
2046	4.36	1.49	2.99	0.52	1.31	0.82	0.33	0.15	1.69	13.66	23.56	37.23
2047	4.51	1.49	2.99	0.53	1.35	0.85	0.34	0.15	1.74	13.96	24.29	38.25
2048	4.66	1.49	2.99	0.55	1.40	0.88	0.34	0.15	1.79	14.26	25.05	39.31
2049	4.82	1.49	2.99	0.57	1.45	0.91	0.35	0.15	1.84	14.57	25.82	40.40
2050	4.98	1.49	2.99	0.59	1.50	0.94	0.35	0.15	1.89	14.89	26.63	41.52

Scenario 1

COST OF PURCHASING RAW WATER
(All cost amounts shown are in current Dollars)

Year of First Use	Annual Raw Water Use (excl W'ford) 1 MGD	Raw Water Purchase Price \$0.62	Plant Design Capacity	Buy-In Cost (\$/mgd Capacity) \$200,000.00						
Based on Average Daily Use		Based on Design Flows 0.60 gpm/ customer					Total Annual Cost			
Year	Raw Water Used 1000 Gal	Raw Water Purchase \$/ 1000 gal	Raw Water Flows (MGD)	Raw Water Use Based on Plant Capacity			TRWD System Buy In \$ 1998	Capital \$ 1998	O&M \$ 1998	Total \$ 1998
				Plant Size (MGD)	Excess Capacity (MGD)	Plant Upgrade (MGD)				
1998	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	\$0
1999	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	\$0
2000	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	\$0
2001	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	\$0
2002	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	\$0
2003	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	\$0
2004	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	\$0
2005	438,590	\$271,926	1.00	2.00	1.00	2.00	\$400,000	\$400,000	\$271,926	\$671,926
2006	457,993	\$283,956	1.00	2.00	1.00	0.00	\$0	\$0	\$283,956	\$283,956
2007	478,384	\$296,598	1.00	2.00	1.00	0.00	\$0	\$0	\$296,598	\$296,598
2008	499,821	\$309,889	1.00	2.00	1.00	0.00	\$0	\$0	\$309,889	\$309,889
2009	522,364	\$323,866	1.00	2.00	1.00	0.00	\$0	\$0	\$323,866	\$323,866
2010	546,080	\$338,569	1.00	2.00	1.00	0.00	\$0	\$0	\$338,569	\$338,569
2011	571,037	\$354,043	2.93	6.00	3.07	4.00	\$800,000	\$800,000	\$354,043	\$1,154,043
2012	597,310	\$370,332	3.07	6.00	2.93	0.00	\$0	\$0	\$370,332	\$370,332
2013	624,977	\$387,486	3.21	6.00	2.79	0.00	\$0	\$0	\$387,486	\$387,486
2014	654,123	\$405,557	3.36	6.00	2.64	0.00	\$0	\$0	\$405,557	\$405,557
2015	683,727	\$535,511	4.44	6.00	1.56	0.00	\$0	\$0	\$535,511	\$535,511
2016	902,313	\$559,434	4.64	6.00	1.36	0.00	\$0	\$0	\$559,434	\$559,434
2017	942,879	\$584,585	4.84	6.00	1.16	0.00	\$0	\$0	\$584,585	\$584,585
2018	985,543	\$611,036	5.06	6.00	0.94	0.00	\$0	\$0	\$611,036	\$611,036
2019	1,030,427	\$638,865	5.29	6.00	0.71	0.00	\$0	\$0	\$638,865	\$638,865
2020	1,147,110	\$711,208	5.89	6.00	0.11	0.00	\$0	\$0	\$711,208	\$711,208
2021	1,197,638	\$742,535	6.15	10.00	3.85	4.00	\$800,000	\$800,000	\$742,535	\$1,542,535
2022	1,250,817	\$775,506	6.43	10.00	3.57	0.00	\$0	\$0	\$775,506	\$775,506
2023	1,306,806	\$810,220	6.71	10.00	3.29	0.00	\$0	\$0	\$810,220	\$810,220
2024	1,365,775	\$846,780	7.02	10.00	2.98	0.00	\$0	\$0	\$846,780	\$846,780
2025	1,612,427	\$999,705	8.28	10.00	1.72	0.00	\$0	\$0	\$999,705	\$999,705
2026	1,683,077	\$1,043,508	8.65	10.00	1.35	0.00	\$0	\$0	\$1,043,508	\$1,043,508
2027	1,757,432	\$1,089,608	9.03	10.00	0.97	0.00	\$0	\$0	\$1,089,608	\$1,089,608
2028	1,835,715	\$1,138,143	9.43	10.00	0.57	0.00	\$0	\$0	\$1,138,143	\$1,138,143
2029	1,876,380	\$1,163,356	9.64	10.00	0.36	0.00	\$0	\$0	\$1,163,356	\$1,163,356
2030	1,917,599	\$1,188,911	9.85	10.00	0.15	0.00	\$0	\$0	\$1,188,911	\$1,188,911
2031	1,960,171	\$1,215,306	10.07	16.00	5.93	6.00	\$1,200,000	\$1,200,000	\$1,215,306	\$2,415,306
2032	2,004,143	\$1,242,569	10.30	16.00	5.70	0.00	\$0	\$0	\$1,242,569	\$1,242,569
2033	2,049,560	\$1,270,727	10.53	16.00	5.47	0.00	\$0	\$0	\$1,270,727	\$1,270,727
2034	2,096,471	\$1,299,812	10.77	16.00	5.23	0.00	\$0	\$0	\$1,299,812	\$1,299,812
2035	2,139,894	\$1,326,734	10.99	16.00	5.01	0.00	\$0	\$0	\$1,326,734	\$1,326,734
2036	2,179,911	\$1,351,545	11.20	16.00	4.80	0.00	\$0	\$0	\$1,351,545	\$1,351,545
2037	2,221,234	\$1,377,165	11.41	16.00	4.59	0.00	\$0	\$0	\$1,377,165	\$1,377,165
2038	2,263,909	\$1,403,623	11.63	16.00	4.37	0.00	\$0	\$0	\$1,403,623	\$1,403,623
2039	2,307,978	\$1,430,946	11.86	16.00	4.14	0.00	\$0	\$0	\$1,430,946	\$1,430,946
2040	2,353,489	\$1,459,163	12.09	16.00	3.91	0.00	\$0	\$0	\$1,459,163	\$1,459,163
2041	2,400,488	\$1,488,303	12.33	16.00	3.67	0.00	\$0	\$0	\$1,488,303	\$1,488,303
2042	2,449,027	\$1,518,397	12.58	16.00	3.42	0.00	\$0	\$0	\$1,518,397	\$1,518,397
2043	2,499,156	\$1,549,476	12.84	16.00	3.16	0.00	\$0	\$0	\$1,549,476	\$1,549,476
2044	2,550,927	\$1,581,575	13.10	16.00	2.90	0.00	\$0	\$0	\$1,581,575	\$1,581,575
2045	2,604,395	\$1,614,725	13.38	16.00	2.62	0.00	\$0	\$0	\$1,614,725	\$1,614,725
2046	2,659,617	\$1,648,962	13.66	16.00	2.34	0.00	\$0	\$0	\$1,648,962	\$1,648,962
2047	2,716,650	\$1,684,323	13.96	16.00	2.04	0.00	\$0	\$0	\$1,684,323	\$1,684,323
2048	2,775,556	\$1,720,845	14.26	16.00	1.74	0.00	\$0	\$0	\$1,720,845	\$1,720,845
2049	2,836,396	\$1,758,566	14.57	16.00	1.43	0.00	\$0	\$0	\$1,758,566	\$1,758,566
2050	2,899,235	\$1,797,526	14.89	16.00	1.11	0.00	\$0	\$0	\$1,797,526	\$1,797,526

Scenario 1

RAW WATER INTAKE AND PUMPING
(Includes Weatherford)
(All cost amounts shown are in current Dollars)

Year of First Use	Upgrade Increment (MGD)	Construction Cost Per Increment	Upgrade Increment Gallons	Cost Per GPM Capacity	Construction Cost Per Increment	Cost Per 1000 Gal									
2000	12	\$472,500	10000	\$203	\$2,025,000	\$0.05									
Capital Costs							O&M Costs		Total Annual Cost						
Based on 0.6 gpm per customer															
Year	Intake Structure				Raw Water Intake \$ 1998	Pumping			Raw Water Pumping Equipment \$ 1998	Annual Flow 1000 gal	Raw Water Pumping \$ 1998	Capital \$ 1998	O&M \$ 1998	Total \$ 1998	
	Design Daily Flows (MGD)	Build 12 MGD Intake (MGD)	Excess Capacity (MGD)	Intake Capacity Addition (MGD)		Required Flow Capacity (gpm)	Actual Flow Capacity (gpm)	Excess Capacity (gpm)							Pumping Capacity Addition (gpm)
1998	0.00	0.00	0.00	0.00	\$0	0	0	0	\$0	0	\$0	\$0	\$0	\$0	
1999	0.00	0.00	0.00	0.00	\$0	0	0	0	\$0	0	\$0	\$0	\$0	\$0	
2000	5.79	12.00	6.21	12.00	\$472,500	4,018	10,000	5,982	10,000	\$2,025,000	2,111,792	\$105,590	\$2,497,500	\$105,590	\$2,603,090
2001	5.97	12.00	6.03	0.00	\$0	4,142	10,000	5,858	0	\$0	2,177,257	\$108,863	\$0	\$108,863	\$108,863
2002	6.15	12.00	5.85	0.00	\$0	4,271	10,000	5,729	0	\$0	2,244,752	\$112,238	\$0	\$112,238	\$112,238
2003	6.34	12.00	5.66	0.00	\$0	4,403	10,000	5,597	0	\$0	2,314,340	\$115,717	\$0	\$115,717	\$115,717
2004	6.54	12.00	5.46	0.00	\$0	4,540	10,000	5,460	0	\$0	2,386,084	\$119,304	\$0	\$119,304	\$119,304
2005	7.04	12.00	4.96	0.00	\$0	4,891	10,000	5,109	0	\$0	2,570,660	\$128,533	\$0	\$128,533	\$128,533
2006	7.35	12.00	4.65	0.00	\$0	5,105	10,000	4,895	0	\$0	2,683,302	\$134,165	\$0	\$134,165	\$134,165
2007	7.67	12.00	4.33	0.00	\$0	5,328	10,000	4,672	0	\$0	2,800,161	\$140,008	\$0	\$140,008	\$140,008
2008	8.00	12.00	4.00	0.00	\$0	5,558	10,000	4,442	0	\$0	2,921,417	\$146,071	\$0	\$146,071	\$146,071
2009	8.35	12.00	3.65	0.00	\$0	5,798	10,000	4,202	0	\$0	3,047,262	\$152,363	\$0	\$152,363	\$152,363
2010	8.71	12.00	3.29	0.00	\$0	6,046	10,000	3,954	0	\$0	3,177,896	\$158,895	\$0	\$158,895	\$158,895
2011	11.03	12.00	0.97	0.00	\$0	7,658	10,000	2,342	0	\$0	4,025,279	\$201,264	\$0	\$201,264	\$201,264
2012	11.41	12.00	0.59	0.00	\$0	7,926	10,000	2,074	0	\$0	4,166,133	\$208,307	\$0	\$208,307	\$208,307
2013	11.81	12.00	0.19	0.00	\$0	8,205	10,000	1,795	0	\$0	4,312,441	\$215,622	\$0	\$215,622	\$215,622
2014	12.23	24.00	11.77	12.00	\$472,500	8,494	10,000	1,506	0	\$0	4,464,448	\$223,222	\$472,500	\$223,222	\$695,722
2015	13.58	24.00	10.42	0.00	\$0	9,433	10,000	567	0	\$0	4,957,832	\$247,892	\$0	\$247,892	\$247,892
2016	14.06	24.00	9.94	0.00	\$0	9,767	10,000	233	0	\$0	5,133,669	\$256,683	\$0	\$256,683	\$256,683
2017	14.57	24.00	9.43	0.00	\$0	10,115	20,000	9,885	10,000	\$2,025,000	5,316,428	\$265,821	\$2,025,000	\$265,821	\$2,290,821
2018	15.09	24.00	8.91	0.00	\$0	10,476	20,000	9,524	0	\$0	5,506,426	\$275,321	\$0	\$275,321	\$275,321
2019	15.63	24.00	8.37	0.00	\$0	10,852	20,000	9,148	0	\$0	5,703,999	\$285,200	\$0	\$285,200	\$285,200
2020	16.55	24.00	7.45	0.00	\$0	11,491	20,000	8,509	0	\$0	6,039,710	\$301,985	\$0	\$301,985	\$301,985
2021	17.14	24.00	6.86	0.00	\$0	11,901	20,000	8,099	0	\$0	6,255,005	\$312,750	\$0	\$312,750	\$312,750
2022	17.75	24.00	6.25	0.00	\$0	12,327	20,000	7,673	0	\$0	6,479,007	\$323,950	\$0	\$323,950	\$323,950
2023	18.39	24.00	5.61	0.00	\$0	12,770	20,000	7,230	0	\$0	6,712,133	\$335,607	\$0	\$335,607	\$335,607
2024	19.05	24.00	4.95	0.00	\$0	13,232	20,000	6,768	0	\$0	6,954,818	\$347,741	\$0	\$347,741	\$347,741
2025	20.69	24.00	3.31	0.00	\$0	14,371	20,000	5,629	0	\$0	7,553,504	\$377,675	\$0	\$377,675	\$377,675
2026	21.44	24.00	2.56	0.00	\$0	14,890	20,000	5,110	0	\$0	7,826,410	\$391,320	\$0	\$391,320	\$391,320
2027	22.22	24.00	1.78	0.00	\$0	15,431	20,000	4,569	0	\$0	8,110,615	\$405,531	\$0	\$405,531	\$405,531
2028	23.03	24.00	0.97	0.00	\$0	15,994	20,000	4,006	0	\$0	8,406,673	\$420,334	\$0	\$420,334	\$420,334
2029	23.68	24.00	0.34	0.00	\$0	16,432	20,000	3,568	0	\$0	8,636,827	\$431,841	\$0	\$431,841	\$431,841
2030	24.31	36.00	11.69	12.00	\$472,500	16,881	20,000	3,119	0	\$0	8,872,789	\$443,639	\$472,500	\$443,639	\$916,139
2031	24.98	36.00	11.02	0.00	\$0	17,344	20,000	2,656	0	\$0	9,116,208	\$455,810	\$0	\$455,810	\$455,810
2032	25.66	36.00	10.34	0.00	\$0	17,822	20,000	2,178	0	\$0	9,367,322	\$468,366	\$0	\$468,366	\$468,366
2033	26.37	36.00	9.63	0.00	\$0	18,315	20,000	1,685	0	\$0	9,626,375	\$481,319	\$0	\$481,319	\$481,319
2034	27.11	36.00	8.89	0.00	\$0	18,823	20,000	1,177	0	\$0	9,893,620	\$494,681	\$0	\$494,681	\$494,681
2035	27.84	36.00	8.16	0.00	\$0	19,330	20,000	670	0	\$0	10,159,883	\$507,994	\$0	\$507,994	\$507,994
2036	28.56	36.00	7.44	0.00	\$0	19,835	20,000	165	0	\$0	10,425,490	\$521,274	\$0	\$521,274	\$521,274
2037	29.31	36.00	6.69	0.00	\$0	20,357	30,000	9,643	10,000	\$2,025,000	10,699,455	\$534,973	\$2,025,000	\$534,973	\$2,559,973
2038	30.09	36.00	5.91	0.00	\$0	20,894	30,000	9,106	0	\$0	10,982,043	\$549,102	\$0	\$549,102	\$549,102
2039	30.89	36.00	5.11	0.00	\$0	21,449	30,000	8,551	0	\$0	11,273,526	\$563,676	\$0	\$563,676	\$563,676
2040	31.71	36.00	4.29	0.00	\$0	22,021	30,000	7,979	0	\$0	11,574,187	\$578,709	\$0	\$578,709	\$578,709
2041	32.56	36.00	3.44	0.00	\$0	22,611	30,000	7,389	0	\$0	11,884,315	\$594,216	\$0	\$594,216	\$594,216
2042	33.44	36.00	2.56	0.00	\$0	23,219	30,000	6,781	0	\$0	12,204,211	\$610,211	\$0	\$610,211	\$610,211
2043	34.34	36.00	1.66	0.00	\$0	23,847	30,000	6,153	0	\$0	12,534,182	\$626,709	\$0	\$626,709	\$626,709
2044	35.27	36.00	0.73	0.00	\$0	24,495	30,000	5,505	0	\$0	12,874,549	\$643,727	\$0	\$643,727	\$643,727
2045	36.23	48.00	11.77	12.00	\$472,500	25,163	30,000	4,837	0	\$0	13,225,640	\$661,282	\$472,500	\$661,282	\$1,133,782
2046	37.23	48.00	10.77	0.00	\$0	25,852	30,000	4,148	0	\$0	13,587,796	\$679,390	\$0	\$679,390	\$679,390
2047	38.25	48.00	9.75	0.00	\$0	26,563	30,000	3,437	0	\$0	13,961,365	\$698,068	\$0	\$698,068	\$698,068
2048	39.31	48.00	8.69	0.00	\$0	27,296	30,000	2,704	0	\$0	14,346,711	\$717,336	\$0	\$717,336	\$717,336
2049	40.40	48.00	7.60	0.00	\$0	28,052	30,000	1,948	0	\$0	14,744,205	\$737,210	\$0	\$737,210	\$737,210
2050	41.52	48.00	6.48	0.00	\$0	28,832	30,000	1,168	0	\$0	15,154,232	\$757,712	\$0	\$757,712	\$757,712

Scenario 1

TREATMENT PLANT COSTS
(Excludes Weatherford)
 (All cost amounts shown are in current Dollars)

Year of First Use	Land Purchase (\$)	Land Area (Acres)	Expansion Increment (MGD)	Use plant cost lookup table	Cost Per Gallon						
2005	\$165,000.00	10	2		\$0.08						
Year	Land Capital	Treatment Plant Capital				O&M		Total Annual Cost			
	Treatment Plant Land Each	Flow Expected MGD	Plant Supplied MGD	Excess Capacity MGD	Upgrade Needed MGD	Treatment Plant \$ 1998	Daily Rated Flow Gal/day	Cost \$ 1998	Capital \$ 1998	O&M \$ 1998	Total \$ 1998
1998	\$0	0.00	0	0.00	0.00	\$0.00	0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0.00	0.00	\$0.00	0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0.00	0.00	\$0.00	0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0.00	0.00	\$0.00	0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0.00	0.00	\$0.00	0	\$0	\$0	\$0	\$0
2003	\$165,000	0.00	0	0.00	0.00	\$0.00	0	\$0	\$165,000	\$0	\$165,000
2004	\$0	0.00	0	0.00	0.00	\$0.00	0	\$0	\$0	\$0	\$0
2005	\$0	1.00	2	1.00	2.00	\$3,375,000.00	1,000,000	\$80,000	\$3,375,000	\$80,000	\$3,455,000
2006	\$0	1.00	2	1.00	0.00	\$0.00	1,000,000	\$80,000	\$0	\$80,000	\$80,000
2007	\$0	1.00	2	1.00	0.00	\$0.00	1,000,000	\$80,000	\$0	\$80,000	\$80,000
2008	\$0	1.00	2	1.00	0.00	\$0.00	1,000,000	\$80,000	\$0	\$80,000	\$80,000
2009	\$0	1.00	2	1.00	0.00	\$0.00	1,000,000	\$80,000	\$0	\$80,000	\$80,000
2010	\$0	1.00	2	1.00	0.00	\$0.00	1,000,000	\$80,000	\$0	\$80,000	\$80,000
2011	\$0	2.93	6	3.07	4.00	\$5,400,000.00	2,933,409	\$234,673	\$5,400,000	\$234,673	\$5,634,673
2012	\$0	3.07	6	2.93	0.00	\$0.00	3,068,373	\$245,470	\$0	\$245,470	\$245,470
2013	\$0	3.21	6	2.79	0.00	\$0.00	3,210,500	\$256,840	\$0	\$256,840	\$256,840
2014	\$0	3.36	6	2.64	0.00	\$0.00	3,360,223	\$268,818	\$0	\$268,818	\$268,818
2015	\$0	4.44	6	1.56	0.00	\$0.00	4,436,954	\$354,956	\$0	\$354,956	\$354,956
2016	\$0	4.64	6	1.36	0.00	\$0.00	4,635,167	\$370,813	\$0	\$370,813	\$370,813
2017	\$0	4.84	6	1.16	0.00	\$0.00	4,843,557	\$387,485	\$0	\$387,485	\$387,485
2018	\$0	5.06	6	0.94	0.00	\$0.00	5,062,719	\$405,018	\$0	\$405,018	\$405,018
2019	\$0	5.29	6	0.71	0.00	\$0.00	5,293,290	\$423,463	\$0	\$423,463	\$423,463
2020	\$0	5.89	6	0.11	0.00	\$0.00	5,892,689	\$471,415	\$0	\$471,415	\$471,415
2021	\$0	6.15	10	3.85	4.00	\$5,400,000.00	6,152,249	\$492,180	\$5,400,000	\$492,180	\$5,892,180
2022	\$0	6.43	10	3.57	0.00	\$0.00	6,425,428	\$514,034	\$0	\$514,034	\$514,034
2023	\$0	6.71	10	3.29	0.00	\$0.00	6,713,043	\$537,043	\$0	\$537,043	\$537,043
2024	\$0	7.02	10	2.98	0.00	\$0.00	7,015,967	\$561,277	\$0	\$561,277	\$561,277
2025	\$0	8.28	10	1.72	0.00	\$0.00	8,283,014	\$662,641	\$0	\$662,641	\$662,641
2026	\$0	8.65	10	1.35	0.00	\$0.00	8,645,945	\$691,676	\$0	\$691,676	\$691,676
2027	\$0	9.03	10	0.97	0.00	\$0.00	9,027,904	\$722,232	\$0	\$722,232	\$722,232
2028	\$0	9.43	10	0.57	0.00	\$0.00	9,430,040	\$754,403	\$0	\$754,403	\$754,403
2029	\$0	9.64	10	0.36	0.00	\$0.00	9,638,939	\$771,115	\$0	\$771,115	\$771,115
2030	\$0	9.85	10	0.15	0.00	\$0.00	9,850,679	\$788,054	\$0	\$788,054	\$788,054
2031	\$0	10.07	16	5.93	6.00	\$7,425,000.00	10,069,373	\$805,550	\$7,425,000	\$805,550	\$8,230,550
2032	\$0	10.30	16	5.70	0.00	\$0.00	10,295,254	\$823,620	\$0	\$823,620	\$823,620
2033	\$0	10.53	16	5.47	0.00	\$0.00	10,528,561	\$842,285	\$0	\$842,285	\$842,285
2034	\$0	10.77	16	5.23	0.00	\$0.00	10,769,541	\$861,563	\$0	\$861,563	\$861,563
2035	\$0	10.99	16	5.01	0.00	\$0.00	10,992,605	\$879,408	\$0	\$879,408	\$879,408
2036	\$0	11.20	16	4.80	0.00	\$0.00	11,198,171	\$895,854	\$0	\$895,854	\$895,854
2037	\$0	11.41	16	4.59	0.00	\$0.00	11,410,451	\$912,836	\$0	\$912,836	\$912,836
2038	\$0	11.63	16	4.37	0.00	\$0.00	11,629,667	\$930,373	\$0	\$930,373	\$930,373
2039	\$0	11.86	16	4.14	0.00	\$0.00	11,856,051	\$948,484	\$0	\$948,484	\$948,484
2040	\$0	12.09	16	3.91	0.00	\$0.00	12,089,838	\$967,187	\$0	\$967,187	\$967,187
2041	\$0	12.33	16	3.67	0.00	\$0.00	12,331,276	\$986,502	\$0	\$986,502	\$986,502
2042	\$0	12.58	16	3.42	0.00	\$0.00	12,580,619	\$1,006,450	\$0	\$1,006,450	\$1,006,450
2043	\$0	12.84	16	3.16	0.00	\$0.00	12,838,128	\$1,027,050	\$0	\$1,027,050	\$1,027,050
2044	\$0	13.10	16	2.90	0.00	\$0.00	13,104,075	\$1,048,326	\$0	\$1,048,326	\$1,048,326
2045	\$0	13.38	16	2.62	0.00	\$0.00	13,378,741	\$1,070,299	\$0	\$1,070,299	\$1,070,299
2046	\$0	13.66	16	2.34	0.00	\$0.00	13,662,414	\$1,092,993	\$0	\$1,092,993	\$1,092,993
2047	\$0	13.96	16	2.04	0.00	\$0.00	13,955,395	\$1,116,432	\$0	\$1,116,432	\$1,116,432
2048	\$0	14.26	16	1.74	0.00	\$0.00	14,257,993	\$1,140,639	\$0	\$1,140,639	\$1,140,639
2049	\$0	14.57	16	1.43	0.00	\$0.00	14,570,528	\$1,165,642	\$0	\$1,165,642	\$1,165,642
2050	\$0	14.89	16	1.11	0.00	\$0.00	14,893,330	\$1,191,466	\$0	\$1,191,466	\$1,191,466

STORAGE AND TREATED WATER PUMPING COSTS
(Excludes Weatherford)

(All cost amounts shown are in current Dollars)

Year of First Use	Year	Use Existing Treatment Plant Land	Expansion Increment (gal)	Cost per gallon storage \$1.49	Expansion Increment (gpm)		GPM Capacity \$202.50	Construction Cost Per Increment \$1,012,500.00	Cost per Gallon Cap \$0.01	Pumping O&M		Raw Water Pumping \$1999	Annual Flow 1000 gal	Total Annual Cost	
					Required Capacity (gpm)	Actual Capacity (gpm)				Excess Capacity (gpm)	Pumping Upgrade (gpm)			Raw Water Pumping Equipment \$1999	Storage O&M \$1999
1988	1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	2005	1,000,000	2,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2006	2006	1,000,000	2,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2007	2007	1,000,000	2,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2008	2008	1,000,000	2,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2009	2009	1,000,000	2,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2010	2010	1,000,000	2,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2011	2011	2,933,407	5,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2012	2012	3,068,373	5,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2013	2013	3,210,500	5,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2014	2014	3,360,223	5,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2015	2015	4,436,954	5,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2016	2016	4,635,187	5,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2017	2017	4,843,557	5,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2018	2018	5,062,719	7,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2019	2019	5,293,290	7,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2020	2020	5,892,669	7,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2021	2021	6,152,249	7,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2022	2022	6,425,428	7,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2023	2023	6,713,043	7,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2024	2024	7,015,967	7,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2025	2025	8,283,014	10,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2026	2026	8,645,945	10,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2027	2027	9,027,904	10,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2028	2028	9,430,040	10,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2029	2029	9,838,939	10,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2030	2030	9,850,679	10,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2031	2031	10,069,373	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2032	2032	10,295,254	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2033	2033	10,528,561	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2034	2034	10,769,541	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2035	2035	10,992,605	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2036	2036	11,198,171	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2037	2037	11,410,451	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2038	2038	11,629,667	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2039	2039	11,856,051	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2040	2040	12,089,838	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2041	2041	12,331,276	12,500,000	0	0	0	0	0	0	0	0	0	0	0	0
2042	2042	12,580,619	15,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2043	2043	12,836,128	15,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2044	2044	13,104,075	15,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2045	2045	13,378,741	15,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2046	2046	13,662,414	15,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2047	2047	13,955,395	15,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2048	2048	14,257,983	15,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2049	2049	14,570,528	15,000,000	0	0	0	0	0	0	0	0	0	0	0	0
2050	2050	14,893,330	15,000,000	0	0	0	0	0	0	0	0	0	0	0	0

Scenario 1

PIPE 1 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2000	2000	57000	20	\$22.00	\$1,254,000	1	\$0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	None	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	None	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$1,254,000	5.79	14	36	None	0	22	\$2,052,000	\$14,250	\$3,306,000	\$14,250	\$3,320,250
2001	\$0	5.97	14	36	None	0	22	\$0	\$14,250	\$0	\$14,250	\$14,250
2002	\$0	6.15	14	36	None	0	22	\$0	\$14,250	\$0	\$14,250	\$14,250
2003	\$0	6.34	14	36	None	0	22	\$0	\$14,250	\$0	\$14,250	\$14,250
2004	\$0	6.54	14	36	None	0	22	\$0	\$14,250	\$0	\$14,250	\$14,250
2005	\$0	7.04	15	36	None	0	21	\$0	\$14,250	\$0	\$14,250	\$14,250
2006	\$0	7.35	15	36	None	0	21	\$0	\$14,250	\$0	\$14,250	\$14,250
2007	\$0	7.67	16	36	None	0	20	\$0	\$14,250	\$0	\$14,250	\$14,250
2008	\$0	8.00	16	36	None	0	20	\$0	\$14,250	\$0	\$14,250	\$14,250
2009	\$0	8.35	16	36	None	0	20	\$0	\$14,250	\$0	\$14,250	\$14,250
2010	\$0	8.71	17	36	None	0	19	\$0	\$14,250	\$0	\$14,250	\$14,250
2011	\$0	11.03	19	36	None	0	17	\$0	\$14,250	\$0	\$14,250	\$14,250
2012	\$0	11.41	19	36	None	0	17	\$0	\$14,250	\$0	\$14,250	\$14,250
2013	\$0	11.81	19	36	None	0	17	\$0	\$14,250	\$0	\$14,250	\$14,250
2014	\$0	12.23	20	36	None	0	16	\$0	\$14,250	\$0	\$14,250	\$14,250
2015	\$0	13.58	21	36	None	0	15	\$0	\$14,250	\$0	\$14,250	\$14,250
2016	\$0	14.06	21	36	None	0	15	\$0	\$14,250	\$0	\$14,250	\$14,250
2017	\$0	14.57	21	36	None	0	15	\$0	\$14,250	\$0	\$14,250	\$14,250
2018	\$0	15.09	22	36	None	0	14	\$0	\$14,250	\$0	\$14,250	\$14,250
2019	\$0	15.63	22	36	None	0	14	\$0	\$14,250	\$0	\$14,250	\$14,250
2020	\$0	16.55	23	36	None	0	13	\$0	\$14,250	\$0	\$14,250	\$14,250
2021	\$0	17.14	23	36	None	0	13	\$0	\$14,250	\$0	\$14,250	\$14,250
2022	\$0	17.75	23	36	None	0	13	\$0	\$14,250	\$0	\$14,250	\$14,250
2023	\$0	18.39	24	36	None	0	12	\$0	\$14,250	\$0	\$14,250	\$14,250
2024	\$0	19.05	24	36	None	0	12	\$0	\$14,250	\$0	\$14,250	\$14,250
2025	\$0	20.69	25	36	None	0	11	\$0	\$14,250	\$0	\$14,250	\$14,250
2026	\$0	21.44	26	36	None	0	10	\$0	\$14,250	\$0	\$14,250	\$14,250
2027	\$0	22.22	26	36	None	0	10	\$0	\$14,250	\$0	\$14,250	\$14,250
2028	\$0	23.03	27	36	None	0	9	\$0	\$14,250	\$0	\$14,250	\$14,250
2029	\$0	23.66	27	36	None	0	9	\$0	\$14,250	\$0	\$14,250	\$14,250
2030	\$0	24.31	27	36	None	0	9	\$0	\$14,250	\$0	\$14,250	\$14,250
2031	\$0	24.98	28	36	None	0	8	\$0	\$14,250	\$0	\$14,250	\$14,250
2032	\$0	25.66	28	36	None	0	8	\$0	\$14,250	\$0	\$14,250	\$14,250
2033	\$0	26.37	28	36	None	0	8	\$0	\$14,250	\$0	\$14,250	\$14,250
2034	\$0	27.11	29	36	None	0	7	\$0	\$14,250	\$0	\$14,250	\$14,250
2035	\$0	27.84	29	36	None	0	7	\$0	\$14,250	\$0	\$14,250	\$14,250
2036	\$0	28.56	30	36	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2037	\$0	29.31	30	36	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2038	\$0	30.09	30	36	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2039	\$0	30.89	31	36	None	0	5	\$0	\$14,250	\$0	\$14,250	\$14,250
2040	\$0	31.71	31	36	None	0	5	\$0	\$14,250	\$0	\$14,250	\$14,250
2041	\$0	32.56	32	36	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2042	\$0	33.44	32	36	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2043	\$0	34.34	32	36	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2044	\$0	35.27	33	36	None	0	3	\$0	\$14,250	\$0	\$14,250	\$14,250
2045	\$0	36.23	33	36	None	0	3	\$0	\$14,250	\$0	\$14,250	\$14,250
2046	\$0	37.23	34	36	None	0	2	\$0	\$14,250	\$0	\$14,250	\$14,250
2047	\$0	38.25	34	36	None	0	2	\$0	\$14,250	\$0	\$14,250	\$14,250
2048	\$0	39.31	35	36	None	0	1	\$0	\$14,250	\$0	\$14,250	\$14,250
2049	\$0	40.40	35	36	None	0	1	\$0	\$14,250	\$0	\$14,250	\$14,250
2050	\$0	41.52	36	42	None	0	6	\$2,052,000	\$14,250	\$2,052,000	\$14,250	\$2,066,250

Scenario 1												
PIPE 2 COSTS												
(All cost amounts shown are in current Dollars)												
Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost		Pipe Number	Cost Per Foot				
2005	2003	1470	20	\$22.00	\$32,340		2	0.25				
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	36	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	36	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	36	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$32,340	0.00	0	0	36	0	0	\$0	\$0	\$32,340	\$0	\$32,340
2004	\$0	0.00	0	0	36	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.30	3	10	36	0	7	\$14,700	\$368	\$14,700	\$368	\$15,068
2006	\$0	0.40	4	10	36	0	6	\$0	\$368	\$0	\$368	\$368
2007	\$0	0.51	4	10	36	0	6	\$0	\$368	\$0	\$368	\$368
2008	\$0	0.62	5	10	36	0	5	\$0	\$368	\$0	\$368	\$368
2009	\$0	0.73	5	10	36	0	5	\$0	\$368	\$0	\$368	\$368
2010	\$0	0.86	6	10	36	0	4	\$0	\$368	\$0	\$368	\$368
2011	\$0	2.93	10	10	36	0	0	\$0	\$368	\$0	\$368	\$368
2012	\$0	3.07	10	10	36	0	0	\$0	\$368	\$0	\$368	\$368
2013	\$0	3.21	10	10	36	0	0	\$0	\$368	\$0	\$368	\$368
2014	\$0	3.36	10	10	36	0	0	\$0	\$368	\$0	\$368	\$368
2015	\$0	4.44	12	16	36	0	4	\$23,520	\$368	\$23,520	\$368	\$23,888
2016	\$0	4.64	12	16	36	0	4	\$0	\$368	\$0	\$368	\$368
2017	\$0	4.84	12	16	36	0	4	\$0	\$368	\$0	\$368	\$368
2018	\$0	5.06	13	16	36	0	3	\$0	\$368	\$0	\$368	\$368
2019	\$0	5.29	13	16	36	0	3	\$0	\$368	\$0	\$368	\$368
2020	\$0	5.89	14	16	36	0	2	\$0	\$368	\$0	\$368	\$368
2021	\$0	6.15	14	16	36	0	2	\$0	\$368	\$0	\$368	\$368
2022	\$0	6.43	14	16	36	0	2	\$0	\$368	\$0	\$368	\$368
2023	\$0	6.71	15	16	36	0	1	\$0	\$368	\$0	\$368	\$368
2024	\$0	7.02	15	16	36	0	1	\$0	\$368	\$0	\$368	\$368
2025	\$0	8.28	16	16	36	0	0	\$0	\$368	\$0	\$368	\$368
2026	\$0	8.65	16	16	36	0	0	\$0	\$368	\$0	\$368	\$368
2027	\$0	9.03	17	20	36	0	3	\$29,400	\$368	\$29,400	\$368	\$29,768
2028	\$0	9.43	17	20	36	0	3	\$0	\$368	\$0	\$368	\$368
2029	\$0	9.64	17	20	36	0	3	\$0	\$368	\$0	\$368	\$368
2030	\$0	9.85	18	20	36	0	2	\$0	\$368	\$0	\$368	\$368
2031	\$0	10.07	18	20	36	0	2	\$0	\$368	\$0	\$368	\$368
2032	\$0	10.30	18	20	36	0	2	\$0	\$368	\$0	\$368	\$368
2033	\$0	10.53	18	20	36	0	2	\$0	\$368	\$0	\$368	\$368
2034	\$0	10.77	18	20	36	0	2	\$0	\$368	\$0	\$368	\$368
2035	\$0	10.99	19	20	36	0	1	\$0	\$368	\$0	\$368	\$368
2036	\$0	11.20	19	20	36	0	1	\$0	\$368	\$0	\$368	\$368
2037	\$0	11.41	19	20	36	0	1	\$0	\$368	\$0	\$368	\$368
2038	\$0	11.63	19	20	36	0	1	\$0	\$368	\$0	\$368	\$368
2039	\$0	11.86	19	20	36	0	1	\$0	\$368	\$0	\$368	\$368
2040	\$0	12.09	19	20	36	0	1	\$0	\$368	\$0	\$368	\$368
2041	\$0	12.33	20	20	36	0	0	\$0	\$368	\$0	\$368	\$368
2042	\$0	12.58	20	20	36	0	0	\$0	\$368	\$0	\$368	\$368
2043	\$0	12.84	20	20	36	0	0	\$0	\$368	\$0	\$368	\$368
2044	\$0	13.10	20	20	36	0	0	\$0	\$368	\$0	\$368	\$368
2045	\$0	13.38	20	20	36	0	0	\$0	\$368	\$0	\$368	\$368
2046	\$0	13.66	21	24	36	0	3	\$35,280	\$368	\$35,280	\$368	\$35,648
2047	\$0	13.96	21	24	36	0	3	\$0	\$368	\$0	\$368	\$368
2048	\$0	14.26	21	24	36	0	3	\$0	\$368	\$0	\$368	\$368
2049	\$0	14.57	21	24	36	0	3	\$0	\$368	\$0	\$368	\$368
2050	\$0	14.89	21	24	42	0	3	\$0	\$368	\$0	\$368	\$368

Scenario 1

PIPE 3 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2005	2003	3680	15	\$16.50	\$60,720	3	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$60,720	0.00	0	0	0	0	0	\$0	\$0	\$60,720	\$0	\$60,720
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.10	2	10	10	0	8	\$36,800	\$920	\$36,800	\$920	\$37,720
2006	\$0	0.18	3	10	10	0	7	\$0	\$920	\$0	\$920	\$920
2007	\$0	0.26	3	10	10	0	7	\$0	\$920	\$0	\$920	\$920
2008	\$0	0.35	4	10	10	0	6	\$0	\$920	\$0	\$920	\$920
2009	\$0	0.45	4	10	10	0	6	\$0	\$920	\$0	\$920	\$920
2010	\$0	0.55	5	10	10	0	5	\$0	\$920	\$0	\$920	\$920
2011	\$0	2.25	9	10	10	0	1	\$0	\$920	\$0	\$920	\$920
2012	\$0	2.37	9	10	10	0	1	\$0	\$920	\$0	\$920	\$920
2013	\$0	2.48	9	10	10	0	1	\$0	\$920	\$0	\$920	\$920
2014	\$0	2.61	9	10	10	0	1	\$0	\$920	\$0	\$920	\$920
2015	\$0	2.92	10	10	16	0	0	\$0	\$920	\$0	\$920	\$920
2016	\$0	3.07	10	10	16	0	0	\$0	\$920	\$0	\$920	\$920
2017	\$0	3.22	10	10	16	0	0	\$0	\$920	\$0	\$920	\$920
2018	\$0	3.38	11	16	16	0	5	\$58,880	\$920	\$58,880	\$920	\$59,800
2019	\$0	3.56	11	16	16	0	5	\$0	\$920	\$0	\$920	\$920
2020	\$0	3.99	11	16	16	0	5	\$0	\$920	\$0	\$920	\$920
2021	\$0	4.19	12	16	16	0	4	\$0	\$920	\$0	\$920	\$920
2022	\$0	4.39	12	16	16	0	4	\$0	\$920	\$0	\$920	\$920
2023	\$0	4.61	12	16	16	0	4	\$0	\$920	\$0	\$920	\$920
2024	\$0	4.85	12	16	16	0	4	\$0	\$920	\$0	\$920	\$920
2025	\$0	5.09	13	16	16	0	3	\$0	\$920	\$0	\$920	\$920
2026	\$0	5.36	13	16	16	0	3	\$0	\$920	\$0	\$920	\$920
2027	\$0	5.63	13	16	20	0	3	\$0	\$920	\$0	\$920	\$920
2028	\$0	5.93	14	16	20	0	2	\$0	\$920	\$0	\$920	\$920
2029	\$0	6.03	14	16	20	0	2	\$0	\$920	\$0	\$920	\$920
2030	\$0	6.12	14	16	20	0	2	\$0	\$920	\$0	\$920	\$920
2031	\$0	6.22	14	16	20	0	2	\$0	\$920	\$0	\$920	\$920
2032	\$0	6.33	14	16	20	0	2	\$0	\$920	\$0	\$920	\$920
2033	\$0	6.44	14	16	20	0	2	\$0	\$920	\$0	\$920	\$920
2034	\$0	6.55	14	16	20	0	2	\$0	\$920	\$0	\$920	\$920
2035	\$0	6.66	15	16	20	0	1	\$0	\$920	\$0	\$920	\$920
2036	\$0	6.78	15	16	20	0	1	\$0	\$920	\$0	\$920	\$920
2037	\$0	6.90	15	16	20	0	1	\$0	\$920	\$0	\$920	\$920
2038	\$0	7.03	15	16	20	0	1	\$0	\$920	\$0	\$920	\$920
2039	\$0	7.16	15	16	20	0	1	\$0	\$920	\$0	\$920	\$920
2040	\$0	7.29	15	16	20	0	1	\$0	\$920	\$0	\$920	\$920
2041	\$0	7.43	15	16	20	0	1	\$0	\$920	\$0	\$920	\$920
2042	\$0	7.58	15	16	20	0	1	\$0	\$920	\$0	\$920	\$920
2043	\$0	7.73	16	16	20	0	0	\$0	\$920	\$0	\$920	\$920
2044	\$0	7.88	16	16	20	0	0	\$0	\$920	\$0	\$920	\$920
2045	\$0	8.04	16	16	20	0	0	\$0	\$920	\$0	\$920	\$920
2046	\$0	8.20	16	16	24	0	0	\$0	\$920	\$0	\$920	\$920
2047	\$0	8.37	16	16	24	0	0	\$0	\$920	\$0	\$920	\$920
2048	\$0	8.55	16	16	24	0	0	\$0	\$920	\$0	\$920	\$920
2049	\$0	8.73	17	20	24	0	3	\$73,600	\$920	\$73,600	\$920	\$74,520
2050	\$0	8.92	17	20	24	0	3	\$0	\$920	\$0	\$920	\$920

Scenario 1

PIPE 4 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot
2020	2018	26250	15	\$16.50	\$433,125	4	0.25

Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2006	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2007	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2008	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2009	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2010	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2011	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2012	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2013	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2014	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2015	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2016	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2017	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2018	\$433,125	0.00	0	0	16	0	0	\$0	\$0	\$433,125	\$0	\$433,125
2019	\$0	0.00	0	0	16	0	0	\$0	\$0	\$0	\$0	\$0
2020	\$0	0.25	3	6	16	0	3	\$157,500	\$6,563	\$157,500	\$6,563	\$164,063
2021	\$0	0.25	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2022	\$0	0.25	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2023	\$0	0.26	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2024	\$0	0.26	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2025	\$0	0.26	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2026	\$0	0.27	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2027	\$0	0.27	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2028	\$0	0.27	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2029	\$0	0.28	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2030	\$0	0.28	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2031	\$0	0.28	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2032	\$0	0.28	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2033	\$0	0.29	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2034	\$0	0.29	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2035	\$0	0.29	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2036	\$0	0.30	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2037	\$0	0.30	3	6	16	0	3	\$0	\$6,563	\$0	\$6,563	\$6,563
2038	\$0	0.31	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2039	\$0	0.31	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2040	\$0	0.31	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2041	\$0	0.32	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2042	\$0	0.32	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2043	\$0	0.32	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2044	\$0	0.33	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2045	\$0	0.33	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2046	\$0	0.33	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2047	\$0	0.34	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2048	\$0	0.34	4	6	16	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2049	\$0	0.35	4	6	20	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563
2050	\$0	0.35	4	6	20	0	2	\$0	\$6,563	\$0	\$6,563	\$6,563

Scenario 1

PIPE 5 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct	Linear Feet	Row/Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot
2005	2003	310	15	\$16.50	\$5,115	5	0.25

Year	Capital Costs								O&M Annual Cost			
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$5,115	0.00	0	0	0	0	0	\$0	\$0	\$5,115	\$0	\$5,115
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.10	2	10	10	0	8	\$3,100	\$78	\$3,100	\$78	\$3,178
2006	\$0	0.18	3	10	10	0	7	\$0	\$78	\$0	\$78	\$78
2007	\$0	0.26	3	10	10	0	7	\$0	\$78	\$0	\$78	\$78
2008	\$0	0.35	4	10	10	0	6	\$0	\$78	\$0	\$78	\$78
2009	\$0	0.45	4	10	10	0	6	\$0	\$78	\$0	\$78	\$78
2010	\$0	0.55	5	10	10	0	5	\$0	\$78	\$0	\$78	\$78
2011	\$0	2.25	9	10	10	0	1	\$0	\$78	\$0	\$78	\$78
2012	\$0	2.37	9	10	10	0	1	\$0	\$78	\$0	\$78	\$78
2013	\$0	2.48	9	10	10	0	1	\$0	\$78	\$0	\$78	\$78
2014	\$0	2.61	9	10	10	0	1	\$0	\$78	\$0	\$78	\$78
2015	\$0	2.92	10	10	10	0	0	\$0	\$78	\$0	\$78	\$78
2016	\$0	3.07	10	10	10	0	0	\$0	\$78	\$0	\$78	\$78
2017	\$0	3.22	10	10	10	0	0	\$0	\$78	\$0	\$78	\$78
2018	\$0	3.38	11	16	16	0	5	\$4,960	\$78	\$4,960	\$78	\$5,038
2019	\$0	3.56	11	16	16	0	5	\$0	\$78	\$0	\$78	\$78
2020	\$0	3.74	11	16	16	0	5	\$0	\$78	\$0	\$78	\$78
2021	\$0	3.93	11	16	16	0	5	\$0	\$78	\$0	\$78	\$78
2022	\$0	4.14	12	16	16	0	4	\$0	\$78	\$0	\$78	\$78
2023	\$0	4.36	12	16	16	0	4	\$0	\$78	\$0	\$78	\$78
2024	\$0	4.59	12	16	16	0	4	\$0	\$78	\$0	\$78	\$78
2025	\$0	4.83	12	16	16	0	4	\$0	\$78	\$0	\$78	\$78
2026	\$0	5.09	13	16	16	0	3	\$0	\$78	\$0	\$78	\$78
2027	\$0	5.37	13	16	16	0	3	\$0	\$78	\$0	\$78	\$78
2028	\$0	5.66	13	16	16	0	3	\$0	\$78	\$0	\$78	\$78
2029	\$0	5.75	14	16	16	0	2	\$0	\$78	\$0	\$78	\$78
2030	\$0	5.85	14	16	16	0	2	\$0	\$78	\$0	\$78	\$78
2031	\$0	5.94	14	16	16	0	2	\$0	\$78	\$0	\$78	\$78
2032	\$0	6.04	14	16	16	0	2	\$0	\$78	\$0	\$78	\$78
2033	\$0	6.15	14	16	16	0	2	\$0	\$78	\$0	\$78	\$78
2034	\$0	6.25	14	16	16	0	2	\$0	\$78	\$0	\$78	\$78
2035	\$0	6.37	14	16	16	0	2	\$0	\$78	\$0	\$78	\$78
2036	\$0	6.48	14	16	16	0	2	\$0	\$78	\$0	\$78	\$78
2037	\$0	6.60	14	16	16	0	2	\$0	\$78	\$0	\$78	\$78
2038	\$0	6.72	15	16	16	0	1	\$0	\$78	\$0	\$78	\$78
2039	\$0	6.85	15	16	16	0	1	\$0	\$78	\$0	\$78	\$78
2040	\$0	6.98	15	16	16	0	1	\$0	\$78	\$0	\$78	\$78
2041	\$0	7.12	15	16	16	0	1	\$0	\$78	\$0	\$78	\$78
2042	\$0	7.26	15	16	16	0	1	\$0	\$78	\$0	\$78	\$78
2043	\$0	7.40	15	16	16	0	1	\$0	\$78	\$0	\$78	\$78
2044	\$0	7.55	15	16	16	0	1	\$0	\$78	\$0	\$78	\$78
2045	\$0	7.71	16	16	16	0	0	\$0	\$78	\$0	\$78	\$78
2046	\$0	7.87	16	16	16	0	0	\$0	\$78	\$0	\$78	\$78
2047	\$0	8.04	16	16	16	0	0	\$0	\$78	\$0	\$78	\$78
2048	\$0	8.21	16	16	16	0	0	\$0	\$78	\$0	\$78	\$78
2049	\$0	8.38	16	16	20	0	0	\$0	\$78	\$0	\$78	\$78
2050	\$0	8.57	16	16	20	0	0	\$0	\$78	\$0	\$78	\$78

Scenario 1

PIPE 6 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2005	2003	310	15	\$16.50	\$5,115	6	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$5,115	0.00	0	0	0	0	0	\$0	\$0	\$5,115	\$0	\$5,115
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.06	2	10	10	0	8	\$3,100	\$78	\$3,100	\$78	\$3,178
2006	\$0	0.09	2	10	10	0	8	\$0	\$78	\$0	\$78	\$78
2007	\$0	0.13	2	10	10	0	8	\$0	\$78	\$0	\$78	\$78
2008	\$0	0.17	3	10	10	0	7	\$0	\$78	\$0	\$78	\$78
2009	\$0	0.22	3	10	10	0	7	\$0	\$78	\$0	\$78	\$78
2010	\$0	0.26	3	10	10	0	7	\$0	\$78	\$0	\$78	\$78
2011	\$0	1.35	7	10	10	0	3	\$0	\$78	\$0	\$78	\$78
2012	\$0	1.40	7	10	10	0	3	\$0	\$78	\$0	\$78	\$78
2013	\$0	1.45	7	10	10	0	3	\$0	\$78	\$0	\$78	\$78
2014	\$0	1.50	7	10	10	0	3	\$0	\$78	\$0	\$78	\$78
2015	\$0	1.55	7	10	10	0	3	\$0	\$78	\$0	\$78	\$78
2016	\$0	1.60	7	10	10	0	3	\$0	\$78	\$0	\$78	\$78
2017	\$0	1.65	7	10	10	0	3	\$0	\$78	\$0	\$78	\$78
2018	\$0	1.71	8	10	16	0	2	\$0	\$78	\$0	\$78	\$78
2019	\$0	1.77	8	10	16	0	2	\$0	\$78	\$0	\$78	\$78
2020	\$0	1.83	8	10	16	0	2	\$0	\$78	\$0	\$78	\$78
2021	\$0	1.89	8	10	16	0	2	\$0	\$78	\$0	\$78	\$78
2022	\$0	1.95	8	10	16	0	2	\$0	\$78	\$0	\$78	\$78
2023	\$0	2.02	8	10	16	0	2	\$0	\$78	\$0	\$78	\$78
2024	\$0	2.09	8	10	16	0	2	\$0	\$78	\$0	\$78	\$78
2025	\$0	2.16	8	10	16	0	2	\$0	\$78	\$0	\$78	\$78
2026	\$0	2.23	9	10	16	0	1	\$0	\$78	\$0	\$78	\$78
2027	\$0	2.31	9	10	16	0	1	\$0	\$78	\$0	\$78	\$78
2028	\$0	2.39	9	10	16	0	1	\$0	\$78	\$0	\$78	\$78
2029	\$0	2.47	9	10	16	0	1	\$0	\$78	\$0	\$78	\$78
2030	\$0	2.55	9	10	16	0	1	\$0	\$78	\$0	\$78	\$78
2031	\$0	2.64	9	10	16	0	1	\$0	\$78	\$0	\$78	\$78
2032	\$0	2.73	9	10	16	0	1	\$0	\$78	\$0	\$78	\$78
2033	\$0	2.82	10	16	16	0	6	\$4,960	\$78	\$4,960	\$78	\$5,038
2034	\$0	2.92	10	16	16	0	6	\$0	\$78	\$0	\$78	\$78
2035	\$0	3.02	10	16	16	0	6	\$0	\$78	\$0	\$78	\$78
2036	\$0	3.12	10	16	16	0	6	\$0	\$78	\$0	\$78	\$78
2037	\$0	3.23	10	16	16	0	6	\$0	\$78	\$0	\$78	\$78
2038	\$0	3.34	10	16	16	0	6	\$0	\$78	\$0	\$78	\$78
2039	\$0	3.45	11	16	16	0	5	\$0	\$78	\$0	\$78	\$78
2040	\$0	3.57	11	16	16	0	5	\$0	\$78	\$0	\$78	\$78
2041	\$0	3.69	11	16	16	0	5	\$0	\$78	\$0	\$78	\$78
2042	\$0	3.81	11	16	16	0	5	\$0	\$78	\$0	\$78	\$78
2043	\$0	3.94	11	16	16	0	5	\$0	\$78	\$0	\$78	\$78
2044	\$0	4.08	11	16	16	0	5	\$0	\$78	\$0	\$78	\$78
2045	\$0	4.22	12	16	16	0	4	\$0	\$78	\$0	\$78	\$78
2046	\$0	4.36	12	16	16	0	4	\$0	\$78	\$0	\$78	\$78
2047	\$0	4.51	12	16	16	0	4	\$0	\$78	\$0	\$78	\$78
2048	\$0	4.66	12	16	16	0	4	\$0	\$78	\$0	\$78	\$78
2049	\$0	4.82	12	16	16	0	4	\$0	\$78	\$0	\$78	\$78
2050	\$0	4.98	13	16	16	0	3	\$0	\$78	\$0	\$78	\$78

Scenario 1

PIPE 7 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot
2005	2003	12970	15	\$16.50	\$214,005	7	0.25

Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$214,005	0.00	0	0	0	0	0	\$0	\$0	\$214,005	\$0	\$214,005
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.04	2	6	10	0	4	\$77,820	\$3,243	\$77,820	\$3,243	\$81,063
2006	\$0	0.08	2	6	10	0	4	\$0	\$3,243	\$0	\$3,243	\$3,243
2007	\$0	0.13	2	6	10	0	4	\$0	\$3,243	\$0	\$3,243	\$3,243
2008	\$0	0.18	3	6	10	0	3	\$0	\$3,243	\$0	\$3,243	\$3,243
2009	\$0	0.23	3	6	10	0	3	\$0	\$3,243	\$0	\$3,243	\$3,243
2010	\$0	0.29	3	6	10	0	3	\$0	\$3,243	\$0	\$3,243	\$3,243
2011	\$0	0.90	6	6	10	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2012	\$0	0.97	6	6	10	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2013	\$0	1.04	6	6	10	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2014	\$0	1.11	6	6	10	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2015	\$0	1.37	7	10	10	0	3	\$129,700	\$3,243	\$129,700	\$3,243	\$132,943
2016	\$0	1.47	7	10	10	0	3	\$0	\$3,243	\$0	\$3,243	\$3,243
2017	\$0	1.57	7	10	10	0	3	\$0	\$3,243	\$0	\$3,243	\$3,243
2018	\$0	1.67	8	10	16	0	2	\$0	\$3,243	\$0	\$3,243	\$3,243
2019	\$0	1.79	8	10	16	0	2	\$0	\$3,243	\$0	\$3,243	\$3,243
2020	\$0	1.91	8	10	16	0	2	\$0	\$3,243	\$0	\$3,243	\$3,243
2021	\$0	2.04	8	10	16	0	2	\$0	\$3,243	\$0	\$3,243	\$3,243
2022	\$0	2.19	9	10	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2023	\$0	2.34	9	10	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2024	\$0	2.50	9	10	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2025	\$0	2.67	9	10	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2026	\$0	2.86	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2027	\$0	3.06	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2028	\$0	3.27	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2029	\$0	3.28	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2030	\$0	3.29	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2031	\$0	3.30	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2032	\$0	3.31	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2033	\$0	3.32	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2034	\$0	3.34	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2035	\$0	3.35	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2036	\$0	3.36	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2037	\$0	3.37	10	10	16	0	0	\$0	\$3,243	\$0	\$3,243	\$3,243
2038	\$0	3.39	11	12	16	0	1	\$155,640	\$3,243	\$155,640	\$3,243	\$158,883
2039	\$0	3.40	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2040	\$0	3.41	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2041	\$0	3.43	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2042	\$0	3.44	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2043	\$0	3.46	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2044	\$0	3.47	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2045	\$0	3.49	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2046	\$0	3.51	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2047	\$0	3.53	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2048	\$0	3.55	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2049	\$0	3.56	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243
2050	\$0	3.58	11	12	16	0	1	\$0	\$3,243	\$0	\$3,243	\$3,243

Scenario 1

PIPE 8 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2015	2013	4910	15	\$16.50	\$81,015	8	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.00	0	0	6	0	0	\$0	\$0	\$0	\$0	\$0
2006	\$0	0.00	0	0	6	0	0	\$0	\$0	\$0	\$0	\$0
2007	\$0	0.00	0	0	6	0	0	\$0	\$0	\$0	\$0	\$0
2008	\$0	0.00	0	0	6	0	0	\$0	\$0	\$0	\$0	\$0
2009	\$0	0.00	0	0	6	0	0	\$0	\$0	\$0	\$0	\$0
2010	\$0	0.00	0	0	6	0	0	\$0	\$0	\$0	\$0	\$0
2011	\$0	0.00	0	0	6	0	0	\$0	\$0	\$0	\$0	\$0
2012	\$0	0.00	0	0	6	0	0	\$0	\$0	\$0	\$0	\$0
2013	\$81,015	0.00	0	0	6	0	0	\$0	\$0	\$81,015	\$0	\$81,015
2014	\$0	0.00	0	0	6	0	0	\$0	\$0	\$0	\$0	\$0
2015	\$0	0.18	3	6	10	0	3	\$29,460	\$1,228	\$29,460	\$1,228	\$30,688
2016	\$0	0.19	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2017	\$0	0.19	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2018	\$0	0.20	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2019	\$0	0.21	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2020	\$0	0.21	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2021	\$0	0.22	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2022	\$0	0.23	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2023	\$0	0.24	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2024	\$0	0.24	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2025	\$0	0.25	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2026	\$0	0.26	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2027	\$0	0.27	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2028	\$0	0.28	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2029	\$0	0.29	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2030	\$0	0.30	3	6	10	0	3	\$0	\$1,228	\$0	\$1,228	\$1,228
2031	\$0	0.31	4	6	10	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2032	\$0	0.32	4	6	10	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2033	\$0	0.33	4	6	10	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2034	\$0	0.34	4	6	10	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2035	\$0	0.35	4	6	10	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2036	\$0	0.37	4	6	10	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2037	\$0	0.38	4	6	10	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2038	\$0	0.39	4	6	12	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2039	\$0	0.41	4	6	12	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2040	\$0	0.42	4	6	12	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2041	\$0	0.43	4	6	12	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2042	\$0	0.45	4	6	12	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2043	\$0	0.47	4	6	12	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2044	\$0	0.48	4	6	12	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2045	\$0	0.50	4	6	12	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2046	\$0	0.52	4	6	12	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2047	\$0	0.53	4	6	12	0	2	\$0	\$1,228	\$0	\$1,228	\$1,228
2048	\$0	0.55	5	6	12	0	1	\$0	\$1,228	\$0	\$1,228	\$1,228
2049	\$0	0.57	5	6	12	0	1	\$0	\$1,228	\$0	\$1,228	\$1,228
2050	\$0	0.59	5	6	12	0	1	\$0	\$1,228	\$0	\$1,228	\$1,228

Scenario 1

PIPE 9 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct	Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot				
2005	2003	6660	15	\$16.50	\$109,890	9	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$109,890	0.00	0	0	0	0	0	\$0	\$0	\$109,890	\$0	\$109,890
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.04	2	6	6	0	4	\$39,960	\$1,665	\$39,960	\$1,665	\$41,625
2006	\$0	0.08	2	6	6	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2007	\$0	0.13	2	6	6	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2008	\$0	0.18	3	6	6	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2009	\$0	0.23	3	6	6	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2010	\$0	0.29	3	6	6	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2011	\$0	0.90	6	6	6	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2012	\$0	0.97	6	6	6	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2013	\$0	1.04	6	6	6	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2014	\$0	1.11	6	6	6	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2015	\$0	1.19	6	6	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2016	\$0	1.28	7	10	10	0	3	\$66,600	\$1,665	\$66,600	\$1,665	\$68,265
2017	\$0	1.38	7	10	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2018	\$0	1.48	7	10	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2019	\$0	1.58	7	10	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2020	\$0	1.70	8	10	10	0	2	\$0	\$1,665	\$0	\$1,665	\$1,665
2021	\$0	1.82	8	10	10	0	2	\$0	\$1,665	\$0	\$1,665	\$1,665
2022	\$0	1.96	8	10	10	0	2	\$0	\$1,665	\$0	\$1,665	\$1,665
2023	\$0	2.10	8	10	10	0	2	\$0	\$1,665	\$0	\$1,665	\$1,665
2024	\$0	2.25	9	10	10	0	1	\$0	\$1,665	\$0	\$1,665	\$1,665
2025	\$0	2.42	9	10	10	0	1	\$0	\$1,665	\$0	\$1,665	\$1,665
2026	\$0	2.60	9	10	10	0	1	\$0	\$1,665	\$0	\$1,665	\$1,665
2027	\$0	2.79	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2028	\$0	2.99	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2029	\$0	2.99	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2030	\$0	2.99	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2031	\$0	2.99	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2032	\$0	2.99	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2033	\$0	2.99	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2034	\$0	2.99	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2035	\$0	2.99	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2036	\$0	2.99	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2037	\$0	2.99	10	10	10	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2038	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2039	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2040	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2041	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2042	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2043	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2044	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2045	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2046	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2047	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2048	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2049	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665
2050	\$0	2.99	10	10	12	0	0	\$0	\$1,665	\$0	\$1,665	\$1,665

Scenario 1

PIPE 10 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct	Lineal Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2005	2003	2820	15	\$16.50	\$46,530	10	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$46,530	0.00	0	0	0	0	0	\$0	\$0	\$46,530	\$0	\$46,530
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.21	3	10	10	0	7	\$28,200	\$0	\$28,200	\$0	\$28,200
2006	\$0	0.22	3	10	10	0	7	\$0	\$0	\$0	\$0	\$0
2007	\$0	0.24	3	10	10	0	7	\$0	\$0	\$0	\$0	\$0
2008	\$0	0.26	3	10	10	0	7	\$0	\$0	\$0	\$0	\$0
2009	\$0	0.29	3	10	10	0	7	\$0	\$0	\$0	\$0	\$0
2010	\$0	0.31	4	10	10	0	6	\$0	\$0	\$0	\$0	\$0
2011	\$0	0.68	5	10	10	0	5	\$0	\$0	\$0	\$0	\$0
2012	\$0	0.70	5	10	10	0	5	\$0	\$0	\$0	\$0	\$0
2013	\$0	0.73	5	10	10	0	5	\$0	\$0	\$0	\$0	\$0
2014	\$0	0.75	5	10	10	0	5	\$0	\$0	\$0	\$0	\$0
2015	\$0	1.52	7	10	16	0	3	\$0	\$0	\$0	\$0	\$0
2016	\$0	1.57	7	10	16	0	3	\$0	\$0	\$0	\$0	\$0
2017	\$0	1.62	7	10	16	0	3	\$0	\$0	\$0	\$0	\$0
2018	\$0	1.68	8	10	16	0	2	\$0	\$0	\$0	\$0	\$0
2019	\$0	1.74	8	10	16	0	2	\$0	\$0	\$0	\$0	\$0
2020	\$0	1.90	8	10	16	0	2	\$0	\$0	\$0	\$0	\$0
2021	\$0	1.97	8	10	16	0	2	\$0	\$0	\$0	\$0	\$0
2022	\$0	2.03	8	10	16	0	2	\$0	\$0	\$0	\$0	\$0
2023	\$0	2.10	8	10	16	0	2	\$0	\$0	\$0	\$0	\$0
2024	\$0	2.17	9	10	16	0	1	\$0	\$0	\$0	\$0	\$0
2025	\$0	3.19	10	10	16	0	0	\$0	\$0	\$0	\$0	\$0
2026	\$0	3.29	10	10	16	0	0	\$0	\$0	\$0	\$0	\$0
2027	\$0	3.39	11	16	20	0	5	\$45,120	\$0	\$45,120	\$0	\$45,120
2028	\$0	3.50	11	16	20	0	5	\$0	\$0	\$0	\$0	\$0
2029	\$0	3.61	11	16	20	0	5	\$0	\$0	\$0	\$0	\$0
2030	\$0	3.73	11	16	20	0	5	\$0	\$0	\$0	\$0	\$0
2031	\$0	3.84	11	16	20	0	5	\$0	\$0	\$0	\$0	\$0
2032	\$0	3.97	11	16	20	0	5	\$0	\$0	\$0	\$0	\$0
2033	\$0	4.09	12	16	20	0	4	\$0	\$0	\$0	\$0	\$0
2034	\$0	4.22	12	16	20	0	4	\$0	\$0	\$0	\$0	\$0
2035	\$0	4.33	12	16	20	0	4	\$0	\$0	\$0	\$0	\$0
2036	\$0	4.42	12	16	20	0	4	\$0	\$0	\$0	\$0	\$0
2037	\$0	4.51	12	16	20	0	4	\$0	\$0	\$0	\$0	\$0
2038	\$0	4.60	12	16	20	0	4	\$0	\$0	\$0	\$0	\$0
2039	\$0	4.70	12	16	20	0	4	\$0	\$0	\$0	\$0	\$0
2040	\$0	4.80	12	16	20	0	4	\$0	\$0	\$0	\$0	\$0
2041	\$0	4.90	13	16	20	0	3	\$0	\$0	\$0	\$0	\$0
2042	\$0	5.00	13	16	20	0	3	\$0	\$0	\$0	\$0	\$0
2043	\$0	5.11	13	16	20	0	3	\$0	\$0	\$0	\$0	\$0
2044	\$0	5.22	13	16	20	0	3	\$0	\$0	\$0	\$0	\$0
2045	\$0	5.34	13	16	20	0	3	\$0	\$0	\$0	\$0	\$0
2046	\$0	5.46	13	16	24	0	3	\$0	\$0	\$0	\$0	\$0
2047	\$0	5.58	13	16	24	0	3	\$0	\$0	\$0	\$0	\$0
2048	\$0	5.71	13	16	24	0	3	\$0	\$0	\$0	\$0	\$0
2049	\$0	5.84	14	16	24	0	2	\$0	\$0	\$0	\$0	\$0
2050	\$0	5.97	14	16	24	0	2	\$0	\$0	\$0	\$0	\$0

Scenario 1												
PIPE 11 COSTS												
(All cost amounts shown are in current Dollars)												
Year of First Use	Year to Construct Line	Linear Feet	Row/Easement Width (ft.)	Land Cost Per L.F.	Land Cost		Pipe Number	Cost Per Foot				
2005	2003	2080	15	\$16.50	\$34,320		11	0.25				
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$34,320	0.00	0	0	0	0	0	\$0	\$0	\$34,320	\$0	\$34,320
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.21	3	6	10	0	3	\$12,480	\$520	\$12,480	\$520	\$13,000
2006	\$0	0.22	3	6	10	0	3	\$0	\$520	\$0	\$520	\$520
2007	\$0	0.24	3	6	10	0	3	\$0	\$520	\$0	\$520	\$520
2008	\$0	0.26	3	6	10	0	3	\$0	\$520	\$0	\$520	\$520
2009	\$0	0.29	3	6	10	0	3	\$0	\$520	\$0	\$520	\$520
2010	\$0	0.31	4	6	10	0	2	\$0	\$520	\$0	\$520	\$520
2011	\$0	0.68	5	6	10	0	1	\$0	\$520	\$0	\$520	\$520
2012	\$0	0.70	5	6	10	0	1	\$0	\$520	\$0	\$520	\$520
2013	\$0	0.73	5	6	10	0	1	\$0	\$520	\$0	\$520	\$520
2014	\$0	0.75	5	6	10	0	1	\$0	\$520	\$0	\$520	\$520
2015	\$0	0.78	5	6	10	0	1	\$0	\$520	\$0	\$520	\$520
2016	\$0	0.80	5	6	10	0	1	\$0	\$520	\$0	\$520	\$520
2017	\$0	0.83	5	6	10	0	1	\$0	\$520	\$0	\$520	\$520
2018	\$0	0.86	6	6	10	0	0	\$0	\$520	\$0	\$520	\$520
2019	\$0	0.89	6	6	10	0	0	\$0	\$520	\$0	\$520	\$520
2020	\$0	0.92	6	6	10	0	0	\$0	\$520	\$0	\$520	\$520
2021	\$0	0.95	6	6	10	0	0	\$0	\$520	\$0	\$520	\$520
2022	\$0	0.98	6	6	10	0	0	\$0	\$520	\$0	\$520	\$520
2023	\$0	1.01	6	6	10	0	0	\$0	\$520	\$0	\$520	\$520
2024	\$0	1.05	6	6	10	0	0	\$0	\$520	\$0	\$520	\$520
2025	\$0	1.08	6	6	10	0	0	\$0	\$520	\$0	\$520	\$520
2026	\$0	1.12	6	6	10	0	0	\$0	\$520	\$0	\$520	\$520
2027	\$0	1.16	6	6	16	0	0	\$0	\$520	\$0	\$520	\$520
2028	\$0	1.20	6	6	16	0	0	\$0	\$520	\$0	\$520	\$520
2029	\$0	1.24	7	8	16	0	1	\$16,640	\$520	\$16,640	\$520	\$17,160
2030	\$0	1.28	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2031	\$0	1.33	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2032	\$0	1.37	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2033	\$0	1.42	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2034	\$0	1.47	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2035	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2036	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2037	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2038	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2039	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2040	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2041	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2042	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2043	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2044	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2045	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2046	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2047	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2048	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2049	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520
2050	\$0	1.49	7	8	16	0	1	\$0	\$520	\$0	\$520	\$520

Scenario 1

PIPE 12 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2015	2013	1480	15	\$16.50	\$24,420	12	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2006	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2007	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2008	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2009	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2010	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2011	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2012	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2013	\$24,420	0.00	0	0	10	0	0	\$0	\$0	\$24,420	\$0	\$24,420
2014	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2015	\$0	0.74	5	10	10	0	5	\$14,800	\$370	\$14,800	\$370	\$15,170
2016	\$0	0.77	5	10	10	0	5	\$0	\$370	\$0	\$370	\$370
2017	\$0	0.79	5	10	10	0	5	\$0	\$370	\$0	\$370	\$370
2018	\$0	0.82	5	10	10	0	5	\$0	\$370	\$0	\$370	\$370
2019	\$0	0.85	6	10	10	0	4	\$0	\$370	\$0	\$370	\$370
2020	\$0	0.99	6	10	10	0	4	\$0	\$370	\$0	\$370	\$370
2021	\$0	1.02	6	10	10	0	4	\$0	\$370	\$0	\$370	\$370
2022	\$0	1.05	6	10	10	0	4	\$0	\$370	\$0	\$370	\$370
2023	\$0	1.08	6	10	10	0	4	\$0	\$370	\$0	\$370	\$370
2024	\$0	1.12	6	10	10	0	4	\$0	\$370	\$0	\$370	\$370
2025	\$0	2.10	8	10	10	0	2	\$0	\$370	\$0	\$370	\$370
2026	\$0	2.17	9	10	10	0	1	\$0	\$370	\$0	\$370	\$370
2027	\$0	2.23	9	10	16	0	1	\$0	\$370	\$0	\$370	\$370
2028	\$0	2.30	9	10	16	0	1	\$0	\$370	\$0	\$370	\$370
2029	\$0	2.37	9	10	16	0	1	\$0	\$370	\$0	\$370	\$370
2030	\$0	2.44	9	10	16	0	1	\$0	\$370	\$0	\$370	\$370
2031	\$0	2.52	9	10	16	0	1	\$0	\$370	\$0	\$370	\$370
2032	\$0	2.60	9	10	16	0	1	\$0	\$370	\$0	\$370	\$370
2033	\$0	2.68	9	10	16	0	1	\$0	\$370	\$0	\$370	\$370
2034	\$0	2.76	10	10	16	0	0	\$0	\$370	\$0	\$370	\$370
2035	\$0	2.84	10	10	16	0	0	\$0	\$370	\$0	\$370	\$370
2036	\$0	2.93	10	10	16	0	0	\$0	\$370	\$0	\$370	\$370
2037	\$0	3.02	10	10	16	0	0	\$0	\$370	\$0	\$370	\$370
2038	\$0	3.11	10	10	16	0	0	\$0	\$370	\$0	\$370	\$370
2039	\$0	3.21	10	10	16	0	0	\$0	\$370	\$0	\$370	\$370
2040	\$0	3.31	10	10	16	0	0	\$0	\$370	\$0	\$370	\$370
2041	\$0	3.41	11	16	16	0	5	\$23,680	\$370	\$23,680	\$370	\$24,050
2042	\$0	3.51	11	16	16	0	5	\$0	\$370	\$0	\$370	\$370
2043	\$0	3.62	11	16	16	0	5	\$0	\$370	\$0	\$370	\$370
2044	\$0	3.73	11	16	16	0	5	\$0	\$370	\$0	\$370	\$370
2045	\$0	3.85	11	16	16	0	5	\$0	\$370	\$0	\$370	\$370
2046	\$0	3.97	11	16	16	0	5	\$0	\$370	\$0	\$370	\$370
2047	\$0	4.09	12	16	16	0	4	\$0	\$370	\$0	\$370	\$370
2048	\$0	4.22	12	16	16	0	4	\$0	\$370	\$0	\$370	\$370
2049	\$0	4.35	12	16	16	0	4	\$0	\$370	\$0	\$370	\$370
2050	\$0	4.48	12	16	16	0	4	\$0	\$370	\$0	\$370	\$370

Scenario 1

PIPE 13 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2015	2013	10690	15	\$16.50	\$176,385	13	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2006	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2007	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2008	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2009	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2010	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2011	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2012	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2013	\$176,385	0.00	0	0	0	0	0	\$0	\$0	\$176,385	\$0	\$176,385
2014	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2015	\$0	0.45	4	8	10	0	4	\$85,520	\$2,673	\$85,520	\$2,673	\$88,193
2016	\$0	0.47	4	8	10	0	4	\$0	\$2,673	\$0	\$2,673	\$2,673
2017	\$0	0.49	4	8	10	0	4	\$0	\$2,673	\$0	\$2,673	\$2,673
2018	\$0	0.50	4	8	10	0	4	\$0	\$2,673	\$0	\$2,673	\$2,673
2019	\$0	0.52	4	8	10	0	4	\$0	\$2,673	\$0	\$2,673	\$2,673
2020	\$0	0.54	4	8	10	0	4	\$0	\$2,673	\$0	\$2,673	\$2,673
2021	\$0	0.56	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2022	\$0	0.58	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2023	\$0	0.60	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2024	\$0	0.62	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2025	\$0	0.64	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2026	\$0	0.66	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2027	\$0	0.68	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2028	\$0	0.71	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2029	\$0	0.73	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2030	\$0	0.76	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2031	\$0	0.78	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2032	\$0	0.81	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2033	\$0	0.84	5	8	10	0	3	\$0	\$2,673	\$0	\$2,673	\$2,673
2034	\$0	0.87	6	8	10	0	2	\$0	\$2,673	\$0	\$2,673	\$2,673
2035	\$0	0.90	6	8	10	0	2	\$0	\$2,673	\$0	\$2,673	\$2,673
2036	\$0	0.93	6	8	10	0	2	\$0	\$2,673	\$0	\$2,673	\$2,673
2037	\$0	0.96	6	8	10	0	2	\$0	\$2,673	\$0	\$2,673	\$2,673
2038	\$0	1.00	6	8	10	0	2	\$0	\$2,673	\$0	\$2,673	\$2,673
2039	\$0	1.03	6	8	10	0	2	\$0	\$2,673	\$0	\$2,673	\$2,673
2040	\$0	1.07	6	8	10	0	2	\$0	\$2,673	\$0	\$2,673	\$2,673
2041	\$0	1.10	6	8	16	0	2	\$0	\$2,673	\$0	\$2,673	\$2,673
2042	\$0	1.14	6	8	16	0	2	\$0	\$2,673	\$0	\$2,673	\$2,673
2043	\$0	1.18	6	8	16	0	2	\$0	\$2,673	\$0	\$2,673	\$2,673
2044	\$0	1.22	7	8	16	0	1	\$0	\$2,673	\$0	\$2,673	\$2,673
2045	\$0	1.26	7	8	16	0	1	\$0	\$2,673	\$0	\$2,673	\$2,673
2046	\$0	1.31	7	8	16	0	1	\$0	\$2,673	\$0	\$2,673	\$2,673
2047	\$0	1.35	7	8	16	0	1	\$0	\$2,673	\$0	\$2,673	\$2,673
2048	\$0	1.40	7	8	16	0	1	\$0	\$2,673	\$0	\$2,673	\$2,673
2049	\$0	1.45	7	8	16	0	1	\$0	\$2,673	\$0	\$2,673	\$2,673
2050	\$0	1.50	7	8	16	0	1	\$0	\$2,673	\$0	\$2,673	\$2,673

Scenario 1

PIPE 14 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2015	2013	3190	15	\$16.50	\$52,635	14	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2006	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2007	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2008	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2009	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2010	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2011	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2012	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2013	\$52,635	0.00	0	0	0	0	0	\$0	\$0	\$52,635	\$0	\$52,635
2014	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2015	\$0	0.29	3	10	10	0	7	\$31,900	\$798	\$31,900	\$798	\$32,698
2016	\$0	0.30	3	10	10	0	7	\$0	\$798	\$0	\$798	\$798
2017	\$0	0.31	4	10	10	0	6	\$0	\$798	\$0	\$798	\$798
2018	\$0	0.32	4	10	10	0	6	\$0	\$798	\$0	\$798	\$798
2019	\$0	0.33	4	10	10	0	6	\$0	\$798	\$0	\$798	\$798
2020	\$0	0.45	4	10	10	0	6	\$0	\$798	\$0	\$798	\$798
2021	\$0	0.46	4	10	10	0	6	\$0	\$798	\$0	\$798	\$798
2022	\$0	0.47	4	10	10	0	6	\$0	\$798	\$0	\$798	\$798
2023	\$0	0.49	4	10	10	0	6	\$0	\$798	\$0	\$798	\$798
2024	\$0	0.50	4	10	10	0	6	\$0	\$798	\$0	\$798	\$798
2025	\$0	1.46	7	10	10	0	3	\$0	\$798	\$0	\$798	\$798
2026	\$0	1.51	7	10	10	0	3	\$0	\$798	\$0	\$798	\$798
2027	\$0	1.55	7	10	10	0	3	\$0	\$798	\$0	\$798	\$798
2028	\$0	1.59	7	10	10	0	3	\$0	\$798	\$0	\$798	\$798
2029	\$0	1.64	7	10	10	0	3	\$0	\$798	\$0	\$798	\$798
2030	\$0	1.69	8	10	10	0	2	\$0	\$798	\$0	\$798	\$798
2031	\$0	1.73	8	10	10	0	2	\$0	\$798	\$0	\$798	\$798
2032	\$0	1.78	8	10	10	0	2	\$0	\$798	\$0	\$798	\$798
2033	\$0	1.84	8	10	10	0	2	\$0	\$798	\$0	\$798	\$798
2034	\$0	1.89	8	10	10	0	2	\$0	\$798	\$0	\$798	\$798
2035	\$0	1.94	8	10	10	0	2	\$0	\$798	\$0	\$798	\$798
2036	\$0	2.00	8	10	10	0	2	\$0	\$798	\$0	\$798	\$798
2037	\$0	2.06	8	10	10	0	2	\$0	\$798	\$0	\$798	\$798
2038	\$0	2.12	8	10	10	0	2	\$0	\$798	\$0	\$798	\$798
2039	\$0	2.18	9	10	10	0	1	\$0	\$798	\$0	\$798	\$798
2040	\$0	2.24	9	10	10	0	1	\$0	\$798	\$0	\$798	\$798
2041	\$0	2.31	9	10	16	0	1	\$0	\$798	\$0	\$798	\$798
2042	\$0	2.37	9	10	16	0	1	\$0	\$798	\$0	\$798	\$798
2043	\$0	2.44	9	10	16	0	1	\$0	\$798	\$0	\$798	\$798
2044	\$0	2.51	9	10	16	0	1	\$0	\$798	\$0	\$798	\$798
2045	\$0	2.59	9	10	16	0	1	\$0	\$798	\$0	\$798	\$798
2046	\$0	2.66	9	10	16	0	1	\$0	\$798	\$0	\$798	\$798
2047	\$0	2.74	10	10	16	0	0	\$0	\$798	\$0	\$798	\$798
2048	\$0	2.82	10	10	16	0	0	\$0	\$798	\$0	\$798	\$798
2049	\$0	2.90	10	10	16	0	0	\$0	\$798	\$0	\$798	\$798
2050	\$0	2.99	10	10	16	0	0	\$0	\$798	\$0	\$798	\$798

Scenario 1

PIPE 15 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct	Linear Feet	Row/Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2015	2013	6660	15	\$16.50	\$109,890	15	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2006	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2007	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2008	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2009	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2010	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2011	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2012	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2013	\$109,890	0.00	0	0	0	0	0	\$0	\$0	\$109,890	\$0	\$109,890
2014	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2015	\$0	0.29	3	8	10	0	5	\$53,280	\$1,665	\$53,280	\$1,665	\$54,945
2016	\$0	0.30	3	8	10	0	5	\$0	\$1,665	\$0	\$1,665	\$1,665
2017	\$0	0.31	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2018	\$0	0.32	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2019	\$0	0.33	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2020	\$0	0.34	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2021	\$0	0.35	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2022	\$0	0.36	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2023	\$0	0.38	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2024	\$0	0.39	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2025	\$0	0.40	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2026	\$0	0.42	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2027	\$0	0.43	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2028	\$0	0.45	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2029	\$0	0.46	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2030	\$0	0.48	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2031	\$0	0.49	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2032	\$0	0.51	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2033	\$0	0.53	4	8	10	0	4	\$0	\$1,665	\$0	\$1,665	\$1,665
2034	\$0	0.55	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2035	\$0	0.57	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2036	\$0	0.59	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2037	\$0	0.61	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2038	\$0	0.63	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2039	\$0	0.65	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2040	\$0	0.67	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2041	\$0	0.69	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2042	\$0	0.72	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2043	\$0	0.74	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2044	\$0	0.77	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2045	\$0	0.80	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2046	\$0	0.82	5	8	10	0	3	\$0	\$1,665	\$0	\$1,665	\$1,665
2047	\$0	0.85	6	8	10	0	2	\$0	\$1,665	\$0	\$1,665	\$1,665
2048	\$0	0.88	6	8	10	0	2	\$0	\$1,665	\$0	\$1,665	\$1,665
2049	\$0	0.91	6	8	10	0	2	\$0	\$1,665	\$0	\$1,665	\$1,665
2050	\$0	0.94	6	8	10	0	2	\$0	\$1,665	\$0	\$1,665	\$1,665

Scenario 1

PIPE 16 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2020	2018	37910	15	\$16.50	\$625,515	16	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2006	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2007	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2008	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2009	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2010	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2011	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2012	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2013	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2014	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2015	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2016	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2017	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2018	\$625,515	0.00	0	0	10	0	0	\$0	\$0	\$625,515	\$0	\$625,515
2019	\$0	0.00	0	0	10	0	0	\$0	\$0	\$0	\$0	\$0
2020	\$0	0.11	2	8	10	0	6	\$303,280	\$9,478	\$303,280	\$9,478	\$312,758
2021	\$0	0.11	2	8	10	0	6	\$0	\$9,478	\$0	\$9,478	\$9,478
2022	\$0	0.11	2	8	10	0	6	\$0	\$9,478	\$0	\$9,478	\$9,478
2023	\$0	0.11	2	8	10	0	6	\$0	\$9,478	\$0	\$9,478	\$9,478
2024	\$0	0.11	2	8	10	0	6	\$0	\$9,478	\$0	\$9,478	\$9,478
2025	\$0	1.06	6	8	10	0	2	\$0	\$9,478	\$0	\$9,478	\$9,478
2026	\$0	1.09	6	8	10	0	2	\$0	\$9,478	\$0	\$9,478	\$9,478
2027	\$0	1.12	6	8	10	0	2	\$0	\$9,478	\$0	\$9,478	\$9,478
2028	\$0	1.15	6	8	10	0	2	\$0	\$9,478	\$0	\$9,478	\$9,478
2029	\$0	1.18	6	8	10	0	2	\$0	\$9,478	\$0	\$9,478	\$9,478
2030	\$0	1.21	6	8	10	0	2	\$0	\$9,478	\$0	\$9,478	\$9,478
2031	\$0	1.24	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2032	\$0	1.27	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2033	\$0	1.31	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2034	\$0	1.34	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2035	\$0	1.38	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2036	\$0	1.41	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2037	\$0	1.45	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2038	\$0	1.49	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2039	\$0	1.53	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2040	\$0	1.57	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2041	\$0	1.61	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2042	\$0	1.66	7	8	10	0	1	\$0	\$9,478	\$0	\$9,478	\$9,478
2043	\$0	1.70	8	8	10	0	0	\$0	\$9,478	\$0	\$9,478	\$9,478
2044	\$0	1.74	8	8	10	0	0	\$0	\$9,478	\$0	\$9,478	\$9,478
2045	\$0	1.79	8	8	10	0	0	\$0	\$9,478	\$0	\$9,478	\$9,478
2046	\$0	1.84	8	8	10	0	0	\$0	\$9,478	\$0	\$9,478	\$9,478
2047	\$0	1.89	8	8	10	0	0	\$0	\$9,478	\$0	\$9,478	\$9,478
2048	\$0	1.94	8	8	10	0	0	\$0	\$9,478	\$0	\$9,478	\$9,478
2049	\$0	1.99	8	8	10	0	0	\$0	\$9,478	\$0	\$9,478	\$9,478
2050	\$0	2.04	8	8	10	0	0	\$0	\$9,478	\$0	\$9,478	\$9,478

Scenario 1

PIPE 17 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2020	2018	6400	15	\$16.50	\$105,600	17	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2006	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2007	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2008	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2009	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2010	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2011	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2012	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2013	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2014	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2015	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2016	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2017	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2018	\$105,600	0.00	0	0	0	0	0	\$0	\$0	\$105,600	\$0	\$105,600
2019	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2020	\$0	0.11	2	6	8	0	4	\$38,400	\$1,600	\$38,400	\$1,600	\$40,000
2021	\$0	0.11	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2022	\$0	0.11	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2023	\$0	0.11	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2024	\$0	0.11	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2025	\$0	0.11	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2026	\$0	0.12	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2027	\$0	0.12	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2028	\$0	0.12	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2029	\$0	0.12	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2030	\$0	0.12	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2031	\$0	0.12	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2032	\$0	0.12	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2033	\$0	0.13	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2034	\$0	0.13	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2035	\$0	0.13	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2036	\$0	0.13	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2037	\$0	0.13	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2038	\$0	0.13	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2039	\$0	0.13	2	6	8	0	4	\$0	\$1,600	\$0	\$1,600	\$1,600
2040	\$0	0.14	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600
2041	\$0	0.14	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600
2042	\$0	0.14	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600
2043	\$0	0.14	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600
2044	\$0	0.14	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600
2045	\$0	0.14	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600
2046	\$0	0.15	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600
2047	\$0	0.15	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600
2048	\$0	0.15	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600
2049	\$0	0.15	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600
2050	\$0	0.15	3	6	8	0	3	\$0	\$1,600	\$0	\$1,600	\$1,600

Scenario 1

PIPE 18 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2025	2023	17880	15	\$16.50	\$295,020	18	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2006	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2007	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2008	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2009	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2010	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2011	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2012	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2013	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2014	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2015	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2016	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2017	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2018	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2019	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2020	\$0	0.00	0	0	8	0	0	\$0	\$0	\$0	\$0	\$0
2021	\$0	0.00	0	0	8	0	0	\$0	\$0	\$0	\$0	\$0
2022	\$0	0.00	0	0	8	0	0	\$0	\$0	\$0	\$0	\$0
2023	\$295,020	0.00	0	0	8	0	0	\$0	\$0	\$295,020	\$0	\$295,020
2024	\$0	0.00	0	0	8	0	0	\$0	\$0	\$0	\$0	\$0
2025	\$0	0.95	6	8	8	0	2	\$143,040	\$4,470	\$143,040	\$4,470	\$147,510
2026	\$0	0.97	6	8	8	0	2	\$0	\$4,470	\$0	\$4,470	\$4,470
2027	\$0	1.00	6	8	8	0	2	\$0	\$4,470	\$0	\$4,470	\$4,470
2028	\$0	1.03	6	8	8	0	2	\$0	\$4,470	\$0	\$4,470	\$4,470
2029	\$0	1.06	6	8	8	0	2	\$0	\$4,470	\$0	\$4,470	\$4,470
2030	\$0	1.09	6	8	8	0	2	\$0	\$4,470	\$0	\$4,470	\$4,470
2031	\$0	1.12	6	8	8	0	2	\$0	\$4,470	\$0	\$4,470	\$4,470
2032	\$0	1.15	6	8	8	0	2	\$0	\$4,470	\$0	\$4,470	\$4,470
2033	\$0	1.18	6	8	8	0	2	\$0	\$4,470	\$0	\$4,470	\$4,470
2034	\$0	1.22	6	8	8	0	2	\$0	\$4,470	\$0	\$4,470	\$4,470
2035	\$0	1.25	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2036	\$0	1.28	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2037	\$0	1.32	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2038	\$0	1.36	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2039	\$0	1.40	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2040	\$0	1.43	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2041	\$0	1.47	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2042	\$0	1.52	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2043	\$0	1.56	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2044	\$0	1.60	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2045	\$0	1.65	7	8	8	0	1	\$0	\$4,470	\$0	\$4,470	\$4,470
2046	\$0	1.69	8	8	8	0	0	\$0	\$4,470	\$0	\$4,470	\$4,470
2047	\$0	1.74	8	8	8	0	0	\$0	\$4,470	\$0	\$4,470	\$4,470
2048	\$0	1.79	8	8	8	0	0	\$0	\$4,470	\$0	\$4,470	\$4,470
2049	\$0	1.84	8	8	8	0	0	\$0	\$4,470	\$0	\$4,470	\$4,470
2050	\$0	1.89	8	8	8	0	0	\$0	\$4,470	\$0	\$4,470	\$4,470

Scenario 1

WILLOW PARK TOTAL COSTS
(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$196,632	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$447,437
2001	\$0	\$8,754	\$0	\$0	\$1,146	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,900
2002	\$0	\$9,533	\$0	\$0	\$1,210	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,744
2003	\$0	\$10,315	\$57,809	\$0	\$1,270	\$11,331	\$30,991	\$0	\$2,660	\$5,115	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$119,491
2004	\$0	\$11,100	\$0	\$0	\$1,326	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,425
2005	\$28,928	\$12,424	\$1,876,213	\$1,377	\$5,134	\$18,707	\$0	\$1,617	\$3,177	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,424,713
2006	\$94,573	\$13,359	\$26,645	\$17,444	\$1,419	\$122	\$450	\$0	\$39	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$154,129
2007	\$98,757	\$14,305	\$26,098	\$17,084	\$1,456	\$120	\$444	\$0	\$39	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$156,381
2008	\$99,170	\$15,263	\$25,802	\$16,794	\$1,489	\$118	\$438	\$0	\$38	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$158,989
2009	\$101,784	\$16,234	\$25,145	\$16,546	\$1,518	\$116	\$432	\$0	\$38	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$161,300
2010	\$104,811	\$17,232	\$24,766	\$16,325	\$1,545	\$114	\$428	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$165,336
2011	\$352,698	\$22,180	\$1,722,068	\$1,410,781	\$1,570	\$112	\$425	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,508,949
2012	\$110,657	\$22,811	\$73,347	\$37,681	\$1,560	\$110	\$419	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$246,700
2013	\$113,462	\$23,479	\$75,207	\$37,199	\$1,552	\$108	\$414	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$251,534
2014	\$116,620	\$25,383	\$77,300	\$36,816	\$1,544	\$106	\$410	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$308,292
2015	\$151,514	\$26,743	\$100,429	\$41,898	\$1,537	\$6,759	\$407	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$329,391
2016	\$156,940	\$27,651	\$104,026	\$41,671	\$1,535	\$103	\$405	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$332,444
2017	\$162,873	\$246,566	\$107,958	\$41,543	\$1,534	\$102	\$404	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$361,093
2018	\$169,337	\$29,625	\$112,243	\$1,130,695	\$1,533	\$102	\$26,253	\$0	\$2,316	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,472,182
2019	\$176,363	\$30,686	\$116,900	\$46,611	\$1,534	\$101	\$404	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$374,721
2020	\$195,839	\$32,628	\$129,609	\$50,459	\$1,533	\$101	\$405	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$410,790
2021	\$425,022	\$33,756	\$1,623,499	\$50,919	\$1,538	\$101	\$407	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,135,355
2022	\$214,056	\$35,051	\$141,884	\$51,564	\$1,542	\$101	\$410	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$444,721
2023	\$224,276	\$36,417	\$148,658	\$52,390	\$1,546	\$102	\$413	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$463,916
2024	\$235,313	\$37,858	\$155,974	\$53,397	\$1,551	\$102	\$417	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$484,727
2025	\$279,190	\$41,269	\$185,051	\$1,300,554	\$1,557	\$103	\$421	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,808,249
2026	\$294,394	\$43,006	\$195,135	\$67,764	\$1,566	\$104	\$426	\$0	\$38	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$602,509
2027	\$310,817	\$44,639	\$206,021	\$70,158	\$1,576	\$8,491	\$431	\$0	\$38	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$642,449
2028	\$328,558	\$46,774	\$217,780	\$72,849	\$1,586	\$106	\$437	\$0	\$39	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$668,207
2029	\$340,184	\$48,378	\$225,473	\$74,802	\$1,596	\$107	\$444	\$0	\$39	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$691,083
2030	\$52,112	\$103,322	\$233,393	\$76,828	\$1,607	\$109	\$450	\$0	\$40	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$767,938
2031	\$74,510	\$51,749	\$2,468,686	\$1,116,739	\$1,618	\$110	\$457	\$0	\$40	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,566,187
2032	\$374,725	\$53,320	\$248,382	\$96,207	\$1,622	\$111	\$460	\$0	\$40	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$766,945
2033	\$385,321	\$54,948	\$255,405	\$99,616	\$1,627	\$111	\$463	\$0	\$41	\$5,037	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$793,969
2034	\$396,367	\$56,635	\$262,727	\$93,132	\$1,631	\$112	\$466	\$0	\$41	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$811,189
2035	\$406,941	\$58,330	\$269,735	\$95,621	\$1,636	\$113	\$469	\$0	\$41	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$832,964
2036	\$417,014	\$60,033	\$276,412	\$98,062	\$1,641	\$113	\$472	\$0	\$41	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$853,867
2037	\$427,439	\$285,701	\$283,322	\$100,565	\$1,646	\$114	\$475	\$0	\$42	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,106,380
2038	\$438,227	\$63,615	\$290,473	\$103,130	\$1,651	\$115	\$478	\$0	\$42	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$997,809
2039	\$449,394	\$65,498	\$297,875	\$105,762	\$1,656	\$115	\$481	\$0	\$42	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$920,301
2040	\$460,953	\$67,445	\$305,537	\$108,461	\$1,661	\$116	\$484	\$0	\$42	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$944,776
2041	\$472,918	\$69,458	\$313,468	\$111,229	\$1,666	\$117	\$487	\$0	\$43	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$969,463
2042	\$485,305	\$71,540	\$321,678	\$114,002	\$1,671	\$117	\$490	\$0	\$43	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,168,823
2043	\$498,129	\$73,693	\$330,178	\$123,544	\$1,676	\$118	\$493	\$0	\$43	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,027,951
2044	\$511,408	\$75,919	\$338,978	\$125,632	\$1,681	\$119	\$496	\$0	\$44	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,054,552
2045	\$525,153	\$134,112	\$348,091	\$128,192	\$1,686	\$120	\$499	\$0	\$44	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,137,974
2046	\$539,389	\$80,802	\$357,527	\$130,627	\$1,691	\$121	\$502	\$0	\$44	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,122,119
2047	\$554,129	\$83,063	\$367,297	\$133,139	\$1,696	\$121	\$505	\$0	\$44	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,140,072
2048	\$568,395	\$85,609	\$377,416	\$135,730	\$1,701	\$122	\$508	\$0	\$44	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,170,602
2049	\$585,204	\$88,242	\$387,895	\$475,338	\$1,706	\$122	\$41,398	\$0	\$45	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,560,026
2050	\$601,577	\$90,964	\$398,747	\$141,165	\$248,056	\$123	\$514	\$0	\$45	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,481,269

Scenario 1

ALEDO TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$112,769	\$0	\$0	\$143,837	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$256,606
2000	\$0	\$4,952	\$0	\$0	\$648	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,601
2001	\$0	\$5,332	\$0	\$0	\$677	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,009
2002	\$0	\$5,713	\$32,016	\$0	\$703	\$6,275	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$107,823
2003	\$0	\$6,096	\$0	\$0	\$728	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$28,795	\$34,320	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,824
2004	\$0	\$6,774	\$641,804	\$1,309,461	\$751	\$2,799	\$0	\$0	\$0	\$0	\$0	\$0	\$16,735	\$13,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,116,142
2005	\$24,818	\$7,150	\$14,281	\$10,684	\$759	\$66	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$84,039
2006	\$50,958	\$7,534	\$13,745	\$9,838	\$767	\$63	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$83,424
2007	\$51,493	\$7,925	\$13,293	\$9,234	\$773	\$61	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$83,301
2008	\$52,189	\$8,325	\$12,894	\$8,771	\$779	\$59	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$83,546
2009	\$53,153	\$8,738	\$12,559	\$8,401	\$784	\$58	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$84,213
2010	\$177,107	\$11,138	\$664,732	\$708,420	\$788	\$56	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,762,762
2011	\$55,598	\$11,455	\$36,831	\$19,922	\$784	\$55	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$124,132
2012	\$56,975	\$11,790	\$37,785	\$19,679	\$779	\$54	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$126,562
2013	\$58,560	\$12,125	\$38,639	\$19,436	\$774	\$53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$128,992
2014	\$60,245	\$12,460	\$39,493	\$19,193	\$769	\$52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$131,422
2015	\$62,030	\$12,795	\$40,347	\$18,950	\$764	\$51	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$133,852
2016	\$63,915	\$13,130	\$41,201	\$18,707	\$759	\$50	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$136,282
2017	\$65,900	\$13,465	\$42,056	\$18,464	\$754	\$49	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$138,712
2018	\$68,085	\$13,800	\$42,911	\$18,221	\$749	\$48	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$141,142
2019	\$70,370	\$14,135	\$43,766	\$17,978	\$744	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$143,572
2020	\$72,755	\$14,470	\$44,621	\$17,735	\$739	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$146,002
2021	\$75,240	\$14,805	\$45,476	\$17,492	\$734	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$148,432
2022	\$77,825	\$15,140	\$46,331	\$17,249	\$729	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$150,862
2023	\$80,510	\$15,475	\$47,186	\$17,006	\$724	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$153,292
2024	\$83,295	\$15,810	\$48,041	\$16,763	\$719	\$42	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$155,722
2025	\$86,180	\$16,145	\$48,896	\$16,520	\$714	\$41	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$158,152
2026	\$89,165	\$16,480	\$49,751	\$16,277	\$709	\$40	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$160,582
2027	\$92,250	\$16,815	\$50,606	\$16,034	\$704	\$39	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$163,012
2028	\$95,435	\$17,150	\$51,461	\$15,791	\$699	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$165,442
2029	\$98,720	\$17,485	\$52,316	\$15,548	\$694	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$167,872
2030	\$102,105	\$17,820	\$53,171	\$15,305	\$689	\$36	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$170,302
2031	\$105,590	\$18,155	\$54,026	\$15,062	\$684	\$35	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$172,732
2032	\$109,175	\$18,490	\$54,881	\$14,819	\$679	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$175,162
2033	\$112,860	\$18,825	\$55,736	\$14,576	\$674	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$177,592
2034	\$116,645	\$19,160	\$56,591	\$14,333	\$669	\$32	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$180,022
2035	\$120,530	\$19,495	\$57,446	\$14,090	\$664	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$182,452
2036	\$124,515	\$19,830	\$58,301	\$13,847	\$659	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$184,882
2037	\$128,600	\$20,165	\$59,156	\$13,604	\$654	\$29	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$187,312
2038	\$132,785	\$20,500	\$60,011	\$13,361	\$649	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$189,742
2039	\$137,070	\$20,835	\$60,866	\$13,118	\$644	\$27	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$192,172
2040	\$141,455	\$21,170	\$61,721	\$12,875	\$639	\$26	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$194,602
2041	\$145,940	\$21,505	\$62,576	\$12,632	\$634	\$25	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$197,032
2042	\$150,525	\$21,840	\$63,431	\$12,389	\$629	\$24	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$199,462
2043	\$155,210	\$22,175	\$64,286	\$12,146	\$624	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$201,892
2044	\$160,095	\$22,510	\$65,141	\$11,903	\$619	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$204,322
2045	\$165,080	\$22,845	\$66,000	\$11,660	\$614	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$206,752
2046	\$170,165	\$23,180	\$66,855	\$11,417	\$609	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$209,182
2047	\$175,350	\$23,515	\$67,710	\$11,174	\$604	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$211,612
2048	\$180,635	\$23,850	\$68,565	\$10,931	\$599	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$214,042
2049	\$186,020	\$24,185	\$69,420	\$10,688	\$594	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$216,472
2050	\$191,505	\$24,520	\$70,275	\$10,445	\$589	\$16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$218,902

Scenario 1

HUDSON OAKS TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Intake/ Pumping	Raw Water Pumping Treatment	Storage/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$156,796	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$368,790
2000	\$0	\$7,108	\$0	\$189,984	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,038
2001	\$0	\$7,888	\$0	\$930	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,890
2002	\$0	\$8,706	\$48,790	\$0	\$1,002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$402,178
2003	\$0	\$8,562	\$48,790	\$0	\$1,072	\$9,563	\$26,156	\$2,245	\$0	\$185,756	\$0	\$109,890	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,704
2004	\$201,429	\$10,931	\$1,035,733	\$1,482,576	\$1,212	\$4,617	\$16,460	\$1,423	\$0	\$73,924	\$0	\$41,625	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,869,830
2005	\$85,078	\$12,018	\$23,989	\$13,167	\$1,276	\$110	\$405	\$35	\$35	\$2,964	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$140,677
2006	\$89,010	\$13,160	\$24,008	\$13,008	\$1,339	\$110	\$408	\$36	\$36	\$2,963	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$145,696
2007	\$93,315	\$14,362	\$24,090	\$12,921	\$1,401	\$111	\$412	\$36	\$36	\$2,962	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$151,264
2008	\$98,002	\$15,630	\$24,208	\$12,881	\$1,462	\$111	\$416	\$36	\$36	\$2,962	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$157,363
2009	\$102,648	\$16,876	\$24,254	\$12,874	\$1,513	\$111	\$419	\$37	\$37	\$2,961	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$163,346
2010	\$108,660	\$18,089	\$1,707,235	\$1,127,915	\$1,557	\$111	\$421	\$37	\$37	\$2,948	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,213,539
2011	\$112,008	\$23,090	\$1,74,244	\$31,265	\$1,597	\$111	\$424	\$37	\$37	\$2,942	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$247,366
2012	\$116,751	\$24,160	\$177,387	\$32,032	\$1,597	\$111	\$426	\$37	\$37	\$2,927	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$257,099
2013	\$121,502	\$28,538	\$80,536	\$32,850	\$1,609	\$110	\$427	\$38	\$38	\$2,920	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$320,252
2014	\$129,246	\$28,108	\$105,554	\$33,860	\$1,616	\$108	\$428	\$38	\$38	\$2,920	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$418,456
2015	\$165,631	\$29,218	\$109,919	\$40,108	\$1,622	\$108	\$428	\$38	\$38	\$2,920	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$596,141
2016	\$172,462	\$261,083	\$114,314	\$41,498	\$1,624	\$108	\$428	\$38	\$38	\$2,920	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,537,943
2017	\$179,134	\$31,339	\$118,737	\$1,172,196	\$1,622	\$108	\$428	\$38	\$38	\$2,920	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$400,434
2018	\$185,838	\$32,345	\$123,180	\$52,301	\$1,616	\$107	\$426	\$37	\$37	\$2,916	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$437,463
2019	\$204,968	\$34,044	\$135,860	\$55,835	\$1,606	\$106	\$424	\$37	\$37	\$2,916	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$465,987
2020	\$440,596	\$34,993	\$1,682,989	\$57,474	\$1,594	\$105	\$422	\$37	\$37	\$2,910	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,222,789
2021	\$219,177	\$35,889	\$145,279	\$58,929	\$1,579	\$104	\$420	\$37	\$37	\$2,899	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$479,746
2022	\$228,197	\$36,728	\$149,931	\$61,297	\$1,537	\$103	\$417	\$36	\$36	\$2,893	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$493,085
2023	\$233,115	\$37,504	\$154,517	\$61,297	\$1,537	\$101	\$413	\$36	\$36	\$2,885	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$587,356
2024	\$270,886	\$40,043	\$179,555	\$1,481,955	\$1,511	\$100	\$409	\$36	\$36	\$2,876	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$689,743
2025	\$278,960	\$40,752	\$184,905	\$1,481,955	\$1,484	\$98	\$404	\$36	\$36	\$2,868	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$815,671
2026	\$286,748	\$41,367	\$190,067	\$1,481,955	\$1,454	\$98	\$404	\$35	\$35	\$2,868	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$860,342
2027	\$294,168	\$41,879	\$194,998	\$1,481,955	\$1,420	\$95	\$392	\$34	\$34	\$2,854	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$915,752
2028	\$294,564	\$41,893	\$195,248	\$1,481,955	\$1,362	\$93	\$384	\$33	\$33	\$2,843	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$960,342
2029	\$294,884	\$41,929	\$195,460	\$1,481,955	\$1,310	\$89	\$377	\$33	\$33	\$2,831	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,010,854
2030	\$586,806	\$41,913	\$1,989,638	\$1,095,982	\$1,294	\$88	\$370	\$32	\$32	\$2,825	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,720,636
2031	\$299,010	\$42,546	\$1,989,185	\$82,809	\$1,284	\$88	\$367	\$32	\$32	\$2,819	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$635,363
2032	\$302,886	\$43,192	\$2,007,764	\$82,809	\$1,279	\$88	\$364	\$32	\$32	\$2,814	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$842,176
2033	\$306,901	\$43,852	\$2,034,425	\$81,777	\$1,263	\$87	\$361	\$32	\$32	\$2,808	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$947,923
2034	\$310,339	\$44,463	\$2,057,704	\$81,202	\$1,248	\$86	\$357	\$31	\$31	\$2,802	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,013,378
2035	\$313,198	\$45,088	\$2,089,543	\$80,536	\$1,233	\$85	\$354	\$31	\$31	\$2,796	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,082,928
2036	\$316,136	\$45,698	\$2,121,535	\$79,876	\$1,217	\$84	\$351	\$31	\$31	\$2,790	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,154,360
2037	\$319,136	\$46,327	\$2,153,577	\$79,220	\$1,202	\$83	\$348	\$30	\$30	\$2,784	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,228,260
2038	\$322,217	\$46,969	\$2,185,669	\$78,570	\$1,187	\$83	\$345	\$30	\$30	\$2,778	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,303,420
2039	\$325,373	\$47,608	\$2,217,811	\$77,926	\$1,172	\$82	\$341	\$30	\$30	\$2,771	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,379,643
2040	\$328,605	\$48,253	\$2,250,005	\$77,281	\$1,157	\$81	\$338	\$29	\$29	\$2,765	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,457,009
2041	\$331,914	\$48,929	\$2,282,251	\$76,636	\$1,143	\$80	\$335	\$29	\$29	\$2,759	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,535,369
2042	\$335,302	\$49,605	\$2,314,548	\$76,000	\$1,128	\$80	\$332	\$29	\$29	\$2,753	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,614,728
2043	\$338,769	\$50,291	\$2,346,843	\$75,358	\$1,113	\$79	\$328	\$29	\$29	\$2,747	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,694,088
2044	\$342,315	\$51,000	\$2,379,138	\$74,719	\$1,098	\$78	\$325	\$28	\$28	\$2,741	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,774,447
2045	\$345,943	\$51,765	\$2,411,433	\$74,079	\$1,083	\$78	\$322	\$28	\$28	\$2,735	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,854,806
2046	\$349,651	\$52,541	\$2,443,728	\$73,438	\$1,068	\$77	\$319	\$28	\$28	\$2,729	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,935,165
2047	\$353,442	\$53,327	\$2,476,023	\$72,797	\$1,053	\$76	\$316	\$28	\$28	\$2,723	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,015,524
2048	\$357,317	\$54,114	\$2,508,318	\$72,156	\$1,038	\$75	\$313	\$27	\$27	\$2,717	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,095,883
2049	\$361,275	\$54,901	\$2,540,613	\$71,515	\$1,023	\$74	\$310	\$27	\$27	\$2,711	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,176,242
2050	\$365,317	\$55,688	\$2,572,908	\$70,874	\$1,008	\$74	\$309	\$27	\$27	\$2,705	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,256,601

Scenario 1

ANNETTA NORTH TOTAL COSTS

(All cost amounts shown are in Current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$12,660	\$0	\$0	\$16,147	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$28,807
2001	\$0	\$613	\$0	\$0	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$693
2002	\$0	\$712	\$0	\$0	\$90	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$803
2003	\$0	\$812	\$0	\$0	\$100	\$2,438	\$0	\$209	\$0	\$18,249	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$27,248
2004	\$0	\$911	\$0	\$0	\$109	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,020
2005	\$19,451	\$1,056	\$100,018	\$0	\$117	\$436	\$1,590	\$0	\$137	\$0	\$7,139	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$128,944
2006	\$8,294	\$1,172	\$2,337	\$385	\$124	\$11	\$39	\$0	\$3	\$0	\$288	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,653
2007	\$8,729	\$1,291	\$2,355	\$647	\$131	\$11	\$40	\$0	\$3	\$0	\$290	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$13,497
2008	\$9,649	\$1,413	\$2,370	\$838	\$138	\$11	\$41	\$0	\$4	\$0	\$291	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,285
2009	\$9,649	\$1,539	\$2,384	\$985	\$144	\$11	\$41	\$0	\$4	\$0	\$291	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$15,047
2010	\$10,156	\$1,670	\$2,400	\$1,101	\$150	\$11	\$42	\$0	\$4	\$0	\$294	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$15,825
2011	\$34,887	\$2,194	\$170,338	\$104,649	\$159	\$11	\$42	\$0	\$4	\$0	\$301	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$312,574
2012	\$11,459	\$2,362	\$7,595	\$3,210	\$162	\$11	\$43	\$0	\$4	\$0	\$308	\$81,015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$108,038
2013	\$12,259	\$2,537	\$8,126	\$3,565	\$168	\$12	\$45	\$0	\$4	\$0	\$316	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$34,728
2014	\$13,108	\$8,473	\$8,688	\$3,865	\$174	\$12	\$46	\$0	\$4	\$0	\$316	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$62,346
2015	\$17,688	\$3,118	\$11,711	\$4,865	\$179	\$12	\$47	\$0	\$4	\$0	\$322	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$40,314
2016	\$18,313	\$3,227	\$12,606	\$4,832	\$179	\$12	\$47	\$0	\$4	\$0	\$322	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$67,038
2017	\$19,018	\$3,279	\$13,115	\$5,681	\$179	\$12	\$47	\$0	\$4	\$0	\$324	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$173,038
2018	\$19,786	\$3,462	\$13,688	\$5,681	\$179	\$12	\$47	\$0	\$4	\$0	\$326	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$45,334
2019	\$20,621	\$3,589	\$13,688	\$5,681	\$180	\$12	\$48	\$0	\$4	\$0	\$329	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$49,585
2020	\$22,914	\$3,806	\$15,168	\$5,681	\$180	\$12	\$48	\$0	\$4	\$0	\$333	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$53,632
2021	\$49,763	\$3,952	\$190,084	\$6,017	\$181	\$12	\$48	\$0	\$4	\$0	\$343	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$58,406
2022	\$25,079	\$4,107	\$16,623	\$6,017	\$181	\$12	\$48	\$0	\$4	\$0	\$350	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$72,327
2023	\$26,294	\$4,270	\$17,429	\$6,240	\$182	\$12	\$49	\$0	\$4	\$0	\$358	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$80,166
2024	\$27,607	\$4,442	\$18,299	\$6,240	\$182	\$12	\$49	\$0	\$4	\$0	\$366	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$82,925
2025	\$32,776	\$4,845	\$21,725	\$152,084	\$183	\$12	\$49	\$0	\$4	\$0	\$377	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$82,044
2026	\$34,585	\$5,052	\$22,924	\$7,929	\$184	\$12	\$50	\$0	\$4	\$0	\$400	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$92,028
2027	\$36,539	\$5,271	\$24,220	\$8,215	\$185	\$12	\$51	\$0	\$5	\$0	\$412	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$94,817
2028	\$38,651	\$5,502	\$25,619	\$8,536	\$187	\$12	\$51	\$0	\$5	\$0	\$423	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$99,921
2029	\$40,044	\$5,695	\$26,542	\$8,771	\$188	\$13	\$52	\$0	\$5	\$0	\$438	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$102,426
2030	\$41,478	\$5,914	\$27,493	\$9,014	\$189	\$13	\$53	\$0	\$5	\$0	\$446	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$102,633
2031	\$65,404	\$6,100	\$29,027	\$13,355	\$191	\$13	\$54	\$0	\$5	\$0	\$459	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$128,413
2032	\$44,184	\$6,287	\$29,287	\$13,355	\$191	\$13	\$54	\$0	\$5	\$0	\$471	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$110,463
2033	\$45,445	\$6,481	\$30,123	\$10,654	\$192	\$13	\$55	\$0	\$5	\$0	\$478	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$113,328
2034	\$46,761	\$6,681	\$30,985	\$10,957	\$193	\$13	\$55	\$0	\$5	\$0	\$485	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$116,291
2035	\$48,021	\$6,883	\$31,830	\$11,258	\$193	\$13	\$56	\$0	\$5	\$0	\$498	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$123,292
2036	\$49,224	\$7,096	\$32,627	\$11,553	\$194	\$13	\$56	\$0	\$5	\$0	\$512	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$126,484
2037	\$50,469	\$34,914	\$33,452	\$11,856	\$194	\$13	\$56	\$0	\$5	\$0	\$527	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$134,576
2038	\$51,757	\$7,513	\$34,307	\$12,166	\$195	\$14	\$56	\$0	\$5	\$0	\$540	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$136,752
2039	\$53,092	\$7,738	\$35,191	\$12,465	\$196	\$14	\$57	\$0	\$5	\$0	\$550	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$140,420
2040	\$54,473	\$7,970	\$36,107	\$12,813	\$196	\$14	\$58	\$0	\$5	\$0	\$565	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$148,993
2041	\$55,904	\$8,211	\$37,055	\$13,148	\$197	\$14	\$58	\$0	\$5	\$0	\$580	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$157,356
2042	\$57,386	\$8,459	\$38,037	\$13,465	\$198	\$14	\$58	\$0	\$5	\$0	\$595	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$166,993
2043	\$58,920	\$8,717	\$39,054	\$13,765	\$199	\$14	\$59	\$0	\$5	\$0	\$610	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$177,356
2044	\$60,509	\$8,963	\$40,108	\$14,058	\$199	\$14	\$59	\$0	\$5	\$0	\$625	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$188,993
2045	\$62,155	\$15,873	\$41,199	\$14,343	\$200	\$14	\$59	\$0	\$5	\$0	\$640	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$201,420
2046	\$63,860	\$9,543	\$42,329	\$15,465	\$200	\$14	\$60	\$0	\$5	\$0	\$655	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$215,752
2047	\$65,627	\$9,837	\$43,500	\$15,768	\$201	\$14	\$60	\$0	\$5	\$0	\$670	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$231,120
2048	\$87,456	\$10,142	\$44,713	\$16,080	\$201	\$14	\$60	\$0	\$5	\$0	\$685	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$247,593
2049	\$69,352	\$10,457	\$45,968	\$16,392	\$202	\$14	\$61	\$0	\$5	\$0	\$700	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$264,120
2050	\$71,316	\$10,784	\$47,271	\$16,735	\$202	\$15	\$61	\$0	\$5	\$0	\$715	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$281,756

Scenario 1

ANNETTA TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/Pumping	Storage/Treatment/Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$32,103	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$73,051
2000	\$0	\$1,565	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,758
2001	\$0	\$1,807	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,038
2002	\$0	\$2,058	\$11,534	\$0	\$253	\$2,261	\$0	\$10,374	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$26,480
2003	\$0	\$2,310	\$0	\$0	\$276	\$0	\$0	\$6,613	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,565
2004	\$49,326	\$2,677	\$253,631	\$0	\$297	\$1,106	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$313,650
2005	\$21,032	\$2,971	\$5,925	\$876	\$316	\$27	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$31,247
2006	\$22,116	\$3,273	\$5,971	\$1,640	\$333	\$27	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$33,381
2007	\$23,281	\$3,563	\$6,010	\$2,125	\$350	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$35,306
2008	\$24,469	\$3,902	\$6,044	\$2,497	\$365	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$37,306
2009	\$24,755	\$4,234	\$6,088	\$2,782	\$380	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$39,274
2010	\$25,058	\$4,564	\$6,132	\$3,068	\$394	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$41,247
2011	\$25,368	\$4,896	\$6,176	\$3,354	\$410	\$29	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$43,221
2012	\$25,680	\$5,228	\$6,219	\$3,641	\$425	\$29	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$45,195
2013	\$26,000	\$5,564	\$6,262	\$3,928	\$440	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$47,169
2014	\$26,323	\$5,900	\$6,305	\$4,214	\$455	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$49,143
2015	\$26,648	\$6,236	\$6,348	\$4,500	\$470	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$51,117
2016	\$26,973	\$6,572	\$6,391	\$4,786	\$485	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$53,091
2017	\$27,298	\$6,907	\$6,434	\$5,071	\$500	\$32	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$55,065
2018	\$27,623	\$7,242	\$6,477	\$5,356	\$515	\$32	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$57,039
2019	\$27,948	\$7,577	\$6,519	\$5,641	\$530	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$59,013
2020	\$28,273	\$7,912	\$6,562	\$5,926	\$545	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$60,987
2021	\$28,598	\$8,247	\$6,605	\$6,211	\$560	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$62,961
2022	\$28,923	\$8,582	\$6,648	\$6,496	\$575	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$64,935
2023	\$29,248	\$8,917	\$6,691	\$6,781	\$590	\$35	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$66,909
2024	\$29,573	\$9,252	\$6,734	\$7,066	\$605	\$35	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$68,883
2025	\$29,898	\$9,587	\$6,777	\$7,351	\$620	\$36	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$70,857
2026	\$30,223	\$9,922	\$6,820	\$7,636	\$635	\$36	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$72,831
2027	\$30,548	\$10,257	\$6,863	\$7,921	\$650	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$74,805
2028	\$30,873	\$10,592	\$6,906	\$8,206	\$665	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76,779
2029	\$31,198	\$10,927	\$6,949	\$8,491	\$680	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$78,753
2030	\$31,523	\$11,262	\$6,992	\$8,776	\$695	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$80,727
2031	\$31,848	\$11,597	\$7,035	\$9,061	\$710	\$39	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$82,701
2032	\$32,173	\$11,932	\$7,078	\$9,346	\$725	\$39	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$84,675
2033	\$32,498	\$12,267	\$7,121	\$9,631	\$740	\$40	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$86,649
2034	\$32,823	\$12,602	\$7,164	\$9,916	\$755	\$40	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$88,623
2035	\$33,148	\$12,937	\$7,207	\$10,201	\$770	\$41	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,597
2036	\$33,473	\$13,272	\$7,250	\$10,486	\$785	\$41	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$92,571
2037	\$33,798	\$13,607	\$7,293	\$10,771	\$800	\$42	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$94,545
2038	\$34,123	\$13,942	\$7,336	\$11,056	\$815	\$42	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$96,519
2039	\$34,448	\$14,277	\$7,379	\$11,341	\$830	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$98,493
2040	\$34,773	\$14,612	\$7,422	\$11,626	\$845	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$100,467
2041	\$35,098	\$14,947	\$7,465	\$11,911	\$860	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$102,441
2042	\$35,423	\$15,282	\$7,508	\$12,196	\$875	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$104,415
2043	\$35,748	\$15,617	\$7,551	\$12,481	\$890	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$106,389
2044	\$36,073	\$15,952	\$7,594	\$12,766	\$905	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$108,363
2045	\$36,398	\$16,287	\$7,637	\$13,051	\$920	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$110,337
2046	\$36,723	\$16,622	\$7,680	\$13,336	\$935	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$112,311
2047	\$37,048	\$16,957	\$7,723	\$13,621	\$950	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$114,285
2048	\$37,373	\$17,292	\$7,766	\$13,906	\$965	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$116,259
2049	\$37,698	\$17,627	\$7,809	\$14,191	\$980	\$48	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$118,233
2050	\$38,023	\$17,962	\$7,852	\$14,476	\$995	\$48	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$120,207

Scenario 1

ANNETTA SOUTH TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Treatment/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$20,208	\$0	\$25,775	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$45,983
2001	\$0	\$979	\$0	\$128	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,107
2002	\$0	\$1,137	\$0	\$144	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,282
2003	\$0	\$1,295	\$7,260	\$160	\$1,423	\$0	\$0	\$6,530	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16,668
2004	\$0	\$1,454	\$0	\$174	\$0	\$0	\$0	\$4,163	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$19,743
2005	\$31,049	\$1,665	\$159,852	\$0	\$696	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$19,669
2006	\$13,239	\$1,870	\$3,730	\$614	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$21,012
2007	\$13,934	\$2,060	\$3,758	\$1,033	\$210	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$22,268
2008	\$14,654	\$2,255	\$3,783	\$1,338	\$220	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$23,463
2009	\$15,403	\$2,456	\$3,805	\$1,572	\$230	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$24,722
2010	\$16,212	\$2,665	\$3,831	\$1,757	\$239	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$26,083
2011	\$55,688	\$3,502	\$271,898	\$167,043	\$248	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$496,396
2012	\$18,291	\$3,771	\$12,124	\$5,124	\$258	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$39,586
2013	\$19,568	\$4,049	\$12,971	\$5,681	\$268	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,100	\$0	\$21,798	\$109,890	\$0	\$0	\$0	\$0	\$180,353
2014	\$28,923	\$13,524	\$13,888	\$6,239	\$277	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,661	\$0	\$12,798	\$54,945	\$0	\$0	\$0	\$0	\$132,587
2015	\$28,202	\$4,978	\$18,693	\$7,666	\$286	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$87	\$0	\$299	\$1,665	\$0	\$0	\$0	\$0	\$63,845
2016	\$29,232	\$5,150	\$19,376	\$7,731	\$286	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$85	\$0	\$277	\$1,665	\$0	\$0	\$0	\$0	\$106,490
2017	\$30,357	\$5,956	\$20,935	\$10,057	\$286	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$83	\$0	\$277	\$1,665	\$0	\$0	\$0	\$0	\$127,430
2018	\$31,563	\$5,525	\$20,935	\$10,057	\$286	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$81	\$0	\$268	\$1,665	\$0	\$0	\$0	\$0	\$171,819
2019	\$32,916	\$5,729	\$21,816	\$9,037	\$286	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$79	\$0	\$260	\$1,665	\$0	\$0	\$0	\$0	\$178,591
2020	\$36,576	\$6,075	\$24,244	\$9,387	\$287	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$78	\$0	\$253	\$1,665	\$0	\$0	\$0	\$0	\$400,940
2021	\$79,433	\$6,309	\$305,417	\$9,479	\$287	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$77	\$0	\$242	\$1,665	\$0	\$0	\$0	\$0	\$86,024
2022	\$40,032	\$6,555	\$28,535	\$9,605	\$288	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76	\$0	\$242	\$1,665	\$0	\$0	\$0	\$0	\$86,665
2023	\$41,972	\$6,815	\$27,821	\$9,766	\$289	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$75	\$0	\$237	\$1,665	\$0	\$0	\$0	\$0	\$92,613
2024	\$44,067	\$7,090	\$29,209	\$9,860	\$291	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$74	\$0	\$234	\$1,665	\$0	\$0	\$0	\$0	\$338,772
2025	\$52,318	\$7,734	\$34,678	\$24,760	\$292	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$74	\$0	\$235	\$1,665	\$0	\$0	\$0	\$0	\$114,807
2026	\$55,206	\$8,065	\$36,593	\$12,657	\$294	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$74	\$0	\$237	\$1,665	\$0	\$0	\$0	\$0	\$128,545
2027	\$58,325	\$8,414	\$38,660	\$13,115	\$296	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$75	\$0	\$237	\$1,665	\$0	\$0	\$0	\$0	\$127,293
2028	\$61,696	\$8,783	\$40,894	\$13,626	\$298	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$75	\$0	\$238	\$1,665	\$0	\$0	\$0	\$0	\$131,675
2029	\$63,919	\$9,081	\$42,368	\$14,000	\$300	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$75	\$0	\$239	\$1,665	\$0	\$0	\$0	\$0	\$146,213
2030	\$66,209	\$9,428	\$43,865	\$14,388	\$302	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$75	\$0	\$241	\$1,665	\$0	\$0	\$0	\$0	\$922,585
2031	\$136,324	\$9,737	\$64,546	\$209,572	\$304	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76	\$0	\$241	\$1,665	\$0	\$0	\$0	\$0	\$146,161
2032	\$70,527	\$10,035	\$46,748	\$16,543	\$305	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76	\$0	\$242	\$1,665	\$0	\$0	\$0	\$0	\$150,264
2033	\$72,541	\$10,345	\$48,083	\$17,006	\$306	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76	\$0	\$242	\$1,665	\$0	\$0	\$0	\$0	\$154,582
2034	\$74,641	\$10,665	\$49,475	\$17,490	\$307	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76	\$0	\$243	\$1,665	\$0	\$0	\$0	\$0	\$158,731
2035	\$76,653	\$10,987	\$50,808	\$17,970	\$308	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76	\$0	\$243	\$1,665	\$0	\$0	\$0	\$0	\$162,720
2036	\$78,572	\$11,311	\$52,081	\$18,441	\$309	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76	\$0	\$244	\$1,665	\$0	\$0	\$0	\$0	\$210,929
2037	\$80,559	\$55,731	\$53,398	\$18,924	\$310	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76	\$0	\$244	\$1,665	\$0	\$0	\$0	\$0	\$171,110
2038	\$82,616	\$11,983	\$54,761	\$19,420	\$311	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76	\$0	\$245	\$1,665	\$0	\$0	\$0	\$0	\$175,521
2039	\$84,746	\$12,352	\$56,173	\$19,929	\$312	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$77	\$0	\$246	\$1,665	\$0	\$0	\$0	\$0	\$180,083
2040	\$86,952	\$12,723	\$57,635	\$20,452	\$313	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$77	\$0	\$246	\$1,665	\$0	\$0	\$0	\$0	\$189,707
2041	\$89,235	\$13,106	\$59,148	\$20,988	\$314	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$77	\$0	\$247	\$1,665	\$0	\$0	\$0	\$0	\$415,009
2042	\$91,600	\$13,503	\$60,716	\$21,536	\$315	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$77	\$0	\$247	\$1,665	\$0	\$0	\$0	\$0	\$185,957
2043	\$94,050	\$13,914	\$62,340	\$22,326	\$316	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$77	\$0	\$248	\$1,665	\$0	\$0	\$0	\$0	\$201,041
2044	\$96,568	\$14,338	\$64,021	\$23,765	\$317	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$77	\$0	\$249	\$1,665	\$0	\$0	\$0	\$0	\$216,864
2045	\$99,214	\$25,337	\$65,783	\$24,219	\$318	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$77	\$0	\$249	\$1,665	\$0	\$0	\$0	\$0	\$213,996
2046	\$101,938	\$15,232	\$67,567	\$24,886	\$319	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$77	\$0	\$251	\$1,665	\$0	\$0	\$0	\$0	\$217,388
2047	\$104,755	\$15,703	\$69,435	\$25,169	\$321	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$78	\$0	\$251	\$1,665	\$0	\$0	\$0	\$0	\$223,242
2048	\$107,676	\$16,189	\$71,372	\$25,667	\$322	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$78	\$0	\$251	\$1,665	\$0	\$0	\$0	\$0	\$223,242
2049	\$110,702	\$16,693	\$73,377	\$26,189	\$323	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$78	\$0	\$252	\$1,665	\$0	\$0	\$0	\$0	\$283,030
2050	\$113,837	\$17,213	\$75,455	\$26,713	\$46,940	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$78	\$0	\$252	\$1,665	\$0	\$0	\$0	\$0	\$282,176

Scenario 1

FORT WORTH NORTH ETJ TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Treatment Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	\$0	\$130	\$0	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$147
2002	\$0	\$256	\$0	\$32	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$288
2003	\$0	\$378	\$2,117	\$47	\$415	\$1,135	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,082
2004	\$0	\$486	\$0	\$59	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$558
2005	\$11,784	\$639	\$60,591	\$71	\$264	\$963	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$74,313
2006	\$5,414	\$765	\$1,525	\$81	\$7	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,818
2007	\$6,019	\$890	\$1,624	\$91	\$7	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,658
2008	\$6,596	\$1,015	\$1,703	\$99	\$8	\$29	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,449
2009	\$7,151	\$1,141	\$1,767	\$107	\$8	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,204
2010	\$7,708	\$1,267	\$1,821	\$114	\$8	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,950
2011	\$8,265	\$1,393	\$1,876	\$120	\$9	\$32	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$11,706
2012	\$8,822	\$1,519	\$1,931	\$127	\$9	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,462
2013	\$9,379	\$1,645	\$1,986	\$133	\$9	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$13,218
2014	\$10,044	\$1,771	\$2,041	\$138	\$9	\$35	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$13,974
2015	\$10,709	\$1,897	\$2,096	\$144	\$9	\$36	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,730
2016	\$11,374	\$2,023	\$2,151	\$149	\$9	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$15,486
2017	\$12,039	\$2,149	\$2,206	\$154	\$10	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16,242
2018	\$12,704	\$2,275	\$2,261	\$159	\$10	\$39	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,000
2019	\$13,369	\$2,401	\$2,316	\$164	\$10	\$40	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,758
2020	\$14,034	\$2,527	\$2,371	\$169	\$11	\$41	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,516
2021	\$14,700	\$2,653	\$2,426	\$174	\$11	\$42	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$19,274
2022	\$15,365	\$2,779	\$2,481	\$179	\$11	\$43	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20,032
2023	\$16,030	\$2,905	\$2,536	\$184	\$11	\$44	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20,790
2024	\$16,695	\$3,031	\$2,591	\$189	\$11	\$45	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$21,548
2025	\$17,360	\$3,157	\$2,646	\$194	\$11	\$46	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$22,306
2026	\$18,025	\$3,283	\$2,701	\$199	\$11	\$47	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$23,064
2027	\$18,690	\$3,409	\$2,756	\$204	\$11	\$48	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$23,822
2028	\$19,355	\$3,535	\$2,811	\$209	\$11	\$49	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$24,580
2029	\$20,020	\$3,661	\$2,866	\$214	\$11	\$50	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$25,338
2030	\$20,685	\$3,787	\$2,921	\$219	\$11	\$51	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$26,096
2031	\$21,350	\$3,913	\$2,976	\$224	\$11	\$52	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$26,854
2032	\$22,015	\$4,039	\$3,031	\$229	\$11	\$53	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$27,612
2033	\$22,680	\$4,165	\$3,086	\$234	\$11	\$54	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$28,370
2034	\$23,345	\$4,291	\$3,141	\$239	\$11	\$55	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$29,128
2035	\$24,010	\$4,417	\$3,196	\$244	\$11	\$56	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$29,886
2036	\$24,675	\$4,543	\$3,251	\$249	\$11	\$57	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$30,644
2037	\$25,340	\$4,669	\$3,306	\$254	\$11	\$58	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$31,402
2038	\$26,005	\$4,795	\$3,361	\$259	\$11	\$59	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,160
2039	\$26,670	\$4,921	\$3,416	\$264	\$11	\$60	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,918
2040	\$27,335	\$5,047	\$3,471	\$269	\$11	\$61	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$33,676
2041	\$28,000	\$5,173	\$3,526	\$274	\$11	\$62	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$34,434
2042	\$28,665	\$5,300	\$3,581	\$279	\$11	\$63	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$35,192
2043	\$29,330	\$5,426	\$3,636	\$284	\$11	\$64	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$35,950
2044	\$30,000	\$5,552	\$3,691	\$289	\$11	\$65	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$36,708
2045	\$30,665	\$5,678	\$3,746	\$294	\$11	\$66	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$37,466
2046	\$31,330	\$5,804	\$3,801	\$299	\$11	\$67	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$38,224
2047	\$32,000	\$5,930	\$3,856	\$304	\$11	\$68	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$38,982
2048	\$32,665	\$6,056	\$3,911	\$309	\$11	\$69	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$39,740
2049	\$33,330	\$6,182	\$3,966	\$314	\$11	\$70	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$40,498
2050	\$34,000	\$6,308	\$4,021	\$319	\$11	\$71	\$43,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$41,256

Scenario 1

FORT WORTH SOUTH ETJ TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	\$0	\$57	\$0	\$7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$112	\$0	\$14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$64
2003	\$0	\$165	\$924	\$20	\$181	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$631	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$126
2004	\$0	\$217	\$0	\$28	\$115	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$689	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,121
2005	\$5,141	\$279	\$26,435	\$31	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,690
2006	\$2,362	\$334	\$665	\$30	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,400
2007	\$2,626	\$388	\$708	\$40	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,765
2008	\$2,877	\$443	\$743	\$43	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,110
2009	\$3,120	\$498	\$771	\$47	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,438
2010	\$3,363	\$553	\$795	\$49	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,763
2011	\$1,762	\$740	\$57,427	\$52	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$19,660
2012	\$1,916	\$807	\$2,596	\$55	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,981
2013	\$4,232	\$876	\$2,865	\$58	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,731
2014	\$4,597	\$2,945	\$3,020	\$60	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$11,516
2015	\$6,170	\$1,089	\$4,090	\$63	\$275	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16,574
2016	\$6,632	\$1,169	\$4,396	\$67	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$13,847
2017	\$7,114	\$1,070	\$4,716	\$69	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$24,448
2018	\$7,619	\$1,333	\$5,050	\$71	\$55	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$24,179
2019	\$8,149	\$1,418	\$5,401	\$73	\$55	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,535
2020	\$8,267	\$1,562	\$5,748	\$73	\$55	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$38,400
2021	\$9,673	\$1,587	\$6,425	\$70	\$55	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$100,287
2022	\$9,693	\$1,613	\$6,585	\$69	\$55	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,535
2023	\$9,934	\$1,640	\$6,759	\$68	\$55	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$38,400
2024	\$10,196	\$1,749	\$7,844	\$66	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,032
2025	\$11,834	\$1,783	\$8,091	\$65	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,032
2026	\$12,207	\$1,819	\$8,357	\$65	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$21,880
2027	\$12,608	\$1,858	\$8,642	\$64	\$344	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$22,282
2028	\$13,038	\$1,896	\$8,923	\$63	\$344	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$26,265
2029	\$13,204	\$1,878	\$8,752	\$63	\$344	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$27,780
2030	\$13,371	\$1,923	\$8,963	\$62	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$28,079
2031	\$26,913	\$1,922	\$9,171	\$61	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$30,402
2032	\$13,789	\$1,962	\$9,140	\$60	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$168,444
2033	\$14,045	\$2,003	\$9,310	\$59	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$29,443
2034	\$14,311	\$2,045	\$9,486	\$59	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$29,921
2035	\$14,551	\$2,086	\$9,645	\$59	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$30,417
2036	\$14,767	\$2,128	\$9,788	\$58	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$30,868
2037	\$14,968	\$2,169	\$9,935	\$58	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$31,273
2038	\$15,215	\$2,209	\$10,085	\$57	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$31,689
2039	\$15,448	\$2,252	\$10,240	\$57	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,113
2040	\$15,687	\$2,295	\$10,398	\$56	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,548
2041	\$15,932	\$2,340	\$10,560	\$56	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,995
2042	\$16,183	\$2,386	\$10,727	\$55	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$34,328
2043	\$16,440	\$2,432	\$10,897	\$55	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$34,775
2044	\$16,704	\$2,480	\$11,072	\$55	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$34,708
2045	\$16,975	\$2,535	\$11,251	\$54	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$35,221
2046	\$17,252	\$2,578	\$11,435	\$54	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$35,753
2047	\$17,536	\$2,629	\$11,623	\$54	\$373	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$36,654
2048	\$17,827	\$2,680	\$11,816	\$54	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$36,837
2049	\$18,125	\$2,733	\$12,014	\$53	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$37,403
2050	\$18,431	\$2,787	\$12,217	\$53	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$48,124

UNINCORPORATED PARKER COUNTY ON NON-MUNICIPAL WATER SYSTEMS TOTAL COSTS

Scenario 1

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake	Raw Water Pumping	Treatment	Storage/Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2006	\$3,346	\$473	\$943	\$0	\$50	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,816
2007	\$6,429	\$950	\$1,734	\$0	\$97	\$8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,216
2008	\$9,322	\$1,435	\$2,406	\$0	\$140	\$11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$13,314
2009	\$12,078	\$1,926	\$2,983	\$0	\$180	\$14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,182
2010	\$14,767	\$2,428	\$3,488	\$0	\$218	\$16	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20,917
2011	\$58,814	\$5,573	\$277,398	\$0	\$253	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$338,435
2012	\$20,400	\$4,205	\$13,522	\$0	\$288	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$38,627
2013	\$23,452	\$4,653	\$15,545	\$0	\$321	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$41,813
2014	\$26,605	\$7,197	\$17,635	\$0	\$352	\$24	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$50,500
2015	\$37,682	\$6,651	\$24,977	\$0	\$382	\$24	\$1,681	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$80,587
2016	\$42,129	\$7,423	\$27,924	\$2,115	\$412	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$83,966
2017	\$48,903	\$7,853	\$31,023	\$4,138	\$441	\$29	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$93,868
2018	\$51,732	\$9,050	\$34,290	\$165,589	\$468	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$153,868
2019	\$56,944	\$9,911	\$37,744	\$0	\$495	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$189,864
2020	\$66,483	\$11,044	\$44,074	\$14,848	\$521	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$208,864
2021	\$79,359	\$12,995	\$52,882	\$16,310	\$572	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$240,134
2022	\$86,423	\$14,033	\$57,285	\$18,580	\$596	\$39	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$274,502
2023	\$93,964	\$15,117	\$62,283	\$20,902	\$619	\$41	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$306,386
2024	\$103,209	\$17,030	\$76,365	\$54,985	\$643	\$42	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$340,130
2025	\$126,782	\$17,844	\$80,059	\$28,749	\$643	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$376,863
2026	\$133,239	\$18,290	\$84,035	\$29,582	\$643	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$411,130
2027	\$137,145	\$19,505	\$90,905	\$31,186	\$643	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$447,510
2028	\$141,138	\$41,415	\$93,552	\$31,844	\$644	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$483,970
2029	\$148,982	\$20,622	\$98,871	\$461,017	\$645	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520,214
2030	\$152,832	\$21,199	\$98,751	\$461,017	\$645	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$556,458
2031	\$156,638	\$22,410	\$103,583	\$39,910	\$645	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$592,702
2032	\$160,531	\$23,025	\$106,472	\$39,498	\$646	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$628,946
2033	\$164,204	\$23,639	\$108,840	\$39,251	\$646	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$665,190
2034	\$171,891	\$116,147	\$111,285	\$40,019	\$647	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$701,434
2035	\$175,625	\$25,597	\$116,411	\$41,600	\$647	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$737,678
2036	\$179,680	\$26,290	\$119,098	\$42,414	\$647	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$773,922
2037	\$183,865	\$27,005	\$121,873	\$43,245	\$648	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$810,166
2038	\$188,186	\$27,741	\$124,736	\$44,074	\$648	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$846,410
2039	\$192,645	\$28,500	\$127,693	\$44,904	\$648	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$882,654
2040	\$197,246	\$29,282	\$130,744	\$45,734	\$648	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$918,898
2041	\$202,002	\$31,967	\$133,884	\$46,564	\$648	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$955,142
2042	\$206,938	\$30,919	\$137,147	\$47,394	\$649	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$991,386
2043	\$211,974	\$31,775	\$140,504	\$50,108	\$649	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,027,630
2044	\$217,203	\$32,657	\$143,970	\$51,778	\$649	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,063,874
2045	\$222,601	\$33,566	\$147,548	\$180,810	\$649	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,100,118
2046	\$228,174	\$34,502	\$151,242	\$53,543	\$84,086	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,136,362
2047	\$233,831	\$35,473	\$154,970	\$55,271	\$84,086	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,172,606
2048	\$239,574	\$36,486	\$158,744	\$57,044	\$84,086	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,208,850
2049	\$245,397	\$37,541	\$162,567	\$58,867	\$84,086	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,245,094
2050	\$251,298	\$38,638	\$166,440	\$60,739	\$84,086	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,281,338

Scenario 1

WEATHERFORD PORTION TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Treatment/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$2,071,922	\$0	\$0	\$2,642,744	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	\$0	\$84,715	\$0	\$0	\$11,089	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$85,460	\$0	\$0	\$10,850	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$86,276	\$0	\$0	\$10,625	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2004	\$0	\$87,159	\$0	\$0	\$10,411	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$0	\$92,068	\$0	\$0	\$10,207	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2006	\$0	\$94,054	\$0	\$0	\$9,990	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2007	\$0	\$96,158	\$0	\$0	\$9,787	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2008	\$0	\$98,377	\$0	\$0	\$9,597	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2009	\$0	\$100,712	\$0	\$0	\$9,419	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2010	\$0	\$103,230	\$0	\$0	\$9,258	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2011	\$0	\$128,689	\$0	\$0	\$9,112	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2012	\$0	\$131,965	\$0	\$0	\$9,028	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2013	\$0	\$135,437	\$0	\$0	\$8,951	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$433,572	\$0	\$0	\$8,881	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	\$0	\$153,371	\$0	\$0	\$8,816	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2016	\$0	\$158,117	\$0	\$0	\$8,778	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2017	\$0	\$1,405,845	\$0	\$0	\$8,745	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2018	\$0	\$168,423	\$0	\$0	\$8,717	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	\$0	\$174,005	\$0	\$0	\$8,694	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2020	\$0	\$183,858	\$0	\$0	\$8,676	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2021	\$0	\$190,241	\$0	\$0	\$8,666	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2022	\$0	\$196,965	\$0	\$0	\$8,664	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2023	\$0	\$204,048	\$0	\$0	\$8,664	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2024	\$0	\$211,508	\$0	\$0	\$8,667	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2025	\$0	\$229,887	\$0	\$0	\$8,674	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2026	\$0	\$238,880	\$0	\$0	\$8,699	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2027	\$0	\$248,340	\$0	\$0	\$8,726	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2028	\$0	\$258,305	\$0	\$0	\$8,757	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2029	\$0	\$266,388	\$0	\$0	\$8,790	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2030	\$0	\$587,273	\$0	\$0	\$8,824	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2031	\$0	\$283,295	\$0	\$0	\$8,857	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2032	\$0	\$291,560	\$0	\$0	\$8,871	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2033	\$0	\$300,110	\$0	\$0	\$8,885	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2034	\$0	\$308,958	\$0	\$0	\$8,900	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2035	\$0	\$317,823	\$0	\$0	\$8,915	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2036	\$0	\$326,707	\$0	\$0	\$8,931	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2037	\$0	\$1,607,254	\$0	\$0	\$8,947	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2038	\$0	\$345,345	\$0	\$0	\$8,962	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2039	\$0	\$355,119	\$0	\$0	\$8,978	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2040	\$0	\$365,209	\$0	\$0	\$8,993	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2041	\$0	\$375,626	\$0	\$0	\$9,008	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2042	\$0	\$386,379	\$0	\$0	\$9,023	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2043	\$0	\$397,460	\$0	\$0	\$9,038	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2044	\$0	\$408,940	\$0	\$0	\$9,053	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2045	\$0	\$421,419	\$0	\$0	\$9,067	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2046	\$0	\$432,983	\$0	\$0	\$9,082	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2047	\$0	\$445,560	\$0	\$0	\$9,096	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2048	\$0	\$458,605	\$0	\$0	\$9,110	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2049	\$0	\$472,040	\$0	\$0	\$9,124	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2050	\$0	\$485,908	\$0	\$0	\$1,325,053	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Scenario 1

ANNUALIZED TOTAL COST (10 YEAR FINANCING PACKAGES)

(Includes Capital, Operation and Maintenance)
(All cost amounts shown are in current Dollars)

Year	A Willow Park	B Aleo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	J Study Area Total	J W'ford (excluding raw water)	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$1,064,327	\$576,213	\$1,034,731	\$100,121	\$243,723	\$156,375	\$97,309	\$42,990	\$0	\$3,315,789	\$1,005,844	\$4,321,633
2001	\$1,064,327	\$576,213	\$1,034,731	\$100,121	\$243,723	\$156,375	\$97,309	\$42,990	\$0	\$3,315,789	\$1,005,844	\$4,321,633
2002	\$1,064,327	\$576,213	\$1,034,731	\$100,121	\$243,723	\$156,375	\$97,309	\$42,990	\$0	\$3,315,789	\$1,005,844	\$4,321,633
2003	\$1,064,327	\$576,213	\$1,034,731	\$100,121	\$243,723	\$156,375	\$97,309	\$42,990	\$0	\$3,315,789	\$1,005,844	\$4,321,633
2004	\$1,064,327	\$576,213	\$1,034,731	\$100,121	\$243,723	\$156,375	\$97,309	\$42,990	\$0	\$3,315,789	\$1,005,844	\$4,321,633
2005	\$1,064,327	\$576,213	\$1,034,731	\$100,121	\$243,723	\$156,375	\$97,309	\$42,990	\$336,395	\$3,652,184	\$1,005,844	\$4,658,028
2006	\$1,064,327	\$576,213	\$1,034,731	\$100,121	\$243,723	\$156,375	\$97,309	\$42,990	\$336,395	\$3,652,184	\$1,005,844	\$4,658,028
2007	\$1,064,327	\$576,213	\$1,034,731	\$100,121	\$243,723	\$156,375	\$97,309	\$42,990	\$336,395	\$3,652,184	\$1,005,844	\$4,658,028
2008	\$1,064,327	\$576,213	\$1,034,731	\$100,121	\$243,723	\$156,375	\$97,309	\$42,990	\$336,395	\$3,652,184	\$1,005,844	\$4,658,028
2009	\$1,064,327	\$576,213	\$1,034,731	\$100,121	\$243,723	\$156,375	\$97,309	\$42,990	\$336,395	\$3,652,184	\$1,005,844	\$4,658,028
2010	\$1,386,552	\$674,437	\$1,405,720	\$165,583	\$414,799	\$264,257	\$180,858	\$79,872	\$336,395	\$4,908,473	\$485,881	\$5,394,354
2011	\$1,386,552	\$674,437	\$1,405,720	\$165,583	\$414,799	\$264,257	\$180,858	\$79,872	\$336,395	\$4,908,473	\$485,881	\$5,394,354
2012	\$1,386,552	\$674,437	\$1,405,720	\$165,583	\$414,799	\$264,257	\$180,858	\$79,872	\$336,395	\$4,908,473	\$485,881	\$5,394,354
2013	\$1,386,552	\$674,437	\$1,405,720	\$165,583	\$414,799	\$264,257	\$180,858	\$79,872	\$336,395	\$4,908,473	\$485,881	\$5,394,354
2014	\$1,386,552	\$674,437	\$1,405,720	\$165,583	\$414,799	\$264,257	\$180,858	\$79,872	\$336,395	\$4,908,473	\$485,881	\$5,394,354
2015	\$1,386,552	\$674,437	\$1,405,720	\$165,583	\$414,799	\$264,257	\$180,858	\$79,872	\$732,526	\$5,304,603	\$485,881	\$5,790,484
2016	\$1,386,552	\$674,437	\$1,405,720	\$165,583	\$414,799	\$264,257	\$180,858	\$79,872	\$732,526	\$5,304,603	\$485,881	\$5,790,484
2017	\$1,386,552	\$674,437	\$1,405,720	\$165,583	\$414,799	\$264,257	\$180,858	\$79,872	\$732,526	\$5,304,603	\$485,881	\$5,790,484
2018	\$1,386,552	\$674,437	\$1,405,720	\$165,583	\$414,799	\$264,257	\$180,858	\$79,872	\$732,526	\$5,304,603	\$485,881	\$5,790,484
2019	\$1,386,552	\$674,437	\$1,405,720	\$165,583	\$414,799	\$264,257	\$180,858	\$79,872	\$732,526	\$5,304,603	\$485,881	\$5,790,484
2020	\$1,784,908	\$762,967	\$1,603,201	\$214,604	\$537,717	\$338,865	\$188,665	\$82,416	\$732,526	\$6,245,868	\$635,051	\$6,880,919
2021	\$1,784,908	\$762,967	\$1,603,201	\$214,604	\$537,717	\$338,865	\$188,665	\$82,416	\$732,526	\$6,245,868	\$635,051	\$6,880,919
2022	\$1,784,908	\$762,967	\$1,603,201	\$214,604	\$537,717	\$338,865	\$188,665	\$82,416	\$732,526	\$6,245,868	\$635,051	\$6,880,919
2023	\$1,784,908	\$762,967	\$1,603,201	\$214,604	\$537,717	\$338,865	\$188,665	\$82,416	\$732,526	\$6,245,868	\$635,051	\$6,880,919
2024	\$1,784,908	\$762,967	\$1,603,201	\$214,604	\$537,717	\$338,865	\$188,665	\$82,416	\$732,526	\$6,245,868	\$635,051	\$6,880,919
2025	\$1,784,908	\$762,967	\$1,603,201	\$214,604	\$537,717	\$338,865	\$188,665	\$82,416	\$826,909	\$6,340,251	\$635,051	\$6,975,302
2026	\$1,784,908	\$762,967	\$1,603,201	\$214,604	\$537,717	\$338,865	\$188,665	\$82,416	\$826,909	\$6,340,251	\$635,051	\$6,975,302
2027	\$1,784,908	\$762,967	\$1,603,201	\$214,604	\$537,717	\$338,865	\$188,665	\$82,416	\$826,909	\$6,340,251	\$635,051	\$6,975,302
2028	\$1,784,908	\$762,967	\$1,603,201	\$214,604	\$537,717	\$338,865	\$188,665	\$82,416	\$826,909	\$6,340,251	\$635,051	\$6,975,302
2029	\$1,784,908	\$762,967	\$1,603,201	\$214,604	\$537,717	\$338,865	\$188,665	\$82,416	\$826,909	\$6,340,251	\$635,051	\$6,975,302
2030	\$2,132,282	\$768,490	\$1,571,688	\$256,646	\$642,742	\$404,981	\$180,803	\$78,049	\$826,909	\$6,862,590	\$830,611	\$7,693,201
2031	\$2,132,282	\$768,490	\$1,571,688	\$256,646	\$642,742	\$404,981	\$180,803	\$78,049	\$826,909	\$6,862,590	\$830,611	\$7,693,201
2032	\$2,132,282	\$768,490	\$1,571,688	\$256,646	\$642,742	\$404,981	\$180,803	\$78,049	\$826,909	\$6,862,590	\$830,611	\$7,693,201
2033	\$2,132,282	\$768,490	\$1,571,688	\$256,646	\$642,742	\$404,981	\$180,803	\$78,049	\$826,909	\$6,862,590	\$830,611	\$7,693,201
2034	\$2,132,282	\$768,490	\$1,571,688	\$256,646	\$642,742	\$404,981	\$180,803	\$78,049	\$826,909	\$6,862,590	\$830,611	\$7,693,201
2035	\$2,132,282	\$768,490	\$1,571,688	\$256,646	\$642,742	\$404,981	\$180,803	\$78,049	\$639,902	\$6,675,584	\$830,611	\$7,506,194
2036	\$2,132,282	\$768,490	\$1,571,688	\$256,646	\$642,742	\$404,981	\$180,803	\$78,049	\$639,902	\$6,675,584	\$830,611	\$7,506,194
2037	\$2,132,282	\$768,490	\$1,571,688	\$256,646	\$642,742	\$404,981	\$180,803	\$78,049	\$639,902	\$6,675,584	\$830,611	\$7,506,194
2038	\$2,132,282	\$768,490	\$1,571,688	\$256,646	\$642,742	\$404,981	\$180,803	\$78,049	\$639,902	\$6,675,584	\$830,611	\$7,506,194
2039	\$2,132,282	\$768,490	\$1,571,688	\$256,646	\$642,742	\$404,981	\$180,803	\$78,049	\$639,902	\$6,675,584	\$830,611	\$7,506,194
2040	\$1,204,684	\$389,401	\$788,070	\$144,239	\$363,702	\$229,160	\$95,400	\$41,118	\$639,902	\$3,895,675	\$678,424	\$4,574,099
2041	\$1,204,684	\$389,401	\$788,070	\$144,239	\$363,702	\$229,160	\$95,400	\$41,118	\$639,902	\$3,895,675	\$678,424	\$4,574,099
2042	\$1,204,684	\$389,401	\$788,070	\$144,239	\$363,702	\$229,160	\$95,400	\$41,118	\$639,902	\$3,895,675	\$678,424	\$4,574,099
2043	\$1,204,684	\$389,401	\$788,070	\$144,239	\$363,702	\$229,160	\$95,400	\$41,118	\$639,902	\$3,895,675	\$678,424	\$4,574,099
2044	\$1,204,684	\$389,401	\$788,070	\$144,239	\$363,702	\$229,160	\$95,400	\$41,118	\$639,902	\$3,895,675	\$678,424	\$4,574,099
2045	\$1,204,684	\$389,401	\$788,070	\$144,239	\$363,702	\$229,160	\$95,400	\$41,118	\$259,811	\$3,515,584	\$678,424	\$4,194,008
2046	\$1,204,684	\$389,401	\$788,070	\$144,239	\$363,702	\$229,160	\$95,400	\$41,118	\$259,811	\$3,515,584	\$678,424	\$4,194,008
2047	\$1,204,684	\$389,401	\$788,070	\$144,239	\$363,702	\$229,160	\$95,400	\$41,118	\$259,811	\$3,515,584	\$678,424	\$4,194,008
2048	\$1,204,684	\$389,401	\$788,070	\$144,239	\$363,702	\$229,160	\$95,400	\$41,118	\$259,811	\$3,515,584	\$678,424	\$4,194,008
2049	\$1,204,684	\$389,401	\$788,070	\$144,239	\$363,702	\$229,160	\$95,400	\$41,118	\$259,811	\$3,515,584	\$678,424	\$4,194,008
2050	\$129,144	\$38,632	\$77,934	\$15,463	\$39,051	\$24,601	\$9,640	\$4,161	\$259,811	\$598,437	\$273,412	\$871,849

Scenario 1

ADDED MONTHLY RATE INCREASE BASED ON TOTAL COST

(Based on System Capital, Operation and Maintenance)

(All cost amounts shown are in current Dollars)

Year	A Willow Park	B Aledo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	J Study Area Total	W'ford (excluding raw water)	Total
1998	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		\$0.00	
1999	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		\$0.00	
2000	\$81.81	\$88.21	\$179.68	\$67.15	\$64.46	\$65.71	\$35.46	\$35.90	\$0.00		\$12.52	
2001	\$79.12	\$85.31	\$167.44	\$64.90	\$62.30	\$63.50	\$35.05	\$35.50	\$0.00		\$11.78	
2002	\$76.52	\$82.50	\$156.03	\$62.73	\$60.21	\$61.38	\$34.65	\$35.09	\$0.00		\$11.42	
2003	\$74.01	\$79.79	\$145.40	\$60.62	\$58.19	\$59.32	\$34.26	\$34.69	\$0.00		\$11.08	
2004	\$71.57	\$77.17	\$135.50	\$58.59	\$56.24	\$57.33	\$33.87	\$34.30	\$0.00		\$10.75	
2005	\$69.22	\$74.63	\$126.27	\$56.62	\$54.36	\$55.41	\$33.49	\$33.91	\$44.39		\$10.42	
2006	\$66.94	\$72.17	\$117.67	\$54.73	\$52.53	\$53.55	\$33.10	\$33.52	\$43.18		\$10.11	
2007	\$64.74	\$69.80	\$109.65	\$52.89	\$50.77	\$51.75	\$32.73	\$33.14	\$42.01		\$9.80	
2008	\$62.61	\$67.51	\$102.18	\$51.12	\$49.07	\$50.02	\$32.36	\$32.76	\$40.86		\$9.51	
2009	\$60.55	\$65.29	\$95.22	\$49.40	\$47.42	\$48.34	\$31.99	\$32.39	\$39.75		\$4.46	
2010	\$76.29	\$73.90	\$120.55	\$78.96	\$78.00	\$78.95	\$58.78	\$58.46	\$38.67		\$4.32	
2011	\$73.78	\$71.47	\$112.34	\$76.31	\$75.39	\$76.30	\$58.11	\$57.79	\$37.61		\$4.19	
2012	\$71.36	\$69.12	\$104.69	\$73.75	\$72.86	\$73.74	\$57.45	\$57.14	\$36.59		\$4.07	
2013	\$69.01	\$66.85	\$97.55	\$71.28	\$70.42	\$71.27	\$56.80	\$56.49	\$35.59		\$3.94	
2014	\$66.74	\$64.65	\$90.91	\$68.89	\$68.06	\$68.88	\$56.15	\$55.85	\$34.62		\$3.82	
2015	\$64.55	\$62.52	\$84.72	\$66.58	\$65.77	\$66.57	\$55.51	\$55.21	\$73.34		\$3.71	
2016	\$62.43	\$60.47	\$78.94	\$64.35	\$63.57	\$64.34	\$54.88	\$54.58	\$71.34		\$3.60	
2017	\$60.37	\$58.48	\$73.57	\$62.19	\$61.44	\$62.18	\$54.26	\$53.96	\$69.40		\$3.49	
2018	\$58.39	\$56.56	\$68.56	\$60.10	\$59.38	\$60.09	\$53.64	\$53.35	\$67.51		\$3.39	
2019	\$56.47	\$54.70	\$63.89	\$58.09	\$57.38	\$58.08	\$53.03	\$52.74	\$65.67		\$4.29	
2020	\$70.30	\$59.84	\$67.90	\$72.76	\$71.89	\$71.98	\$54.69	\$52.91	\$63.88		\$4.16	
2021	\$67.99	\$57.88	\$63.27	\$70.32	\$69.48	\$69.56	\$54.07	\$52.30	\$62.14		\$4.04	
2022	\$65.75	\$55.97	\$58.96	\$67.96	\$67.15	\$67.23	\$53.45	\$51.71	\$60.45		\$3.92	
2023	\$63.59	\$54.13	\$54.95	\$65.68	\$64.90	\$64.98	\$52.85	\$51.12	\$58.80		\$3.80	
2024	\$61.50	\$52.35	\$51.20	\$63.48	\$62.72	\$62.80	\$52.24	\$50.54	\$57.20		\$3.68	
2025	\$59.48	\$50.63	\$47.71	\$61.35	\$60.62	\$60.69	\$51.65	\$49.97	\$62.81		\$3.57	
2026	\$57.52	\$48.97	\$44.46	\$59.29	\$58.59	\$58.66	\$51.06	\$49.40	\$61.10		\$3.47	
2027	\$55.63	\$47.36	\$41.44	\$57.31	\$56.62	\$56.69	\$50.48	\$48.84	\$59.44		\$3.36	
2028	\$53.80	\$45.80	\$38.61	\$55.38	\$54.72	\$54.79	\$49.91	\$48.28	\$57.82		\$3.26	
2029	\$52.03	\$44.29	\$38.56	\$53.53	\$52.89	\$52.95	\$49.34	\$47.73	\$56.24		\$4.14	
2030	\$60.11	\$43.15	\$37.80	\$61.87	\$61.10	\$61.16	\$46.75	\$44.60	\$54.71		\$4.01	
2031	\$58.14	\$41.73	\$37.80	\$59.79	\$59.05	\$59.11	\$46.22	\$44.09	\$53.22		\$3.89	
2032	\$56.23	\$40.36	\$37.80	\$57.79	\$57.07	\$57.13	\$45.69	\$43.59	\$51.77		\$3.77	
2033	\$54.38	\$39.03	\$37.80	\$55.85	\$55.16	\$55.21	\$45.17	\$43.10	\$50.36		\$3.66	
2034	\$52.59	\$37.75	\$37.80	\$53.97	\$53.31	\$53.36	\$44.66	\$42.61	\$48.99		\$3.55	
2035	\$50.86	\$37.14	\$37.80	\$52.16	\$51.52	\$51.57	\$44.15	\$42.12	\$36.88		\$3.44	
2036	\$49.19	\$37.14	\$37.80	\$50.42	\$49.79	\$49.84	\$43.65	\$41.64	\$35.87		\$3.34	
2037	\$47.57	\$37.14	\$37.80	\$48.72	\$48.12	\$48.17	\$43.15	\$41.17	\$34.90		\$3.24	
2038	\$46.01	\$37.14	\$37.80	\$47.09	\$46.51	\$46.55	\$42.66	\$40.70	\$33.95		\$3.14	
2039	\$44.49	\$37.14	\$37.80	\$45.51	\$44.95	\$44.99	\$42.18	\$40.24	\$33.02		\$2.49	
2040	\$24.31	\$18.82	\$18.96	\$24.72	\$24.58	\$24.60	\$22.00	\$20.92	\$32.12		\$2.41	
2041	\$23.51	\$18.82	\$18.96	\$23.89	\$23.76	\$23.78	\$21.75	\$20.69	\$31.25		\$2.34	
2042	\$22.74	\$18.82	\$18.96	\$23.09	\$22.96	\$22.98	\$21.50	\$20.45	\$30.40		\$2.27	
2043	\$21.99	\$18.82	\$18.96	\$22.32	\$22.19	\$22.21	\$21.26	\$20.22	\$29.57		\$2.20	
2044	\$21.27	\$18.82	\$18.96	\$21.57	\$21.45	\$21.47	\$21.02	\$19.99	\$28.76		\$2.14	
2045	\$20.57	\$18.82	\$18.96	\$20.84	\$20.73	\$20.75	\$20.78	\$19.76	\$11.36		\$2.07	
2046	\$19.89	\$18.82	\$18.96	\$20.15	\$20.03	\$20.05	\$20.54	\$19.54	\$11.05		\$2.01	
2047	\$19.24	\$18.82	\$18.96	\$19.47	\$19.36	\$19.38	\$20.31	\$19.31	\$10.75		\$1.95	
2048	\$18.61	\$18.82	\$18.96	\$18.82	\$18.71	\$18.73	\$20.08	\$19.09	\$10.46		\$1.89	
2049	\$17.99	\$18.82	\$18.96	\$18.19	\$18.08	\$18.10	\$19.85	\$18.88	\$10.17		\$1.89	
2050	\$1.87	\$1.87	\$1.87	\$1.88	\$1.88	\$1.88	\$1.98	\$1.90	\$9.89		\$0.74	

Scenario 1

CAPITAL COST SUMMARY DATA

Total Annual Capital Cost
(All cost amounts shown are in current Dollars)

Year	A Willow Park	B Aledo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	Total	J Wford	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$438,384	\$251,414	\$349,572	\$28,224	\$71,573	\$45,052	\$0	\$0	\$0	\$1,184,219	\$1,987,879	\$3,172,098
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$107,906	\$101,407	\$392,400	\$26,337	\$24,169	\$15,213	\$3,668	\$1,936	\$0	\$673,035	\$0	\$673,035
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$3,272,386	\$2,030,777	\$2,733,571	\$118,245	\$284,815	\$179,281	\$67,401	\$29,685	\$0	\$8,716,160	\$0	\$8,716,160
2006	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2007	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2008	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2011	\$3,267,347	\$1,640,691	\$2,975,835	\$289,237	\$733,461	\$461,688	\$166,413	\$72,602	\$305,227	\$9,912,500	\$0	\$9,912,500
2012	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2013	\$0	\$0	\$0	\$81,015	\$186,076	\$137,788	\$0	\$1,319	\$33,434	\$439,631	\$0	\$439,631
2014	\$51,196	\$25,708	\$53,339	\$5,754	\$14,592	\$9,185	\$4,585	\$2,000	\$11,880	\$178,039	\$294,461	\$472,500
2015	\$6,655	\$3,342	\$123,741	\$43,189	\$93,162	\$70,576	\$621	\$1,052	\$23,110	\$365,448	\$0	\$365,448
2016	\$0	\$0	\$66,600	\$0	\$0	\$0	\$0	\$0	\$0	\$66,600	\$0	\$66,600
2017	\$217,955	\$108,959	\$230,787	\$25,450	\$64,537	\$40,624	\$21,822	\$9,520	\$62,631	\$782,286	\$1,242,714	\$2,025,000
2018	\$1,110,042	\$543,280	\$1,151,380	\$129,205	\$319,310	\$200,994	\$547,899	\$234,811	\$703,659	\$4,940,580	\$0	\$4,940,580
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$157,500	\$75,496	\$266,184	\$499,180	\$0	\$499,180
2021	\$1,708,314	\$826,699	\$1,770,912	\$200,015	\$507,207	\$319,268	\$181,249	\$79,074	\$607,262	\$6,200,000	\$0	\$6,200,000
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$295,020	\$295,020	\$0	\$295,020
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2025	\$1,234,910	\$620,107	\$1,407,155	\$144,407	\$366,195	\$230,507	\$135,590	\$59,155	\$670,013	\$4,868,040	\$0	\$4,868,040
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2027	\$8,387	\$18,085	\$7,737	\$986	\$12,300	\$7,743	\$780	\$1,674	\$16,830	\$74,520	\$0	\$74,520
2028	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2029	\$0	\$16,640	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16,640	\$0	\$16,640
2030	\$53,288	\$21,776	\$44,627	\$6,277	\$15,918	\$10,020	\$4,638	\$2,024	\$21,360	\$179,929	\$292,571	\$472,500
2031	\$3,620,046	\$1,516,097	\$3,098,067	\$426,244	\$1,080,891	\$680,382	\$319,668	\$139,463	\$1,456,642	\$12,337,500	\$0	\$12,337,500
2032	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2033	\$4,960	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,960	\$0	\$4,960
2034	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2035	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2036	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2037	\$233,906	\$86,108	\$172,995	\$27,618	\$70,035	\$44,084	\$18,800	\$8,202	\$91,875	\$753,623	\$1,271,377	\$2,025,000
2038	\$0	\$0	\$133,921	\$21,719	\$0	\$0	\$0	\$0	\$0	\$155,640	\$0	\$155,640
2039	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2040	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2041	\$0	\$0	\$0	\$0	\$7,792	\$4,905	\$0	\$876	\$10,107	\$23,680	\$0	\$23,680
2042	\$1,186,576	\$403,938	\$811,535	\$140,308	\$355,801	\$223,964	\$90,693	\$39,567	\$460,116	\$3,712,500	\$0	\$3,712,500
2043	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2044	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2045	\$55,891	\$18,134	\$36,432	\$6,615	\$16,775	\$10,559	\$4,141	\$1,807	\$21,499	\$171,851	\$300,649	\$472,500
2046	\$11,540	\$3,684	\$7,402	\$1,366	\$3,465	\$2,181	\$846	\$369	\$4,427	\$35,280	\$0	\$35,280
2047	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2048	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2049	\$377,820	\$102,399	\$230,691	\$44,775	\$101,256	\$63,737	\$26,822	\$10,436	\$128,163	\$1,086,100	\$0	\$1,086,100
2050	\$246,345	\$73,637	\$147,942	\$29,204	\$74,057	\$46,616	\$17,299	\$7,547	\$93,437	\$736,085	\$0	\$736,085

Scenario 1

ANNUALIZED CAPITAL COST (10 YEAR FINANCING PACKAGES)

(Includes Capital Expenditures Only)

(All cost amounts shown are in current Dollars)

Year	A Willow Park	B Aledo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	J Study Area Total	W'ford (excluding raw water)	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$738,616	\$410,254	\$704,209	\$65,097	\$156,208	\$101,169	\$70,829	\$30,770	\$0	\$2,277,152	\$307,330	\$2,584,483
2001	\$738,616	\$410,254	\$704,209	\$65,097	\$156,208	\$101,169	\$70,829	\$30,770	\$0	\$2,277,152	\$307,330	\$2,584,483
2002	\$738,616	\$410,254	\$704,209	\$65,097	\$156,208	\$101,169	\$70,829	\$30,770	\$0	\$2,277,152	\$307,330	\$2,584,483
2003	\$738,616	\$410,254	\$704,209	\$65,097	\$156,208	\$101,169	\$70,829	\$30,770	\$0	\$2,277,152	\$307,330	\$2,584,483
2004	\$738,616	\$410,254	\$704,209	\$65,097	\$156,208	\$101,169	\$70,829	\$30,770	\$0	\$2,277,152	\$307,330	\$2,584,483
2005	\$738,616	\$410,254	\$704,209	\$65,097	\$156,208	\$101,169	\$70,829	\$30,770	\$201,240	\$2,478,392	\$307,330	\$2,785,723
2006	\$738,616	\$410,254	\$704,209	\$65,097	\$156,208	\$101,169	\$70,829	\$30,770	\$201,240	\$2,478,392	\$307,330	\$2,785,723
2007	\$738,616	\$410,254	\$704,209	\$65,097	\$156,208	\$101,169	\$70,829	\$30,770	\$201,240	\$2,478,392	\$307,330	\$2,785,723
2008	\$738,616	\$410,254	\$704,209	\$65,097	\$156,208	\$101,169	\$70,829	\$30,770	\$201,240	\$2,478,392	\$307,330	\$2,785,723
2009	\$738,616	\$410,254	\$704,209	\$65,097	\$156,208	\$101,169	\$70,829	\$30,770	\$201,240	\$2,478,392	\$307,330	\$2,785,723
2010	\$663,022	\$331,607	\$678,949	\$80,145	\$200,249	\$128,891	#####	\$46,792	\$201,240	\$2,436,952	\$134,018	\$2,570,969
2011	\$663,022	\$331,607	\$678,949	\$80,145	\$200,249	\$128,891	#####	\$46,792	\$201,240	\$2,436,952	\$134,018	\$2,570,969
2012	\$663,022	\$331,607	\$678,949	\$80,145	\$200,249	\$128,891	#####	\$46,792	\$201,240	\$2,436,952	\$134,018	\$2,570,969
2013	\$663,022	\$331,607	\$678,949	\$80,145	\$200,249	\$128,891	#####	\$46,792	\$201,240	\$2,436,952	\$134,018	\$2,570,969
2014	\$663,022	\$331,607	\$678,949	\$80,145	\$200,249	\$128,891	#####	\$46,792	\$201,240	\$2,436,952	\$134,018	\$2,570,969
2015	\$663,022	\$331,607	\$678,949	\$80,145	\$200,249	\$128,891	#####	\$46,792	\$359,437	\$2,595,148	\$134,018	\$2,729,166
2016	\$663,022	\$331,607	\$678,949	\$80,145	\$200,249	\$128,891	#####	\$46,792	\$359,437	\$2,595,148	\$134,018	\$2,729,166
2017	\$663,022	\$331,607	\$678,949	\$80,145	\$200,249	\$128,891	#####	\$46,792	\$359,437	\$2,595,148	\$134,018	\$2,729,166
2018	\$663,022	\$331,607	\$678,949	\$80,145	\$200,249	\$128,891	#####	\$46,792	\$359,437	\$2,595,148	\$134,018	\$2,729,166
2019	\$663,022	\$331,607	\$678,949	\$80,145	\$200,249	\$128,891	#####	\$46,792	\$359,437	\$2,595,148	\$134,018	\$2,729,166
2020	\$598,418	\$270,753	\$578,506	\$72,125	\$178,950	\$112,643	\$71,337	\$31,830	\$359,437	\$2,273,998	\$136,352	\$2,410,350
2021	\$598,418	\$270,753	\$578,506	\$72,125	\$178,950	\$112,643	\$71,337	\$31,830	\$359,437	\$2,273,998	\$136,352	\$2,410,350
2022	\$598,418	\$270,753	\$578,506	\$72,125	\$178,950	\$112,643	\$71,337	\$31,830	\$359,437	\$2,273,998	\$136,352	\$2,410,350
2023	\$598,418	\$270,753	\$578,506	\$72,125	\$178,950	\$112,643	\$71,337	\$31,830	\$359,437	\$2,273,998	\$136,352	\$2,410,350
2024	\$598,418	\$270,753	\$578,506	\$72,125	\$178,950	\$112,643	\$71,337	\$31,830	\$359,437	\$2,273,998	\$136,352	\$2,410,350
2025	\$598,418	\$270,753	\$578,506	\$72,125	\$178,950	\$112,643	\$71,337	\$31,830	\$237,747	\$2,152,308	\$136,352	\$2,288,661
2026	\$598,418	\$270,753	\$578,506	\$72,125	\$178,950	\$112,643	\$71,337	\$31,830	\$237,747	\$2,152,308	\$136,352	\$2,288,661
2027	\$598,418	\$270,753	\$578,506	\$72,125	\$178,950	\$112,643	\$71,337	\$31,830	\$237,747	\$2,152,308	\$136,352	\$2,288,661
2028	\$598,418	\$270,753	\$578,506	\$72,125	\$178,950	\$112,643	\$71,337	\$31,830	\$237,747	\$2,152,308	\$136,352	\$2,288,661
2029	\$598,418	\$270,753	\$578,506	\$72,125	\$178,950	\$112,643	\$71,337	\$31,830	\$237,747	\$2,152,308	\$136,352	\$2,288,661
2030	\$483,354	\$187,633	\$395,440	\$58,843	\$144,023	\$90,657	\$40,594	\$17,676	\$237,747	\$1,655,967	\$162,564	\$1,818,532
2031	\$483,354	\$187,633	\$395,440	\$58,843	\$144,023	\$90,657	\$40,594	\$17,676	\$237,747	\$1,655,967	\$162,564	\$1,818,532
2032	\$483,354	\$187,633	\$395,440	\$58,843	\$144,023	\$90,657	\$40,594	\$17,676	\$237,747	\$1,655,967	\$162,564	\$1,818,532
2033	\$483,354	\$187,633	\$395,440	\$58,843	\$144,023	\$90,657	\$40,594	\$17,676	\$237,747	\$1,655,967	\$162,564	\$1,818,532
2034	\$483,354	\$187,633	\$395,440	\$58,843	\$144,023	\$90,657	\$40,594	\$17,676	\$70,587	\$1,488,807	\$162,564	\$1,651,371
2035	\$483,354	\$187,633	\$395,440	\$58,843	\$144,023	\$90,657	\$40,594	\$17,676	\$70,587	\$1,488,807	\$162,564	\$1,651,371
2036	\$483,354	\$187,633	\$395,440	\$58,843	\$144,023	\$90,657	\$40,594	\$17,676	\$70,587	\$1,488,807	\$162,564	\$1,651,371
2037	\$483,354	\$187,633	\$395,440	\$58,843	\$144,023	\$90,657	\$40,594	\$17,676	\$70,587	\$1,488,807	\$162,564	\$1,651,371
2038	\$483,354	\$187,633	\$395,440	\$58,843	\$144,023	\$90,657	\$40,594	\$17,676	\$70,587	\$1,488,807	\$162,564	\$1,651,371
2039	\$483,354	\$187,633	\$395,440	\$58,843	\$144,023	\$90,657	\$40,594	\$17,676	\$70,587	\$1,488,807	\$162,564	\$1,651,371
2040	\$163,748	\$52,467	\$107,586	\$19,378	\$48,749	\$30,686	\$12,189	\$5,284	\$70,587	\$510,672	\$26,212	\$536,884
2041	\$163,748	\$52,467	\$107,586	\$19,378	\$48,749	\$30,686	\$12,189	\$5,284	\$70,587	\$510,672	\$26,212	\$536,884
2042	\$163,748	\$52,467	\$107,586	\$19,378	\$48,749	\$30,686	\$12,189	\$5,284	\$70,587	\$510,672	\$26,212	\$536,884
2043	\$163,748	\$52,467	\$107,586	\$19,378	\$48,749	\$30,686	\$12,189	\$5,284	\$70,587	\$510,672	\$26,212	\$536,884
2044	\$163,748	\$52,467	\$107,586	\$19,378	\$48,749	\$30,686	\$12,189	\$5,284	\$70,587	\$510,672	\$26,212	\$536,884
2045	\$163,748	\$52,467	\$107,586	\$19,378	\$48,749	\$30,686	\$12,189	\$5,284	\$21,580	\$461,666	\$26,212	\$487,878
2046	\$163,748	\$52,467	\$107,586	\$19,378	\$48,749	\$30,686	\$12,189	\$5,284	\$21,580	\$461,666	\$26,212	\$487,878
2047	\$163,748	\$52,467	\$107,586	\$19,378	\$48,749	\$30,686	\$12,189	\$5,284	\$21,580	\$461,666	\$26,212	\$487,878
2048	\$163,748	\$52,467	\$107,586	\$19,378	\$48,749	\$30,686	\$12,189	\$5,284	\$21,580	\$461,666	\$26,212	\$487,878
2049	\$163,748	\$52,467	\$107,586	\$19,378	\$48,749	\$30,686	\$12,189	\$5,284	\$21,580	\$461,666	\$26,212	\$487,878
2050	\$21,477	\$6,420	\$12,898	\$2,546	\$6,457	\$4,064	\$1,508	\$658	\$21,580	\$77,609	\$26,212	\$103,821

Scenario 1

ADDED MONTHLY RATE INCREASE DUE TO CAPITAL COSTS

(Includes Capital Expenditures Only)
(All cost amounts shown are in current Dollars)

Year	A Willow Park	B Aledo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	J Study Area Total	W'ford (excluding raw water)	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		\$0	
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		\$0	
2000	\$57	\$63	\$122	\$44	\$41	\$43	\$26	\$26	\$0		\$4	
2001	\$55	\$61	\$114	\$42	\$40	\$41	\$26	\$25	\$0		\$4	
2002	\$53	\$59	\$106	\$41	\$39	\$40	\$25	\$25	\$0		\$4	
2003	\$51	\$57	\$99	\$39	\$37	\$38	\$25	\$25	\$0		\$3	
2004	\$50	\$55	\$92	\$38	\$36	\$37	\$25	\$25	\$0		\$3	
2005	\$48	\$53	\$86	\$37	\$35	\$36	\$24	\$24	\$27		\$3	
2006	\$46	\$51	\$80	\$36	\$34	\$35	\$24	\$24	\$26		\$3	
2007	\$45	\$50	\$75	\$34	\$33	\$33	\$24	\$24	\$25		\$3	
2008	\$43	\$48	\$70	\$33	\$31	\$32	\$24	\$23	\$24		\$3	
2009	\$42	\$46	\$65	\$32	\$30	\$31	\$23	\$23	\$24		\$3	
2010	\$36	\$36	\$58	\$38	\$38	\$39	\$34	\$35	\$23		\$1	
2011	\$35	\$35	\$54	\$37	\$36	\$37	\$34	\$34	\$23		\$1	
2012	\$34	\$34	\$51	\$36	\$35	\$36	\$34	\$34	\$22		\$1	
2013	\$33	\$33	\$47	\$35	\$34	\$35	\$33	\$34	\$21		\$1	
2014	\$32	\$32	\$44	\$33	\$33	\$34	\$33	\$33	\$21		\$1	
2015	\$31	\$31	\$41	\$32	\$32	\$32	\$33	\$33	\$36		\$1	
2016	\$30	\$30	\$38	\$31	\$31	\$31	\$32	\$33	\$35		\$1	
2017	\$29	\$29	\$36	\$30	\$30	\$30	\$32	\$32	\$34		\$1	
2018	\$28	\$28	\$33	\$29	\$29	\$29	\$31	\$32	\$33		\$1	
2019	\$27	\$27	\$31	\$28	\$28	\$28	\$31	\$31	\$32		\$1	
2020	\$24	\$21	\$25	\$24	\$24	\$24	\$21	\$21	\$31		\$1	
2021	\$23	\$21	\$23	\$24	\$23	\$23	\$20	\$21	\$30		\$1	
2022	\$22	\$20	\$21	\$23	\$22	\$22	\$20	\$21	\$30		\$1	
2023	\$21	\$19	\$20	\$22	\$22	\$22	\$20	\$20	\$29		\$1	
2024	\$21	\$19	\$18	\$21	\$21	\$21	\$20	\$20	\$28		\$1	
2025	\$20	\$18	\$17	\$21	\$20	\$20	\$20	\$20	\$18		\$1	
2026	\$19	\$17	\$16	\$20	\$19	\$19	\$19	\$20	\$18		\$1	
2027	\$19	\$17	\$15	\$19	\$19	\$19	\$19	\$20	\$17		\$1	
2028	\$18	\$16	\$14	\$19	\$18	\$18	\$19	\$19	\$17		\$1	
2029	\$17	\$16	\$14	\$18	\$18	\$18	\$19	\$19	\$16		\$1	
2030	\$14	\$11	\$10	\$14	\$14	\$14	\$14	\$10	\$16		\$1	
2031	\$13	\$10	\$10	\$14	\$13	\$13	\$10	\$10	\$15		\$1	
2032	\$13	\$10	\$10	\$13	\$13	\$13	\$10	\$10	\$15		\$1	
2033	\$12	\$10	\$10	\$13	\$12	\$12	\$10	\$10	\$14		\$1	
2034	\$12	\$9	\$10	\$12	\$12	\$12	\$10	\$10	\$14		\$1	
2035	\$12	\$9	\$10	\$12	\$12	\$12	\$10	\$10	\$4		\$1	
2036	\$11	\$9	\$10	\$12	\$11	\$11	\$10	\$10	\$4		\$1	
2037	\$11	\$9	\$10	\$11	\$11	\$11	\$10	\$10	\$4		\$1	
2038	\$10	\$9	\$10	\$11	\$10	\$10	\$10	\$10	\$4		\$1	
2039	\$10	\$9	\$10	\$10	\$10	\$10	\$9	\$9	\$4		\$1	
2040	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$4		\$0	
2041	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3		\$0	
2042	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3		\$0	
2043	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3		\$0	
2044	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3		\$0	
2045	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$1		\$0	
2046	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$1		\$0	
2047	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$1		\$0	
2048	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$1		\$0	
2049	\$2	\$3	\$3	\$2	\$2	\$2	\$3	\$3	\$1		\$0	
2050	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1		\$0	

APPENDIX M - OPTION 3, SCENARIO 2

(This is only a partial printout of some of the more important sheets in the spreadsheet. For the rest of this scenario, or a scenario of your own, please use the spreadsheet in Appendix N.)

Input Run
Input Cities
Input Pipe
Input Cost
Treatment Chart
Construction Summary
Total Cost Summary
Treatment Chart Data
Actual Average Demand By Entity
Actual Design Demand By Entity
Raw Water Purchase Costs
Raw Water Transportation Costs
Pipe 1 Costs
Pipe 2 Costs
Willow Park Total Costs
Aledo Total Costs
Hudson Oaks Total Costs
Annetta North Total Costs
Annetta Total Costs
Annetta South Total Costs
Fort Worth North ETJ Total Costs
Fort Worth South ETJ Total Costs
Unincorporated Water Systems Total Costs
Weatherford Total Costs
Total Cost Annual Cost By Entity
Total Cost Added Monthly Rate By Entity
Capital Cost Summary
Capital Cost Annual Cost By Entity
Capital Cost Added Monthly Rate By Entity

Scenario 2

GENERAL INFORMATION FOR THIS RUN

Run Name	<i>Scenario 2</i>
Cost Basis	(All cost amounts shown are in current Dollars)
Cost Year	\$ 1999
Years for Facility Use Averaging	20

Run Description:

Areas Served:	Stand Alone Project - No Line Sharing with W'ford
Raw Water Transmission:	New System
Size of Initial Raw Water Line:	36"
Year of Initial Plant Operation:	2005
Size of Initial Plant:	2 MGD
Size of Intial Treated Water Exit Pipe:	10"
Initial Areas Served:	Aledo, Willow Park, Hudson Oaks

INPUT DATA

Entity	Annexation				Population				Maximum				Average				Construction				Year		Year		Inflation		Interest		Loan	
	Code	Area Growth Rate Per Year	Population Growth Rate Per Year	Population Density Per Acre	Population Curve Approximates	Average Demand Per Connection (gpm)	Based On	Construction Demand Per Connection (gpm)	Based On	Year To Start Regional Service	Year To Take Wells Off-Line	Inflation Rate (%)	Interest Rate (%)	Loan Term (years)	Year To Start Regional Service	Year To Take Wells Off-Line	Inflation Rate (%)	Interest Rate (%)	Loan Term (years)											
Willow Park	A	10.00%	3.40%	2.5	TWDB High	0.32	TWDB Avg.	0.6	TNRCC	2005	2010	4.50%	6.00%	20																
Alledo	B	10.00%	3.40%	2.5	TWDB High	0.32	TWDB Avg.	0.6	TNRCC	2005	2010	4.50%	6.00%	20																
Hudson Oaks	C	10.00%	7.31%	2.5	8yr COG	0.32	TWDB Avg.	0.6	TNRCC	2005	2010	4.50%	6.00%	20																
Annelta North	D	10.00%	3.47%	2.5	8yr COG	0.32	TWDB Avg.	0.6	TNRCC	2015	1998	4.50%	6.00%	20																
Annelta	E	10.00%	3.47%	2.5	8yr COG	0.32	TWDB Avg.	0.6	TNRCC	2015	1998	4.50%	6.00%	20																
Annelta South	F	10.00%	3.47%	2.5	8yr COG	0.32	TWDB Avg.	0.6	TNRCC	2015	1998	4.50%	6.00%	20																
Fort Worth ETJ North	G	20.00%	1.15%	2.5	TWDB High	0.32	TWDB Avg.	0.6	TNRCC	2020	1998	4.50%	6.00%	20																
Fort Worth ETJ South	H	20.00%	1.15%	2.5	TWDB High	0.32	TWDB Avg.	0.6	TNRCC	2020	1998	4.50%	6.00%	20																
Non-Municipal Water Utility SE Parker County	I	N/A	2.80%	2.5	8yr COG	0.32	TWDB Avg.	0.6	TNRCC	2025	1998	4.50%	6.00%	20																
Weatherford	J	10.00%	3.10%	2.5	TWDB High	0.32	TWDB Avg.	0.6	TNRCC	2051	2051	4.50%	6.00%	20																

Scenario 2

PIPE DATA

Pipe	Length (ft)	Row Width (ft)	Land Cost (\$/ft)	Start Building (year)	Initial Use (year)
1	57,000	20	\$22.00	2000	2005
2	1,470	20	\$22.00	2003	2005
3	3,680	15	\$16.50	2003	2005
4	26,250	15	\$16.50	2018	2020
5	310	15	\$16.50	2003	2005
6	310	15	\$16.50	2003	2005
7	12,970	15	\$16.50	2003	2005
8	4,910	15	\$16.50	2013	2015
9	6,660	15	\$16.50	2003	2005
10	2,820	15	\$16.50	2003	2005
11	2,080	15	\$16.50	2003	2005
12	1,480	15	\$16.50	2013	2015
13	10,690	15	\$16.50	2013	2015
14	3,190	15	\$16.50	2013	2015
15	6,660	15	\$16.50	2013	2015
16	37,910	15	\$16.50	2018	2020
17	6,400	15	\$16.50	2018	2020
18	17,880	15	\$16.50	2023	2025

Scenario 2

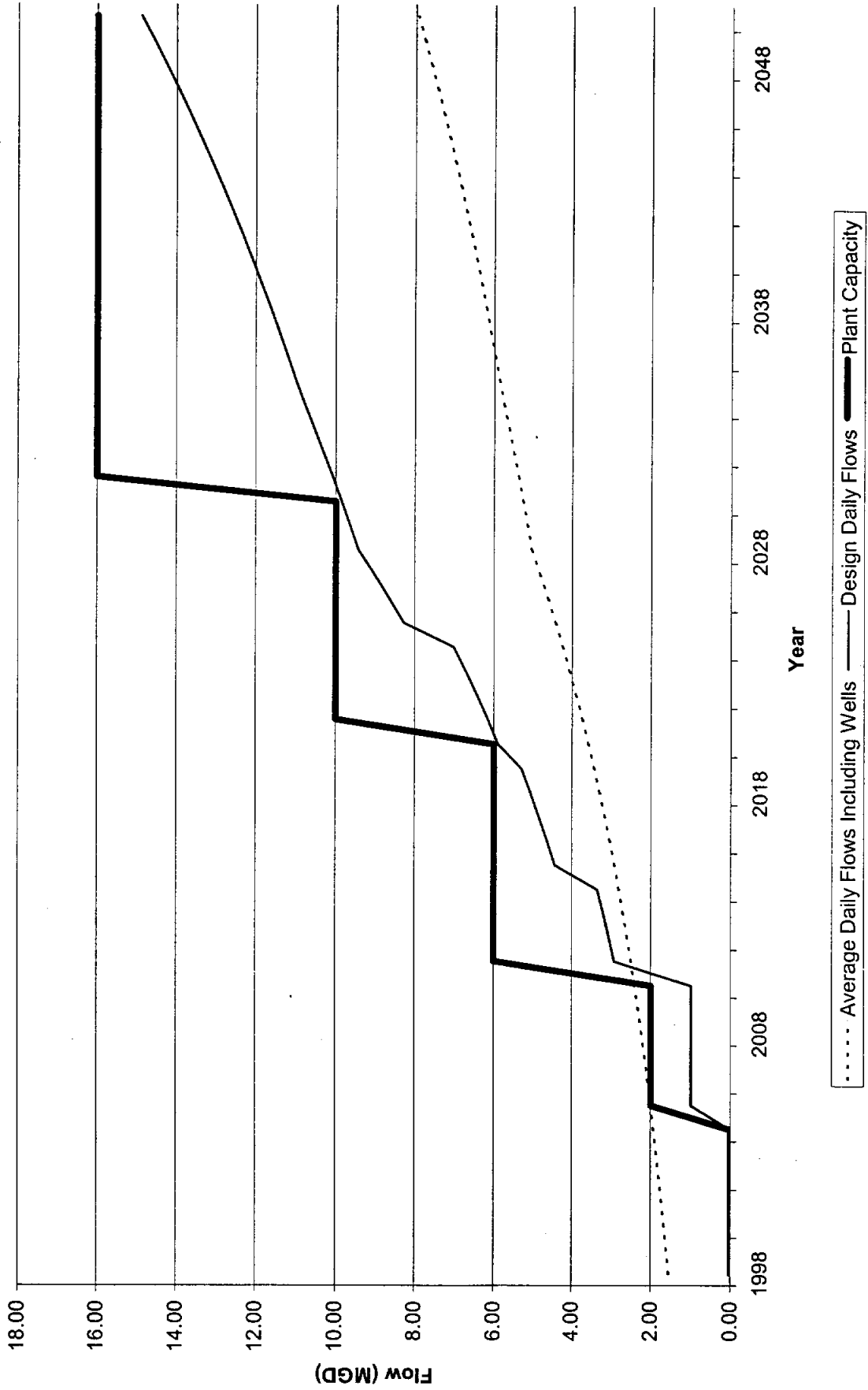
UNIT COST SUMMARY

Costs in 1999 Dollars

Note! Unit Costs include construction, engr, survey, legal, and admin.

Item	Unit	Total Unit Cost
Raw Water Purchase Rate	1000 gal	\$0.62
TRWD System Buy-in Cost	MGD Capacity	\$200,000.00
Intake Structure, 12 MGD	Each	\$472,500.00
Water Pump Station & Pumps	GPM Capacity	\$202.50
O&M, Pump Station	1000 gal	\$0.05
0.5 MGD Treatment Plant	Each	\$945,000.00
1.0 MGD Treatment Plant	Each	\$1,755,000.00
2.0 MGD Treatment Plant	Each	\$3,375,000.00
4.0 MGD Treatment Plant	Each	\$5,400,000.00
6.0 MGD Treatment Plant	Each	\$7,425,000.00
O&M, Treatment Plant	Gallon	\$0.08
Ground Storage Tank	Gallon	\$0.95
Elevated Storage Tank	Gallon	\$1.49
O&M, Storage Tank	Gallon	\$0.01
6" PVC Water Line and Fittings	L.F.	\$54.00
8" PVC Water Line and Fittings	L.F.	\$60.75
10" PVC Water Line and Fittings	L.F.	\$64.80
12" PVC Water Line and Fittings	L.F.	\$74.25
16" DIP/CYL Water Line and Fittings	L.F.	\$87.75
20" DIP/CYL Water Line and Fittings	L.F.	\$108.00
24" DIP/CYL Water Line and Fittings	L.F.	\$128.25
30" DIP/CYL Water Line and Fittings	L.F.	\$141.75
36" DIP/CYL Water Line and Fittings	L.F.	\$155.25
36" DIP/CYL Water Line Reimbursement	L.F.	\$112.05
O&M, Pipe Lines	L.F.	\$0.25
Purchase Site	Acre	\$16,500.00
Purchase 20' ROW	L.F.	\$27.50
15' Easement	L.F.	\$16.50
20' Easement	L.F.	\$22.00
No Cost Item		\$0.00

Treatment Plant Expansion



ANNUAL WATER PURCHASE AND IMPROVEMENT SUMMARY

Year	Raw Water Purchase Wtord 1000 gal	Raw Water Purchase SEPC 1000 gal	Intake Capacity Upgrade MGD	Raw Water Pumping Upgrade gpm	Treatment Plant Upgrade MGD	Storage Upgrade gal	Pumping Upgrade gpm	Pipe 1 Upgrade (in. dia.)	Pipe 2 Upgrade (in. dia.)	Pipe 3 Upgrade (in. dia.)	Pipe 4 Upgrade (in. dia.)	Pipe 5 Upgrade (in. dia.)	Pipe 6 Upgrade (in. dia.)	Pipe 7 Upgrade (in. dia.)	Pipe 8 Upgrade (in. dia.)	Pipe 9 Upgrade (in. dia.)	Pipe 10 Upgrade (in. dia.)	Pipe 11 Upgrade (in. dia.)	Pipe 12 Upgrade (in. dia.)	Pipe 13 Upgrade (in. dia.)	Pipe 14 Upgrade (in. dia.)	Pipe 15 Upgrade (in. dia.)	Pipe 16 Upgrade (in. dia.)	Pipe 17 Upgrade (in. dia.)	Pipe 18 Upgrade (in. dia.)		
1988																											
1989																											
2000																											
2001																											
2002																											
2003																											
2004																											
2005		438,590	12	10,000	2	2,500,000	5,000	16	10	10	10	10	10	6	6	6	10	6									
2006		457,993																									
2007		478,384																									
2008		489,821																									
2009		522,364																									
2010		546,060																									
2011		571,037			4	2,500,000																					
2012		597,310																									
2013		624,977																									
2014		654,123																									
2015		683,727						16																			
2016		902,313																									
2017		942,879																									
2018		985,543				2,500,000							16														
2019		1,030,427																									
2020		1,147,110									6																
2021		1,197,636			4																						
2022		1,250,817																									
2023		1,306,806																									
2024		1,365,775																									
2025		1,612,427				2,500,000	5,000																				
2026		1,683,077																									
2027		1,757,432						24																			
2028		1,835,715							20																		
2029		1,876,380																									
2030		1,917,598																									
2031		1,960,171																									
2032		2,004,143																									
2033		2,049,560											16														
2034		2,096,471																									
2035		2,139,894																									
2036		2,179,911																									
2037		2,221,234																									
2038		2,263,909																									
2039		2,307,978																									
2040		2,353,489																									
2041		2,400,488	12																								
2042		2,449,027																									
2043		2,498,156				2,500,000														16							
2044		2,550,927																									
2045		2,604,395																									
2046		2,659,617																									
2047		2,716,650							24																		
2048		2,775,556																									
2049		2,836,396		10,000			5,000																				
2050		2,899,235																									

Scenario 2

**AVERAGE DAILY DEMAND OF NEW FACILITIES BY ENTITY
(DISCONTINUE WELLS ON DATE SPECIFIED)**
(Includes Weatherford for Line 1)
(mgd)

Year to Start Regional Service	2005	2005	2005	2015	2015	2015	2020	2020	2025	2051
Year to Take Wells Off-line	2010	2010	2010	1998	1998	1998	1998	1998	1998	2051
Dependable Well Production	1.05	0.35	1.06	0.00	0.24	0.24	0.25	0.11	0.95	0.00

Year	A	B	C	D	E	F	G	H	I	J	Total	Total
	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta	Annetta South	Fort Worth North	Fort Worth South	Non-City SE Parker	W'ford		
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2005	0.59	0.30	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	1.20
2006	0.61	0.31	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.25
2007	0.63	0.32	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.31	1.31
2008	0.65	0.33	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37	1.37
2009	0.67	0.34	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.43	1.43
2010	0.70	0.35	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.50
2011	0.72	0.36	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.56	1.56
2012	0.75	0.37	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64	1.64
2013	0.77	0.39	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71	1.71
2014	0.80	0.40	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79	1.79
2015	0.82	0.41	0.64	0.10	0.24	0.15	0.00	0.00	0.00	0.00	2.37	2.37
2016	0.85	0.43	0.68	0.10	0.25	0.16	0.00	0.00	0.00	0.00	2.47	2.47
2017	0.88	0.44	0.73	0.10	0.26	0.16	0.00	0.00	0.00	0.00	2.58	2.58
2018	0.91	0.46	0.79	0.11	0.27	0.17	0.00	0.00	0.00	0.00	2.70	2.70
2019	0.94	0.47	0.84	0.11	0.28	0.17	0.00	0.00	0.00	0.00	2.82	2.82
2020	0.97	0.49	0.91	0.11	0.29	0.18	0.13	0.06	0.00	0.00	3.14	3.14
2021	1.01	0.51	0.97	0.12	0.30	0.19	0.13	0.06	0.00	0.00	3.28	3.28
2022	1.04	0.52	1.04	0.12	0.31	0.19	0.14	0.06	0.00	0.00	3.43	3.43
2023	1.08	0.54	1.12	0.13	0.32	0.20	0.14	0.06	0.00	0.00	3.58	3.58
2024	1.11	0.56	1.20	0.13	0.33	0.21	0.14	0.06	0.00	0.00	3.74	3.74
2025	1.15	0.58	1.29	0.13	0.34	0.21	0.14	0.06	0.51	0.00	4.42	4.42
2026	1.19	0.60	1.38	0.14	0.35	0.22	0.14	0.06	0.52	0.00	4.61	4.61
2027	1.23	0.62	1.49	0.14	0.36	0.23	0.14	0.06	0.53	0.00	4.81	4.81
2028	1.27	0.64	1.59	0.15	0.38	0.24	0.15	0.06	0.55	0.00	5.03	5.03
2029	1.32	0.66	1.60	0.15	0.39	0.25	0.15	0.06	0.56	0.00	5.14	5.14
2030	1.36	0.68	1.60	0.16	0.40	0.25	0.15	0.06	0.58	0.00	5.25	5.25
2031	1.41	0.71	1.60	0.16	0.42	0.26	0.15	0.07	0.60	0.00	5.37	5.37
2032	1.46	0.73	1.60	0.17	0.43	0.27	0.15	0.07	0.61	0.00	5.49	5.49
2033	1.51	0.76	1.60	0.18	0.45	0.28	0.15	0.07	0.63	0.00	5.62	5.62
2034	1.56	0.78	1.60	0.18	0.46	0.29	0.16	0.07	0.65	0.00	5.74	5.74
2035	1.61	0.79	1.60	0.19	0.48	0.30	0.16	0.07	0.67	0.00	5.86	5.86
2036	1.66	0.79	1.60	0.20	0.50	0.31	0.16	0.07	0.68	0.00	5.97	5.97
2037	1.72	0.79	1.60	0.20	0.51	0.32	0.16	0.07	0.70	0.00	6.09	6.09
2038	1.78	0.79	1.60	0.21	0.53	0.33	0.16	0.07	0.72	0.00	6.20	6.20
2039	1.84	0.79	1.60	0.22	0.55	0.35	0.16	0.07	0.74	0.00	6.32	6.32
2040	1.90	0.79	1.60	0.22	0.57	0.36	0.17	0.07	0.76	0.00	6.45	6.45
2041	1.97	0.79	1.60	0.23	0.59	0.37	0.17	0.07	0.79	0.00	6.58	6.58
2042	2.03	0.79	1.60	0.24	0.61	0.38	0.17	0.07	0.81	0.00	6.71	6.71
2043	2.10	0.79	1.60	0.25	0.63	0.40	0.17	0.08	0.83	0.00	6.85	6.85
2044	2.18	0.79	1.60	0.26	0.65	0.41	0.17	0.08	0.85	0.00	6.99	6.99
2045	2.25	0.79	1.60	0.27	0.67	0.42	0.18	0.08	0.88	0.00	7.14	7.14
2046	2.33	0.79	1.60	0.27	0.70	0.44	0.18	0.08	0.90	0.00	7.29	7.29
2047	2.40	0.79	1.60	0.28	0.72	0.45	0.18	0.08	0.93	0.00	7.44	7.44
2048	2.49	0.79	1.60	0.29	0.75	0.47	0.18	0.08	0.95	0.00	7.60	7.60
2049	2.57	0.79	1.60	0.30	0.77	0.49	0.18	0.08	0.98	0.00	7.77	7.77
2050	2.66	0.79	1.60	0.32	0.80	0.50	0.19	0.08	1.01	0.00	7.94	7.94

Scenario 2

**DESIGN WATER DEMAND OF NEW FACILITIES BY ENTITY
(DISCONTINUE WELLS ON DATE SPECIFIED)**
(Includes Weatherford for Line 1)
(mgd)

Year to Start Regional Service	2005	2005	2005	2015	2015	2015	2020	2020	2025	2051
Year to Take Wells Off-line	2010	2010	2010	1998	1998	1998	1998	1998	1998	2051
Dependable Well Production	1.05	0.35	0.55	0.00	0.24	0.24	0.25	0.11	0.95	0.00

Year	A	B	C	D	E	F	G	H	I	Total	J	Total
	Willow Park	Aledo	Hudson Oaks	Annetta North	Annetta	Annetta South	Fort Worth North	Fort Worth South	Non-City SE Parker		W'ford	
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2005	0.06	0.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.30
2006	0.09	0.22	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.40
2007	0.13	0.24	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.51
2008	0.17	0.26	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.62
2009	0.22	0.29	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.73
2010	0.26	0.31	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.86
2011	1.35	0.68	0.90	0.00	0.00	0.00	0.00	0.00	0.00	2.93	0.00	2.93
2012	1.40	0.70	0.97	0.00	0.00	0.00	0.00	0.00	0.00	3.07	0.00	3.07
2013	1.45	0.73	1.04	0.00	0.00	0.00	0.00	0.00	0.00	3.21	0.00	3.21
2014	1.50	0.75	1.11	0.00	0.00	0.00	0.00	0.00	0.00	3.36	0.00	3.36
2015	1.55	0.78	1.19	0.18	0.45	0.29	0.00	0.00	0.00	4.44	0.00	4.44
2016	1.60	0.80	1.28	0.19	0.47	0.30	0.00	0.00	0.00	4.64	0.00	4.64
2017	1.65	0.83	1.38	0.19	0.49	0.31	0.00	0.00	0.00	4.84	0.00	4.84
2018	1.71	0.86	1.48	0.20	0.50	0.32	0.00	0.00	0.00	5.06	0.00	5.06
2019	1.77	0.89	1.58	0.21	0.52	0.33	0.00	0.00	0.00	5.29	0.00	5.29
2020	1.83	0.92	1.70	0.21	0.54	0.34	0.25	0.11	0.00	5.89	0.00	5.89
2021	1.89	0.95	1.82	0.22	0.56	0.35	0.25	0.11	0.00	6.15	0.00	6.15
2022	1.95	0.98	1.96	0.23	0.58	0.36	0.25	0.11	0.00	6.43	0.00	6.43
2023	2.02	1.01	2.10	0.24	0.60	0.38	0.26	0.11	0.00	6.71	0.00	6.71
2024	2.09	1.05	2.25	0.24	0.62	0.39	0.26	0.11	0.00	7.02	0.00	7.02
2025	2.16	1.08	2.42	0.25	0.64	0.40	0.26	0.11	0.95	8.28	0.00	8.28
2026	2.23	1.12	2.60	0.26	0.66	0.42	0.27	0.12	0.97	8.65	0.00	8.65
2027	2.31	1.16	2.79	0.27	0.68	0.43	0.27	0.12	1.00	9.03	0.00	9.03
2028	2.39	1.20	2.99	0.28	0.71	0.45	0.27	0.12	1.03	9.43	0.00	9.43
2029	2.47	1.24	2.99	0.29	0.73	0.46	0.28	0.12	1.06	9.64	0.00	9.64
2030	2.55	1.28	2.99	0.30	0.76	0.48	0.28	0.12	1.09	9.85	0.00	9.85
2031	2.64	1.33	2.99	0.31	0.78	0.49	0.28	0.12	1.12	10.07	0.00	10.07
2032	2.73	1.37	2.99	0.32	0.81	0.51	0.28	0.12	1.15	10.30	0.00	10.30
2033	2.82	1.42	2.99	0.33	0.84	0.53	0.29	0.13	1.18	10.53	0.00	10.53
2034	2.92	1.47	2.99	0.34	0.87	0.55	0.29	0.13	1.22	10.77	0.00	10.77
2035	3.02	1.49	2.99	0.35	0.90	0.57	0.29	0.13	1.25	10.99	0.00	10.99
2036	3.12	1.49	2.99	0.37	0.93	0.59	0.30	0.13	1.28	11.20	0.00	11.20
2037	3.23	1.49	2.99	0.38	0.96	0.61	0.30	0.13	1.32	11.41	0.00	11.41
2038	3.34	1.49	2.99	0.39	1.00	0.63	0.31	0.13	1.36	11.63	0.00	11.63
2039	3.45	1.49	2.99	0.41	1.03	0.65	0.31	0.13	1.40	11.86	0.00	11.86
2040	3.57	1.49	2.99	0.42	1.07	0.67	0.31	0.14	1.43	12.09	0.00	12.09
2041	3.69	1.49	2.99	0.43	1.10	0.69	0.32	0.14	1.47	12.33	0.00	12.33
2042	3.81	1.49	2.99	0.45	1.14	0.72	0.32	0.14	1.52	12.58	0.00	12.58
2043	3.94	1.49	2.99	0.47	1.18	0.74	0.32	0.14	1.56	12.84	0.00	12.84
2044	4.08	1.49	2.99	0.48	1.22	0.77	0.33	0.14	1.60	13.10	0.00	13.10
2045	4.22	1.49	2.99	0.50	1.26	0.80	0.33	0.14	1.65	13.38	0.00	13.38
2046	4.36	1.49	2.99	0.52	1.31	0.82	0.33	0.15	1.69	13.66	0.00	13.66
2047	4.51	1.49	2.99	0.53	1.35	0.85	0.34	0.15	1.74	13.96	0.00	13.96
2048	4.66	1.49	2.99	0.55	1.40	0.88	0.34	0.15	1.79	14.26	0.00	14.26
2049	4.82	1.49	2.99	0.57	1.45	0.91	0.35	0.15	1.84	14.57	0.00	14.57
2050	4.98	1.49	2.99	0.59	1.50	0.94	0.35	0.15	1.89	14.89	0.00	14.89

Scenario 2

COST OF PURCHASING RAW WATER
(All cost amounts shown are in current Dollars)

Year of First Use	Annual Raw Water Use (excl W'ford)	Raw Water Purchase Price	Plant Design Capacity	Buy-in Cost (\$/mgd Capacity)						
2005	1 MGD	\$0.62		\$200,000.00						
Based on Average Daily Use		Based on Design Flows 0.60 gpm/ customer					Total Annual Cost			
Year	Raw Water Used 1000 Gal	Raw Water Purchase \$/ 1000 gal	Raw Water Flows (MGD)	Raw Water Use Based on Plant Capacity			TRWD System Buy In \$ 1998	Capital \$ 1998	O&M \$ 1998	Total \$ 1998
				Plant Size (MGD)	Excess Capacity (MGD)	Plant Upgrade (MGD)				
1998	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	
1999	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	
2000	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	
2001	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	
2002	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	
2003	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	
2004	0	\$0	0.00	0.00	0.00	0.00	\$0	\$0	\$0	
2005	438,590	\$271,926	1.00	2.00	1.00	2.00	\$400,000	\$400,000	\$271,926	\$671,926
2006	457,993	\$283,956	1.00	2.00	1.00	2.00	\$0	\$0	\$283,956	\$283,956
2007	478,384	\$296,598	1.00	2.00	1.00	2.00	\$0	\$0	\$296,598	\$296,598
2008	499,821	\$309,889	1.00	2.00	1.00	2.00	\$0	\$0	\$309,889	\$309,889
2009	522,364	\$323,866	1.00	2.00	1.00	2.00	\$0	\$0	\$323,866	\$323,866
2010	546,080	\$338,569	1.00	2.00	1.00	2.00	\$0	\$0	\$338,569	\$338,569
2011	571,037	\$354,043	2.93	6.00	3.07	4.00	\$800,000	\$800,000	\$354,043	\$1,154,043
2012	597,310	\$370,332	3.07	6.00	2.93	4.00	\$0	\$0	\$370,332	\$370,332
2013	624,977	\$387,486	3.21	6.00	2.79	4.00	\$0	\$0	\$387,486	\$387,486
2014	654,123	\$405,557	3.36	6.00	2.64	4.00	\$0	\$0	\$405,557	\$405,557
2015	863,727	\$535,511	4.44	6.00	1.56	4.00	\$0	\$0	\$535,511	\$535,511
2016	902,313	\$559,434	4.64	6.00	1.36	4.00	\$0	\$0	\$559,434	\$559,434
2017	942,879	\$584,585	4.84	6.00	1.16	4.00	\$0	\$0	\$584,585	\$584,585
2018	985,543	\$611,036	5.06	6.00	0.94	4.00	\$0	\$0	\$611,036	\$611,036
2019	1,030,427	\$638,865	5.29	6.00	0.71	4.00	\$0	\$0	\$638,865	\$638,865
2020	1,147,110	\$711,208	5.89	6.00	0.11	4.00	\$0	\$0	\$711,208	\$711,208
2021	1,197,638	\$742,535	6.15	10.00	3.85	4.00	\$800,000	\$800,000	\$742,535	\$1,542,535
2022	1,250,817	\$775,506	6.43	10.00	3.57	4.00	\$0	\$0	\$775,506	\$775,506
2023	1,306,806	\$810,220	6.71	10.00	3.29	4.00	\$0	\$0	\$810,220	\$810,220
2024	1,365,775	\$846,780	7.02	10.00	2.98	4.00	\$0	\$0	\$846,780	\$846,780
2025	1,612,427	\$999,705	8.28	10.00	1.72	4.00	\$0	\$0	\$999,705	\$999,705
2026	1,683,077	\$1,043,508	8.65	10.00	1.35	4.00	\$0	\$0	\$1,043,508	\$1,043,508
2027	1,757,432	\$1,089,608	9.03	10.00	0.97	4.00	\$0	\$0	\$1,089,608	\$1,089,608
2028	1,835,715	\$1,138,143	9.43	10.00	0.57	4.00	\$0	\$0	\$1,138,143	\$1,138,143
2029	1,876,380	\$1,163,356	9.64	10.00	0.36	4.00	\$0	\$0	\$1,163,356	\$1,163,356
2030	1,917,599	\$1,188,911	9.85	10.00	0.15	4.00	\$0	\$0	\$1,188,911	\$1,188,911
2031	1,960,171	\$1,215,306	10.07	16.00	5.93	6.00	\$1,200,000	\$1,200,000	\$1,215,306	\$2,415,306
2032	2,004,143	\$1,242,569	10.30	16.00	5.70	6.00	\$0	\$0	\$1,242,569	\$1,242,569
2033	2,049,560	\$1,270,727	10.53	16.00	5.47	6.00	\$0	\$0	\$1,270,727	\$1,270,727
2034	2,096,471	\$1,299,812	10.77	16.00	5.23	6.00	\$0	\$0	\$1,299,812	\$1,299,812
2035	2,139,894	\$1,326,734	10.99	16.00	5.01	6.00	\$0	\$0	\$1,326,734	\$1,326,734
2036	2,179,911	\$1,351,545	11.20	16.00	4.80	6.00	\$0	\$0	\$1,351,545	\$1,351,545
2037	2,221,234	\$1,377,165	11.41	16.00	4.59	6.00	\$0	\$0	\$1,377,165	\$1,377,165
2038	2,263,909	\$1,403,623	11.63	16.00	4.37	6.00	\$0	\$0	\$1,403,623	\$1,403,623
2039	2,307,978	\$1,430,946	11.86	16.00	4.14	6.00	\$0	\$0	\$1,430,946	\$1,430,946
2040	2,353,489	\$1,459,163	12.09	16.00	3.91	6.00	\$0	\$0	\$1,459,163	\$1,459,163
2041	2,400,488	\$1,488,303	12.33	16.00	3.67	6.00	\$0	\$0	\$1,488,303	\$1,488,303
2042	2,449,027	\$1,518,397	12.58	16.00	3.42	6.00	\$0	\$0	\$1,518,397	\$1,518,397
2043	2,499,156	\$1,549,476	12.84	16.00	3.16	6.00	\$0	\$0	\$1,549,476	\$1,549,476
2044	2,550,927	\$1,581,575	13.10	16.00	2.90	6.00	\$0	\$0	\$1,581,575	\$1,581,575
2045	2,604,395	\$1,614,725	13.38	16.00	2.62	6.00	\$0	\$0	\$1,614,725	\$1,614,725
2046	2,659,617	\$1,648,962	13.66	16.00	2.34	6.00	\$0	\$0	\$1,648,962	\$1,648,962
2047	2,716,650	\$1,684,323	13.96	16.00	2.04	6.00	\$0	\$0	\$1,684,323	\$1,684,323
2048	2,775,556	\$1,720,845	14.26	16.00	1.74	6.00	\$0	\$0	\$1,720,845	\$1,720,845
2049	2,836,396	\$1,758,566	14.57	16.00	1.43	6.00	\$0	\$0	\$1,758,566	\$1,758,566
2050	2,899,235	\$1,797,526	14.89	16.00	1.11	6.00	\$0	\$0	\$1,797,526	\$1,797,526

Scenario 2

RAW WATER INTAKE AND PUMPING
(Includes Weatherford)
(All cost amounts shown are in current Dollars)

Year of First Use	Upgrade Increment (MGD)	Construction Cost Per Increment	Upgrade Increment Gallons	Cost Per GPM Capacity	Construction Cost Per Increment	Cost Per 1000 Gal									
2005	12	\$472,500	10000	\$203	\$2,025,000	\$0.05									
Capital Costs Based on 0.6 gpm per customer											O&M Costs		Total Annual Cost		
Year	Intake Structure				Pumping					Raw Water Pumping Equipment \$ 1998	Annual Flow 1000 gal	Raw Water Pumping \$ 1998	Capital \$ 1998	O&M \$ 1998	Total \$ 1998
	Design Daily Flows (MGD)	Build 12 MGD Intake (MGD)	Excess Capacity (MGD)	Intake Capacity Addition (MGD)	Raw Water Intake \$ 1998	Required Flow Capacity (gpm)	Actual Flow Capacity (gpm)	Excess Capacity (gpm)	Pumping Capacity Addition (gpm)						
1998	0.00	0.00	0.00	0.00	\$0	0	0	0	0	\$0	0	\$0	\$0	\$0	\$0
1999	0.00	0.00	0.00	0.00	\$0	0	0	0	0	\$0	0	\$0	\$0	\$0	\$0
2000	0.00	0.00	0.00	0.00	\$0	0	0	0	0	\$0	0	\$0	\$0	\$0	\$0
2001	0.00	0.00	0.00	0.00	\$0	0	0	0	0	\$0	0	\$0	\$0	\$0	\$0
2002	0.00	0.00	0.00	0.00	\$0	0	0	0	0	\$0	0	\$0	\$0	\$0	\$0
2003	0.00	0.00	0.00	0.00	\$0	0	0	0	0	\$0	0	\$0	\$0	\$0	\$0
2004	0.00	0.00	0.00	0.00	\$0	0	0	0	0	\$0	0	\$0	\$0	\$0	\$0
2005	0.30	12.00	11.70	12.00	\$472,500	210	10,000	9,790	10,000	\$2,025,000	110,607	\$5,530	\$2,497,500	\$5,530	\$2,503,030
2006	0.40	12.00	11.60	0.00	\$0	280	10,000	9,720	0	\$0	146,988	\$7,349	\$0	\$7,349	\$7,349
2007	0.51	12.00	11.49	0.00	\$0	352	10,000	9,648	0	\$0	185,221	\$9,261	\$0	\$9,261	\$9,261
2008	0.62	12.00	11.38	0.00	\$0	429	10,000	9,571	0	\$0	225,414	\$11,271	\$0	\$11,271	\$11,271
2009	0.73	12.00	11.27	0.00	\$0	509	10,000	9,491	0	\$0	267,683	\$13,384	\$0	\$13,384	\$13,384
2010	0.86	12.00	11.14	0.00	\$0	594	10,000	9,406	0	\$0	312,150	\$15,607	\$0	\$15,607	\$15,607
2011	2.93	12.00	9.07	0.00	\$0	2,037	10,000	7,963	0	\$0	1,070,694	\$53,535	\$0	\$53,535	\$53,535
2012	3.07	12.00	8.93	0.00	\$0	2,131	10,000	7,869	0	\$0	1,119,956	\$55,998	\$0	\$55,998	\$55,998
2013	3.21	12.00	8.79	0.00	\$0	2,229	10,000	7,771	0	\$0	1,171,833	\$58,592	\$0	\$58,592	\$58,592
2014	3.36	12.00	8.64	0.00	\$0	2,333	10,000	7,667	0	\$0	1,226,482	\$61,324	\$0	\$61,324	\$61,324
2015	4.44	12.00	7.56	0.00	\$0	3,081	10,000	6,919	0	\$0	1,619,488	\$80,974	\$0	\$80,974	\$80,974
2016	4.64	12.00	7.36	0.00	\$0	3,219	10,000	6,781	0	\$0	1,691,836	\$84,592	\$0	\$84,592	\$84,592
2017	4.84	12.00	7.16	0.00	\$0	3,364	10,000	6,636	0	\$0	1,767,898	\$88,395	\$0	\$88,395	\$88,395
2018	5.06	12.00	6.94	0.00	\$0	3,516	10,000	6,484	0	\$0	1,847,893	\$92,395	\$0	\$92,395	\$92,395
2019	5.29	12.00	6.71	0.00	\$0	3,676	10,000	6,324	0	\$0	1,932,051	\$96,603	\$0	\$96,603	\$96,603
2020	5.89	12.00	6.11	0.00	\$0	4,092	10,000	5,908	0	\$0	2,150,831	\$107,542	\$0	\$107,542	\$107,542
2021	6.15	12.00	5.85	0.00	\$0	4,272	10,000	5,728	0	\$0	2,245,571	\$112,279	\$0	\$112,279	\$112,279
2022	6.43	12.00	5.57	0.00	\$0	4,462	10,000	5,538	0	\$0	2,345,281	\$117,264	\$0	\$117,264	\$117,264
2023	6.71	12.00	5.29	0.00	\$0	4,662	10,000	5,338	0	\$0	2,450,261	\$122,513	\$0	\$122,513	\$122,513
2024	7.02	12.00	4.98	0.00	\$0	4,872	10,000	5,128	0	\$0	2,560,828	\$128,041	\$0	\$128,041	\$128,041
2025	8.28	12.00	3.72	0.00	\$0	5,752	10,000	4,248	0	\$0	3,023,300	\$151,165	\$0	\$151,165	\$151,165
2026	8.65	12.00	3.35	0.00	\$0	6,004	10,000	3,996	0	\$0	3,155,770	\$157,788	\$0	\$157,788	\$157,788
2027	9.03	12.00	2.97	0.00	\$0	6,269	10,000	3,731	0	\$0	3,295,185	\$164,759	\$0	\$164,759	\$164,759
2028	9.43	12.00	2.57	0.00	\$0	6,549	10,000	3,451	0	\$0	3,441,965	\$172,098	\$0	\$172,098	\$172,098
2029	9.64	12.00	2.36	0.00	\$0	6,694	10,000	3,306	0	\$0	3,518,213	\$175,911	\$0	\$175,911	\$175,911
2030	9.85	12.00	2.15	0.00	\$0	6,841	10,000	3,159	0	\$0	3,595,498	\$179,775	\$0	\$179,775	\$179,775
2031	10.07	12.00	1.93	0.00	\$0	6,993	10,000	3,007	0	\$0	3,675,321	\$183,766	\$0	\$183,766	\$183,766
2032	10.30	12.00	1.70	0.00	\$0	7,149	10,000	2,851	0	\$0	3,757,768	\$187,888	\$0	\$187,888	\$187,888
2033	10.53	12.00	1.47	0.00	\$0	7,311	10,000	2,689	0	\$0	3,842,925	\$192,146	\$0	\$192,146	\$192,146
2034	10.77	12.00	1.23	0.00	\$0	7,479	10,000	2,521	0	\$0	3,930,882	\$196,544	\$0	\$196,544	\$196,544
2035	10.99	12.00	1.01	0.00	\$0	7,634	10,000	2,366	0	\$0	4,012,301	\$200,615	\$0	\$200,615	\$200,615
2036	11.20	12.00	0.80	0.00	\$0	7,776	10,000	2,224	0	\$0	4,087,332	\$204,367	\$0	\$204,367	\$204,367
2037	11.41	12.00	0.59	0.00	\$0	7,924	10,000	2,076	0	\$0	4,164,815	\$208,241	\$0	\$208,241	\$208,241
2038	11.63	12.00	0.37	0.00	\$0	8,076	10,000	1,924	0	\$0	4,244,829	\$212,241	\$0	\$212,241	\$212,241
2039	11.86	12.00	0.14	0.00	\$0	8,233	10,000	1,767	0	\$0	4,327,458	\$216,373	\$0	\$216,373	\$216,373
2040	12.09	24.00	11.91	12.00	\$472,500	8,396	10,000	1,604	0	\$0	4,412,791	\$220,640	\$472,500	\$220,640	\$693,140
2041	12.33	24.00	11.67	0.00	\$0	8,563	10,000	1,437	0	\$0	4,500,916	\$225,046	\$0	\$225,046	\$225,046
2042	12.58	24.00	11.42	0.00	\$0	8,736	10,000	1,264	0	\$0	4,591,926	\$229,596	\$0	\$229,596	\$229,596
2043	12.84	24.00	11.16	0.00	\$0	8,915	10,000	1,085	0	\$0	4,685,917	\$234,296	\$0	\$234,296	\$234,296
2044	13.10	24.00	10.90	0.00	\$0	9,100	10,000	900	0	\$0	4,782,987	\$239,149	\$0	\$239,149	\$239,149
2045	13.38	24.00	10.62	0.00	\$0	9,291	10,000	709	0	\$0	4,883,240	\$244,162	\$0	\$244,162	\$244,162
2046	13.66	24.00	10.34	0.00	\$0	9,488	10,000	512	0	\$0	4,986,781	\$249,339	\$0	\$249,339	\$249,339
2047	13.96	24.00	10.04	0.00	\$0	9,691	10,000	309	0	\$0	5,093,719	\$254,686	\$0	\$254,686	\$254,686
2048	14.26	24.00	9.74	0.00	\$0	9,901	10,000	99	0	\$0	5,204,168	\$260,208	\$0	\$260,208	\$260,208
2049	14.57	24.00	9.43	0.00	\$0	10,118	20,000	9,882	10,000	\$2,025,000	5,318,243	\$265,912	\$2,025,000	\$265,912	\$2,290,912
2050	14.89	24.00	9.11	0.00	\$0	10,343	20,000	9,657	0	\$0	5,436,066	\$271,803	\$0	\$271,803	\$271,803

Scenario 2

PIPE 1 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot
2005	2000	57000	20	\$22.00	\$1,254,000	1	\$0.25

Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	None	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	None	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$1,254,000	0.00	0	0	None	0	0	\$0	\$0	\$1,254,000	\$0	\$1,254,000
2001	\$0	0.00	0	0	None	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	None	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$0	0.00	0	0	None	0	0	\$0	\$0	\$0	\$0	\$0
2004	\$0	0.00	0	0	None	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.30	3	16	None	0	13	\$912,000	\$14,250	\$912,000	\$14,250	\$926,250
2006	\$0	0.40	4	16	None	0	12	\$0	\$14,250	\$0	\$14,250	\$14,250
2007	\$0	0.51	4	16	None	0	12	\$0	\$14,250	\$0	\$14,250	\$14,250
2008	\$0	0.62	5	16	None	0	11	\$0	\$14,250	\$0	\$14,250	\$14,250
2009	\$0	0.73	5	16	None	0	11	\$0	\$14,250	\$0	\$14,250	\$14,250
2010	\$0	0.86	6	16	None	0	10	\$0	\$14,250	\$0	\$14,250	\$14,250
2011	\$0	2.93	10	16	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2012	\$0	3.07	10	16	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2013	\$0	3.21	10	16	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2014	\$0	3.36	10	16	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2015	\$0	4.44	12	16	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2016	\$0	4.64	12	16	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2017	\$0	4.84	12	16	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2018	\$0	5.06	13	16	None	0	3	\$0	\$14,250	\$0	\$14,250	\$14,250
2019	\$0	5.29	13	16	None	0	3	\$0	\$14,250	\$0	\$14,250	\$14,250
2020	\$0	5.89	14	16	None	0	2	\$0	\$14,250	\$0	\$14,250	\$14,250
2021	\$0	6.15	14	16	None	0	2	\$0	\$14,250	\$0	\$14,250	\$14,250
2022	\$0	6.43	14	16	None	0	2	\$0	\$14,250	\$0	\$14,250	\$14,250
2023	\$0	6.71	15	16	None	0	1	\$0	\$14,250	\$0	\$14,250	\$14,250
2024	\$0	7.02	15	16	None	0	1	\$0	\$14,250	\$0	\$14,250	\$14,250
2025	\$0	8.28	16	16	None	0	0	\$0	\$14,250	\$0	\$14,250	\$14,250
2026	\$0	8.65	16	16	None	0	0	\$0	\$14,250	\$0	\$14,250	\$14,250
2027	\$0	9.03	17	24	None	0	7	\$1,368,000	\$14,250	\$1,368,000	\$14,250	\$1,382,250
2028	\$0	9.43	17	24	None	0	7	\$0	\$14,250	\$0	\$14,250	\$14,250
2029	\$0	9.64	17	24	None	0	7	\$0	\$14,250	\$0	\$14,250	\$14,250
2030	\$0	9.85	18	24	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2031	\$0	10.07	18	24	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2032	\$0	10.30	18	24	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2033	\$0	10.53	18	24	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2034	\$0	10.77	18	24	None	0	6	\$0	\$14,250	\$0	\$14,250	\$14,250
2035	\$0	10.99	19	24	None	0	5	\$0	\$14,250	\$0	\$14,250	\$14,250
2036	\$0	11.20	19	24	None	0	5	\$0	\$14,250	\$0	\$14,250	\$14,250
2037	\$0	11.41	19	24	None	0	5	\$0	\$14,250	\$0	\$14,250	\$14,250
2038	\$0	11.63	19	24	None	0	5	\$0	\$14,250	\$0	\$14,250	\$14,250
2039	\$0	11.86	19	24	None	0	5	\$0	\$14,250	\$0	\$14,250	\$14,250
2040	\$0	12.09	19	24	None	0	5	\$0	\$14,250	\$0	\$14,250	\$14,250
2041	\$0	12.33	20	24	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2042	\$0	12.58	20	24	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2043	\$0	12.84	20	24	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2044	\$0	13.10	20	24	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2045	\$0	13.38	20	24	None	0	4	\$0	\$14,250	\$0	\$14,250	\$14,250
2046	\$0	13.66	21	24	None	0	3	\$0	\$14,250	\$0	\$14,250	\$14,250
2047	\$0	13.96	21	24	None	0	3	\$0	\$14,250	\$0	\$14,250	\$14,250
2048	\$0	14.26	21	24	None	0	3	\$0	\$14,250	\$0	\$14,250	\$14,250
2049	\$0	14.57	21	24	None	0	3	\$0	\$14,250	\$0	\$14,250	\$14,250
2050	\$0	14.89	21	24	None	0	3	\$0	\$14,250	\$0	\$14,250	\$14,250

Scenario 2

PIPE 2 COSTS

(All cost amounts shown are in current Dollars)

Year of First Use	Year to Construct Line	Linear Feet	Row/ Easement Width (ft.)	Land Cost Per L.F.	Land Cost	Pipe Number	Cost Per Foot					
2005	2003	1470	20	\$22.00	\$32,340	2	0.25					
Year	Capital Costs								O&M	Total Annual Cost		
	Easement Cost \$ 1999	Design Flow (mgd)	Size Needed (in. dia.)	Size Supplied (in. dia.)	Upstream Pipe Size (in. dia.)	Upstream Pipe Flag (in. dia.)	Size Excess (in. dia.)	Piping Cost \$ 1999	Annual Cost \$ 1999	Capital \$ 1999	O&M \$ 1999	Total \$ 1999
1998	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
1999	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2000	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2001	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2002	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2003	\$32,340	0.00	0	0	0	0	0	\$0	\$0	\$32,340	\$0	\$32,340
2004	\$0	0.00	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0
2005	\$0	0.30	3	10	16	0	7	\$14,700	\$368	\$14,700	\$368	\$15,068
2006	\$0	0.40	4	10	16	0	6	\$0	\$368	\$0	\$368	\$368
2007	\$0	0.51	4	10	16	0	6	\$0	\$368	\$0	\$368	\$368
2008	\$0	0.62	5	10	16	0	5	\$0	\$368	\$0	\$368	\$368
2009	\$0	0.73	5	10	16	0	5	\$0	\$368	\$0	\$368	\$368
2010	\$0	0.86	6	10	16	0	4	\$0	\$368	\$0	\$368	\$368
2011	\$0	2.93	10	10	16	0	0	\$0	\$368	\$0	\$368	\$368
2012	\$0	3.07	10	10	16	0	0	\$0	\$368	\$0	\$368	\$368
2013	\$0	3.21	10	10	16	0	0	\$0	\$368	\$0	\$368	\$368
2014	\$0	3.36	10	10	16	0	0	\$0	\$368	\$0	\$368	\$368
2015	\$0	4.44	12	16	16	0	4	\$23,520	\$368	\$23,520	\$368	\$23,888
2016	\$0	4.64	12	16	16	0	4	\$0	\$368	\$0	\$368	\$368
2017	\$0	4.84	12	16	16	0	4	\$0	\$368	\$0	\$368	\$368
2018	\$0	5.06	13	16	16	0	3	\$0	\$368	\$0	\$368	\$368
2019	\$0	5.29	13	16	16	0	3	\$0	\$368	\$0	\$368	\$368
2020	\$0	5.89	14	16	16	0	2	\$0	\$368	\$0	\$368	\$368
2021	\$0	6.15	14	16	16	0	2	\$0	\$368	\$0	\$368	\$368
2022	\$0	6.43	14	16	16	0	2	\$0	\$368	\$0	\$368	\$368
2023	\$0	6.71	15	16	16	0	1	\$0	\$368	\$0	\$368	\$368
2024	\$0	7.02	15	16	16	0	1	\$0	\$368	\$0	\$368	\$368
2025	\$0	8.28	16	16	16	0	0	\$0	\$368	\$0	\$368	\$368
2026	\$0	8.65	16	16	16	0	0	\$0	\$368	\$0	\$368	\$368
2027	\$0	9.03	17	20	24	0	3	\$29,400	\$368	\$29,400	\$368	\$29,768
2028	\$0	9.43	17	20	24	0	3	\$0	\$368	\$0	\$368	\$368
2029	\$0	9.64	17	20	24	0	3	\$0	\$368	\$0	\$368	\$368
2030	\$0	9.85	18	20	24	0	2	\$0	\$368	\$0	\$368	\$368
2031	\$0	10.07	18	20	24	0	2	\$0	\$368	\$0	\$368	\$368
2032	\$0	10.30	18	20	24	0	2	\$0	\$368	\$0	\$368	\$368
2033	\$0	10.53	18	20	24	0	2	\$0	\$368	\$0	\$368	\$368
2034	\$0	10.77	18	20	24	0	2	\$0	\$368	\$0	\$368	\$368
2035	\$0	10.99	19	20	24	0	1	\$0	\$368	\$0	\$368	\$368
2036	\$0	11.20	19	20	24	0	1	\$0	\$368	\$0	\$368	\$368
2037	\$0	11.41	19	20	24	0	1	\$0	\$368	\$0	\$368	\$368
2038	\$0	11.63	19	20	24	0	1	\$0	\$368	\$0	\$368	\$368
2039	\$0	11.86	19	20	24	0	1	\$0	\$368	\$0	\$368	\$368
2040	\$0	12.09	19	20	24	0	1	\$0	\$368	\$0	\$368	\$368
2041	\$0	12.33	20	20	24	0	0	\$0	\$368	\$0	\$368	\$368
2042	\$0	12.58	20	20	24	0	0	\$0	\$368	\$0	\$368	\$368
2043	\$0	12.84	20	20	24	0	0	\$0	\$368	\$0	\$368	\$368
2044	\$0	13.10	20	20	24	0	0	\$0	\$368	\$0	\$368	\$368
2045	\$0	13.38	20	20	24	0	0	\$0	\$368	\$0	\$368	\$368
2046	\$0	13.66	21	24	24	0	3	\$35,280	\$368	\$35,280	\$368	\$35,648
2047	\$0	13.96	21	24	24	0	3	\$0	\$368	\$0	\$368	\$368
2048	\$0	14.26	21	24	24	0	3	\$0	\$368	\$0	\$368	\$368
2049	\$0	14.57	21	24	24	0	3	\$0	\$368	\$0	\$368	\$368
2050	\$0	14.89	21	24	24	0	3	\$0	\$368	\$0	\$368	\$368

Scenario 2

WILLOW PARK TOTAL COSTS
(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$464,216	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$464,216
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$57,809	\$0	\$11,331	\$30,991	\$0	\$2,660	\$5,115	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$107,908	
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$228,928	\$652,794	\$1,177,135	\$1,976,213	\$315,578	\$5,134	\$18,707	\$0	\$1,617	\$3,177	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,579,284	
2006	\$94,573	\$2,448	\$26,645	\$17,444	\$4,746	\$122	\$450	\$0	\$39	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$146,545	
2007	\$86,757	\$3,021	\$26,098	\$17,084	\$4,649	\$120	\$444	\$0	\$39	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$148,289	
2008	\$99,170	\$3,607	\$25,602	\$16,794	\$4,560	\$118	\$438	\$0	\$38	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$150,404	
2009	\$101,794	\$4,207	\$25,145	\$16,546	\$4,479	\$116	\$432	\$0	\$38	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$152,833	
2010	\$104,811	\$4,832	\$24,766	\$16,325	\$4,411	\$114	\$426	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$155,801	
2011	\$352,698	\$16,361	\$1,722,068	\$1,410,781	\$4,355	\$112	\$425	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,508,914	
2012	\$110,657	\$16,732	\$73,347	\$37,681	\$4,258	\$110	\$419	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$243,319	
2013	\$113,462	\$17,157	\$75,207	\$37,199	\$4,173	\$108	\$414	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$247,833	
2014	\$116,620	\$17,634	\$77,300	\$36,816	\$4,098	\$106	\$410	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$253,097	
2015	\$151,514	\$22,910	\$100,429	\$41,888	\$4,032	\$6,759	\$407	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$330,987	
2016	\$156,940	\$23,731	\$104,026	\$41,671	\$3,998	\$103	\$405	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$341,582	
2017	\$182,873	\$24,628	\$107,958	\$41,543	\$3,970	\$102	\$404	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,470,578	
2018	\$169,373	\$25,605	\$112,243	\$1,130,695	\$3,949	\$102	\$26,253	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$373,093	
2019	\$176,363	\$26,668	\$116,900	\$48,611	\$3,934	\$101	\$404	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$410,263	
2020	\$195,839	\$29,613	\$129,809	\$50,459	\$3,924	\$101	\$405	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,134,924	
2021	\$425,022	\$30,937	\$162,349	\$50,919	\$3,926	\$101	\$407	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$444,429	
2022	\$214,056	\$32,367	\$141,684	\$51,564	\$3,933	\$101	\$410	\$0	\$36	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$463,811	
2023	\$224,276	\$33,913	\$148,658	\$52,390	\$3,945	\$102	\$413	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$484,859	
2024	\$235,313	\$35,582	\$155,974	\$53,397	\$3,960	\$102	\$413	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,811,617	
2025	\$279,180	\$42,215	\$185,051	\$1,300,554	\$3,979	\$103	\$421	\$0	\$37	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$606,472	
2026	\$294,394	\$44,515	\$195,135	\$67,764	\$4,020	\$104	\$426	\$0	\$38	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,037,327	
2027	\$310,817	\$46,999	\$206,021	\$70,158	\$394,295	\$8,491	\$431	\$0	\$38	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$673,642	
2028	\$328,556	\$49,681	\$217,780	\$72,849	\$4,114	\$105	\$437	\$0	\$39	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$696,711	
2029	\$340,164	\$51,436	\$225,473	\$74,802	\$4,167	\$107	\$444	\$0	\$40	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$720,472	
2030	\$352,112	\$53,243	\$233,393	\$76,828	\$4,220	\$109	\$450	\$0	\$40	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,372,218	
2031	\$374,725	\$55,124	\$246,866	\$1,118,738	\$4,275	\$110	\$457	\$0	\$40	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$772,962	
2032	\$374,725	\$56,862	\$248,382	\$89,207	\$4,287	\$111	\$460	\$0	\$40	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$799,580	
2033	\$365,321	\$58,264	\$255,405	\$90,616	\$4,321	\$111	\$463	\$0	\$41	\$5,037	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$817,203	
2034	\$396,367	\$59,935	\$262,727	\$92,132	\$4,345	\$112	\$466	\$0	\$41	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$830,902	
2035	\$406,941	\$61,533	\$269,735	\$93,621	\$4,371	\$113	\$469	\$0	\$41	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$859,646	
2036	\$417,014	\$63,057	\$276,412	\$96,062	\$4,397	\$113	\$472	\$0	\$42	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$881,089	
2037	\$427,439	\$64,633	\$283,322	\$100,565	\$4,423	\$114	\$478	\$0	\$42	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$903,256	
2038	\$438,227	\$66,264	\$290,473	\$103,130	\$4,449	\$115	\$481	\$0	\$42	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$926,175	
2039	\$449,394	\$67,953	\$297,875	\$105,762	\$4,475	\$115	\$481	\$0	\$42	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,099,136	
2040	\$460,953	\$71,510	\$305,537	\$108,461	\$4,502	\$116	\$484	\$0	\$42	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$974,376	
2041	\$472,918	\$75,064	\$313,468	\$111,229	\$4,528	\$117	\$487	\$0	\$43	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,193,549	
2042	\$485,305	\$77,383	\$321,678	\$114,002	\$4,555	\$118	\$490	\$0	\$43	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,032,485	
2043	\$498,129	\$79,322	\$330,178	\$122,544	\$4,581	\$118	\$493	\$0	\$43	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,058,890	
2044	\$511,406	\$81,501	\$338,379	\$125,632	\$4,608	\$119	\$496	\$0	\$44	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,086,219	
2045	\$525,153	\$83,466	\$346,091	\$128,192	\$4,634	\$120	\$499	\$0	\$44	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,126,046	
2046	\$539,388	\$85,561	\$353,527	\$130,627	\$4,661	\$121	\$502	\$0	\$44	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,143,791	
2047	\$554,129	\$87,790	\$367,297	\$133,139	\$4,688	\$121	\$505	\$0	\$44	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,174,106	
2048	\$569,395	\$89,998	\$377,416	\$135,730	\$4,715	\$122	\$508	\$0	\$45	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,257,175	
2049	\$585,204	\$92,355	\$387,895	\$138,338	\$4,742	\$122	\$511	\$0	\$45	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,257,175	
2050	\$601,577	\$94,964	\$398,747	\$141,165	\$4,769	\$123	\$514	\$0	\$45	\$77	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,237,962	

Scenario 2

ALEDO TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Treatment	Storage/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$286,229	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$266,229
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$32,016	\$0	\$0	\$8,275	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$28,795	\$34,320	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$101,407
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$124,818	\$464,966	\$841,804	\$1,309,461	\$172,061	\$2,799	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16,735	\$13,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,745,644
2006	\$50,618	\$1,310	\$14,261	\$10,664	\$2,540	\$66	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$79,979
2007	\$50,968	\$1,591	\$13,745	\$9,838	\$2,448	\$63	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$79,163
2008	\$51,493	\$1,873	\$13,293	\$9,234	\$2,368	\$61	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76,843
2009	\$52,198	\$2,157	\$12,894	\$8,771	\$2,297	\$59	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76,897
2010	\$53,153	\$2,450	\$12,559	\$8,401	\$2,237	\$56	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76,378
2011	\$177,107	\$8,216	\$864,732	\$708,420	\$2,187	\$55	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,761,239
2012	\$55,568	\$8,402	\$36,831	\$18,922	\$2,138	\$55	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$122,434
2013	\$56,975	\$8,615	\$37,765	\$18,679	\$2,095	\$54	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$124,704
2014	\$58,560	\$8,855	\$38,816	\$18,487	\$2,058	\$53	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$127,349
2015	\$78,082	\$11,504	\$50,430	\$21,034	\$2,025	\$3,394	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$164,990
2016	\$81,423	\$12,312	\$53,870	\$20,925	\$2,005	\$52	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$166,297
2017	\$84,208	\$12,733	\$55,814	\$20,851	\$1,985	\$51	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$171,122
2018	\$87,064	\$13,165	\$57,710	\$20,776	\$1,964	\$51	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$173,082
2019	\$89,905	\$13,487	\$59,503	\$20,700	\$1,942	\$50	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$184,861
2020	\$92,720	\$13,810	\$61,293	\$20,624	\$1,920	\$50	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$201,622
2021	\$95,569	\$14,148	\$63,083	\$20,548	\$1,898	\$49	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$213,912
2022	\$102,297	\$14,871	\$67,806	\$25,569	\$1,880	\$48	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$220,429
2023	\$105,673	\$15,979	\$70,044	\$26,307	\$1,859	\$48	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$227,200
2024	\$109,139	\$16,503	\$72,341	\$26,813	\$1,837	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$234,343
2025	\$127,260	\$19,243	\$84,353	\$653,070	\$1,814	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$242,429
2026	\$131,689	\$19,913	\$87,288	\$33,960	\$1,798	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$249,566
2027	\$136,233	\$20,600	\$90,300	\$34,961	\$1,782	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$256,703
2028	\$140,895	\$21,305	\$93,390	\$35,970	\$1,764	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$263,840
2029	\$145,604	\$21,548	\$96,457	\$36,473	\$1,746	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$270,977
2030	\$148,888	\$21,757	\$98,375	\$36,872	\$1,725	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$278,114
2031	\$286,386	\$21,940	\$98,656	\$36,796	\$1,701	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$285,251
2032	\$147,701	\$22,334	\$97,902	\$40,623	\$1,694	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$292,388
2033	\$150,220	\$22,715	\$99,571	\$40,887	\$1,685	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$299,525
2034	\$152,814	\$23,077	\$101,158	\$40,639	\$1,673	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$306,662
2035	\$154,470	\$23,357	\$102,368	\$40,418	\$1,659	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$313,800
2036	\$155,893	\$23,573	\$103,332	\$40,087	\$1,644	\$42	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$320,937
2037	\$157,353	\$23,793	\$104,299	\$39,758	\$1,628	\$42	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$328,074
2038	\$158,848	\$24,019	\$105,291	\$39,432	\$1,613	\$41	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$335,211
2039	\$160,382	\$24,251	\$106,307	\$39,108	\$1,597	\$41	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$342,348
2040	\$161,963	\$24,482	\$107,348	\$38,787	\$1,582	\$41	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$349,485
2041	\$163,582	\$24,712	\$108,415	\$38,469	\$1,566	\$40	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$356,622
2042	\$165,209	\$24,961	\$109,507	\$44,240	\$1,550	\$40	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$363,759
2043	\$166,895	\$25,236	\$110,624	\$41,393	\$1,535	\$40	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$370,896
2044	\$168,621	\$25,497	\$111,768	\$41,489	\$1,519	\$39	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$378,033
2045	\$170,388	\$25,764	\$112,938	\$41,592	\$1,504	\$39	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$385,170
2046	\$172,192	\$26,037	\$114,135	\$41,701	\$1,488	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$392,307
2047	\$174,038	\$26,316	\$115,359	\$41,815	\$1,472	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$399,444
2048	\$175,925	\$26,602	\$116,609	\$41,936	\$1,457	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$406,581
2049	\$177,853	\$26,892	\$117,888	\$42,063	\$1,441	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$413,718
2050	\$179,823	\$27,191	\$119,193	\$42,197	\$1,426	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$520	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$420,855

Scenario 2

HUDSON OAKS TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Treatment	Storage/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$370,170	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$370,170
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$48,790	\$0	\$0	\$9,563	\$26,156	\$0	\$2,245	\$0	\$195,756	\$0	\$109,890	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$392,400
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$201,429	\$750,354	\$1,035,733	\$1,482,576	\$277,669	\$4,517	\$16,460	\$0	\$1,423	\$0	\$73,924	\$0	\$41,625	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,885,710
2006	\$85,078	\$2,202	\$23,969	\$13,167	\$4,270	\$110	\$405	\$0	\$35	\$0	\$2,954	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$133,865
2007	\$89,010	\$2,779	\$24,008	\$13,008	\$4,276	\$110	\$408	\$0	\$35	\$0	\$2,953	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$138,253
2008	\$93,315	\$3,394	\$24,090	\$12,921	\$4,291	\$111	\$412	\$0	\$36	\$0	\$2,952	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$143,166
2009	\$98,002	\$4,050	\$24,208	\$12,881	\$4,312	\$111	\$416	\$0	\$36	\$0	\$2,952	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$148,634
2010	\$102,646	\$4,732	\$24,254	\$12,874	\$4,320	\$111	\$419	\$0	\$37	\$0	\$2,951	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$154,009
2011	\$109,660	\$5,220	\$24,235	\$12,791	\$4,318	\$111	\$421	\$0	\$37	\$0	\$2,948	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,210,531
2012	\$112,009	\$5,937	\$24,244	\$12,785	\$4,310	\$111	\$424	\$0	\$37	\$0	\$2,942	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$243,943
2013	\$116,751	\$7,654	\$27,387	\$32,032	\$4,294	\$111	\$426	\$0	\$37	\$0	\$2,934	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$253,290
2014	\$121,502	\$18,372	\$80,536	\$32,902	\$4,269	\$110	\$427	\$0	\$37	\$0	\$2,927	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$282,747
2015	\$159,246	\$24,079	\$105,564	\$38,850	\$4,238	\$103	\$428	\$0	\$38	\$0	\$119,666	\$0	\$1,665	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$460,866
2016	\$165,831	\$25,075	\$109,919	\$40,109	\$4,224	\$109	\$428	\$0	\$38	\$0	\$2,920	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$416,918
2017	\$172,462	\$25,078	\$114,314	\$41,498	\$4,204	\$108	\$428	\$0	\$38	\$0	\$2,920	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$436,247
2018	\$178,134	\$27,087	\$117,737	\$41,172	\$4,178	\$108	\$426	\$0	\$38	\$0	\$2,919	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$456,912
2019	\$185,838	\$28,100	\$123,180	\$42,301	\$4,145	\$107	\$426	\$0	\$37	\$0	\$2,916	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$476,247
2020	\$204,988	\$30,983	\$135,880	\$52,835	\$4,107	\$106	\$424	\$0	\$37	\$0	\$2,913	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$496,912
2021	\$440,596	\$32,070	\$1,982,988	\$57,474	\$4,070	\$105	\$422	\$0	\$37	\$0	\$2,910	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,222,343
2022	\$219,177	\$33,142	\$145,279	\$66,929	\$4,027	\$104	\$420	\$0	\$37	\$0	\$2,905	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$465,669
2023	\$226,197	\$34,203	\$149,931	\$80,204	\$3,978	\$103	\$417	\$0	\$36	\$0	\$2,899	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$479,639
2024	\$233,115	\$35,249	\$154,517	\$81,297	\$3,923	\$101	\$413	\$0	\$36	\$0	\$2,895	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$493,216
2025	\$270,888	\$40,961	\$179,555	\$148,955	\$3,861	\$100	\$409	\$0	\$36	\$0	\$2,885	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,982,322
2026	\$278,960	\$42,182	\$184,905	\$167,167	\$3,809	\$98	\$404	\$0	\$35	\$0	\$2,876	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$591,111
2027	\$286,748	\$43,359	\$190,067	\$177,299	\$3,683	\$95	\$398	\$0	\$35	\$0	\$2,868	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$974,043
2028	\$294,168	\$44,481	\$194,988	\$187,167	\$3,683	\$95	\$392	\$0	\$34	\$0	\$2,854	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$620,537
2029	\$294,564	\$44,541	\$195,248	\$187,114	\$3,608	\$93	\$384	\$0	\$34	\$0	\$2,843	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$620,826
2030	\$294,884	\$44,589	\$195,460	\$187,114	\$3,534	\$91	\$377	\$0	\$33	\$0	\$2,831	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$620,581
2031	\$586,806	\$46,647	\$1,989,638	\$1,085,982	\$3,462	\$89	\$370	\$0	\$33	\$0	\$2,825	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,725,522
2032	\$299,010	\$45,213	\$198,195	\$82,809	\$3,439	\$88	\$367	\$0	\$32	\$0	\$2,819	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$653,634
2033	\$302,886	\$45,789	\$200,794	\$82,273	\$3,387	\$88	\$364	\$0	\$32	\$0	\$2,814	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$640,687
2034	\$306,901	\$46,406	\$203,425	\$81,777	\$3,365	\$87	\$361	\$0	\$31	\$0	\$2,808	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$646,833
2035	\$310,339	\$46,926	\$205,704	\$81,202	\$3,333	\$86	\$357	\$0	\$31	\$0	\$2,800	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$652,452
2036	\$313,198	\$47,359	\$207,589	\$80,536	\$3,302	\$85	\$354	\$0	\$31	\$0	\$2,796	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$658,932
2037	\$316,130	\$47,802	\$209,543	\$79,876	\$3,271	\$84	\$351	\$0	\$31	\$0	\$2,791	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$665,550
2038	\$318,136	\$48,257	\$211,535	\$79,220	\$3,240	\$84	\$348	\$0	\$31	\$0	\$1,367,711	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$900,226
2039	\$322,217	\$48,727	\$213,577	\$78,570	\$3,209	\$83	\$345	\$0	\$30	\$0	\$2,784	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$671,202
2040	\$325,373	\$49,200	\$215,669	\$77,926	\$3,178	\$82	\$341	\$0	\$30	\$0	\$2,777	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$681,601
2041	\$328,605	\$49,688	\$217,811	\$77,287	\$3,146	\$81	\$338	\$0	\$29	\$0	\$2,771	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$691,423
2042	\$331,914	\$50,189	\$220,005	\$84,513	\$3,115	\$80	\$335	\$0	\$29	\$0	\$2,765	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,504,610
2043	\$335,302	\$50,701	\$222,251	\$83,160	\$3,084	\$80	\$332	\$0	\$29	\$0	\$2,759	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$699,361
2044	\$338,769	\$51,225	\$224,548	\$83,355	\$3,052	\$79	\$328	\$0	\$29	\$0	\$2,754	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$705,801
2045	\$342,315	\$51,761	\$226,898	\$83,561	\$3,021	\$78	\$325	\$0	\$28	\$0	\$2,748	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$712,988
2046	\$345,943	\$52,310	\$229,304	\$83,779	\$2,990	\$78	\$322	\$0	\$28	\$0	\$2,742	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$720,555
2047	\$349,651	\$52,871	\$231,762	\$84,009	\$2,958	\$76	\$319	\$0	\$28	\$0	\$2,737	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$728,069
2048	\$353,442	\$53,444	\$234,275	\$84,252	\$2,927	\$75	\$315	\$0	\$28	\$0	\$2,730	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$735,146
2049	\$357,317	\$54,042	\$236,843	\$84,502	\$2,895	\$75	\$312	\$0	\$27	\$0	\$2,724	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,382,630
2050	\$361,275	\$54,628	\$239,468	\$84,776	\$2,864	\$74	\$309	\$0	\$27	\$0	\$2,718	\$0	\$88,265	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$747,782

Scenario 2

ANNETTA NORTH TOTAL COSTS
(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/Pumping	Treatment	Storage/Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$0	\$29,887	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$29,887
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$4,548	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$19,451	\$72,460	\$100,018	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2006	\$8,294	\$245	\$2,337	\$385	\$416	\$11	\$38	\$0	\$3	\$0	\$288	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$228,045
2007	\$8,728	\$273	\$2,355	\$647	\$419	\$11	\$40	\$0	\$3	\$0	\$280	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$11,988
2008	\$8,181	\$334	\$2,370	\$858	\$422	\$11	\$41	\$0	\$4	\$0	\$290	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,767
2009	\$9,649	\$399	\$2,384	\$985	\$425	\$11	\$41	\$0	\$4	\$0	\$291	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$13,490
2010	\$10,156	\$468	\$2,400	\$1,101	\$427	\$11	\$41	\$0	\$4	\$0	\$292	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,187
2011	\$34,887	\$1,618	\$10,338	\$10,849	\$431	\$11	\$42	\$0	\$4	\$0	\$294	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,901
2012	\$11,459	\$1,733	\$7,595	\$3,210	\$441	\$11	\$43	\$0	\$4	\$0	\$301	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,273
2013	\$12,259	\$1,854	\$8,126	\$3,565	\$451	\$12	\$43	\$0	\$4	\$0	\$308	\$81,015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$24,788
2014	\$13,108	\$1,992	\$8,688	\$3,909	\$461	\$12	\$46	\$0	\$4	\$0	\$316	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$107,838
2015	\$13,668	\$2,672	\$11,711	\$4,965	\$470	\$788	\$47	\$0	\$4	\$13,277	\$30,687	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$28,525
2016	\$18,313	\$2,769	\$12,139	\$4,843	\$466	\$12	\$47	\$0	\$4	\$0	\$322	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$82,189
2017	\$19,018	\$2,876	\$12,606	\$4,832	\$464	\$12	\$47	\$0	\$4	\$0	\$322	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$40,144
2018	\$19,786	\$2,992	\$13,115	\$5,661	\$461	\$12	\$3,068	\$0	\$271	\$0	\$323	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$41,408
2019	\$20,621	\$3,118	\$13,668	\$5,661	\$460	\$12	\$47	\$0	\$4	\$0	\$324	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$172,851
2020	\$22,914	\$3,465	\$15,188	\$5,881	\$459	\$12	\$47	\$0	\$4	\$0	\$326	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$45,144
2021	\$49,763	\$3,622	\$190,084	\$5,938	\$460	\$12	\$48	\$0	\$4	\$0	\$329	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$251,487
2022	\$25,079	\$3,792	\$16,623	\$6,017	\$461	\$12	\$48	\$0	\$4	\$0	\$333	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$53,698
2023	\$26,284	\$3,976	\$17,429	\$6,118	\$462	\$12	\$48	\$0	\$4	\$0	\$338	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$55,910
2024	\$27,607	\$4,174	\$18,299	\$6,240	\$465	\$12	\$49	\$0	\$4	\$0	\$343	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$58,421
2025	\$32,776	\$4,956	\$21,725	\$152,084	\$467	\$12	\$49	\$0	\$4	\$0	\$350	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,651
2026	\$34,585	\$5,230	\$22,924	\$7,929	\$472	\$12	\$50	\$0	\$4	\$0	\$358	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$123,651
2027	\$36,539	\$5,525	\$24,220	\$8,215	\$463	\$12	\$50	\$0	\$4	\$0	\$366	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$172,793
2028	\$38,651	\$5,844	\$25,619	\$8,538	\$484	\$12	\$51	\$0	\$5	\$0	\$377	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$173,500
2029	\$40,044	\$6,055	\$26,542	\$8,771	\$490	\$13	\$52	\$0	\$5	\$0	\$388	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$80,908
2030	\$41,478	\$6,272	\$27,493	\$9,014	\$497	\$13	\$53	\$0	\$5	\$0	\$400	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$83,588
2031	\$65,404	\$6,498	\$291,027	\$131,355	\$504	\$13	\$54	\$0	\$5	\$0	\$412	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$86,453
2032	\$44,184	\$6,661	\$29,287	\$10,364	\$507	\$13	\$54	\$0	\$5	\$0	\$417	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$516,499
2033	\$45,445	\$6,872	\$30,123	\$10,654	\$510	\$13	\$55	\$0	\$5	\$0	\$423	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$92,738
2034	\$46,761	\$7,071	\$30,995	\$10,957	\$513	\$13	\$55	\$0	\$5	\$0	\$429	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$95,326
2035	\$48,021	\$7,261	\$31,830	\$11,258	\$518	\$13	\$55	\$0	\$5	\$0	\$435	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$98,025
2036	\$49,224	\$7,443	\$32,627	\$11,553	\$519	\$13	\$56	\$0	\$5	\$0	\$440	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$100,822
2037	\$50,469	\$7,631	\$33,452	\$11,856	\$522	\$13	\$56	\$0	\$5	\$0	\$446	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,108
2038	\$51,757	\$7,826	\$34,307	\$12,166	\$525	\$14	\$56	\$0	\$5	\$0	\$22,172	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$105,679
2039	\$53,092	\$8,028	\$35,191	\$12,485	\$529	\$14	\$57	\$0	\$5	\$0	\$469	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$130,058
2040	\$54,473	\$8,235	\$36,107	\$12,813	\$532	\$14	\$57	\$0	\$5	\$0	\$465	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$111,086
2041	\$55,904	\$8,453	\$37,055	\$13,148	\$535	\$14	\$58	\$0	\$5	\$0	\$471	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$131,569
2042	\$57,386	\$8,677	\$38,037	\$13,486	\$539	\$14	\$58	\$0	\$5	\$0	\$478	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$116,871
2043	\$58,920	\$8,909	\$39,054	\$13,827	\$542	\$14	\$58	\$0	\$5	\$0	\$485	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$123,076
2044	\$60,509	\$9,150	\$40,108	\$14,186	\$545	\$14	\$59	\$0	\$5	\$0	\$491	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$126,927
2045	\$62,155	\$9,398	\$41,199	\$15,172	\$549	\$14	\$59	\$0	\$5	\$0	\$498	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$130,278
2046	\$63,860	\$9,656	\$42,329	\$15,465	\$552	\$13	\$59	\$0	\$5	\$0	\$505	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$135,041
2047	\$65,627	\$9,923	\$43,500	\$15,768	\$555	\$14	\$60	\$0	\$5	\$0	\$512	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$137,182
2048	\$67,456	\$10,200	\$44,713	\$16,080	\$559	\$14	\$60	\$0	\$5	\$0	\$520	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$140,835
2049	\$69,352	\$90,346	\$45,969	\$56,332	\$562	\$14	\$60	\$0	\$5	\$0	\$527	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$268,242
2050	\$71,316	\$10,784	\$47,271	\$56,735	\$565	\$15	\$61	\$0	\$5	\$0	\$535	\$1,227	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$148,514

Scenario 2

ANNETTA TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Treatment	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$75,790
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$24,169
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$49,326	\$183,747	\$253,631	\$0	\$67,996	\$1,106	\$0	\$0	\$0	\$0	\$0	\$0	\$6,613	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$562,420
2006	\$21,032	\$544	\$5,925	\$976	\$1,055	\$27	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$29,560
2007	\$22,136	\$691	\$5,971	\$1,640	\$1,064	\$27	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$31,530
2008	\$23,281	\$847	\$6,010	\$2,125	\$1,071	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$33,361
2009	\$24,469	\$1,011	\$6,044	\$2,497	\$1,077	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$35,126
2010	\$25,765	\$1,167	\$6,086	\$2,792	\$1,084	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$36,951
2011	\$66,488	\$4,104	\$431,951	\$265,373	\$1,052	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$791,016
2012	\$29,058	\$4,394	\$19,261	\$8,140	\$1,118	\$29	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$82,000
2013	\$31,087	\$4,701	\$20,606	\$9,041	\$1,143	\$29	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$82,884
2014	\$33,239	\$5,026	\$22,032	\$9,911	\$1,168	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$71,406
2015	\$44,803	\$6,775	\$29,697	\$12,338	\$1,192	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$190,812
2016	\$46,439	\$7,292	\$30,781	\$12,282	\$1,183	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$100,548
2017	\$48,227	\$7,292	\$31,967	\$12,252	\$1,176	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,752
2018	\$50,175	\$7,597	\$33,258	\$33,707	\$1,170	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$135,426
2019	\$52,292	\$7,907	\$34,661	\$14,356	\$1,166	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$428,731
2020	\$58,106	\$8,768	\$38,515	\$14,912	\$1,164	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$113,214
2021	\$58,191	\$9,185	\$42,025	\$15,058	\$1,166	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$124,313
2022	\$63,597	\$9,617	\$42,155	\$15,259	\$1,169	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$66,452
2023	\$66,679	\$10,062	\$44,197	\$15,514	\$1,173	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$134,621
2024	\$70,008	\$10,598	\$46,404	\$15,824	\$1,178	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$140,469
2025	\$83,114	\$12,588	\$55,091	\$38,661	\$1,185	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$146,820
2026	\$87,703	\$13,262	\$58,133	\$20,108	\$1,198	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$540,440
2027	\$92,668	\$14,011	\$61,417	\$20,833	\$1,174	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$183,224
2028	\$98,014	\$14,821	\$64,967	\$21,646	\$1,227	\$32	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$321,586
2029	\$101,545	\$15,355	\$67,308	\$22,242	\$1,244	\$32	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$203,498
2030	\$105,182	\$15,905	\$69,719	\$22,859	\$1,261	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$210,516
2031	\$216,571	\$16,478	\$73,002	\$33,096	\$1,278	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$217,750
2032	\$112,043	\$16,942	\$74,266	\$26,281	\$1,285	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,308,250
2033	\$115,242	\$17,426	\$76,387	\$27,017	\$1,292	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$233,842
2034	\$116,578	\$17,930	\$78,598	\$27,766	\$1,300	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$240,190
2035	\$121,775	\$18,414	\$80,717	\$28,548	\$1,308	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$247,018
2036	\$124,824	\$18,875	\$82,736	\$29,296	\$1,316	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$253,598
2037	\$127,981	\$19,352	\$84,830	\$30,064	\$1,324	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$259,876
2038	\$131,249	\$19,848	\$86,997	\$30,852	\$1,332	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$266,376
2039	\$134,632	\$20,358	\$89,239	\$31,661	\$1,341	\$35	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$273,104
2040	\$138,136	\$65,618	\$91,562	\$32,491	\$1,349	\$35	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$280,059
2041	\$141,764	\$21,436	\$93,966	\$33,343	\$1,357	\$35	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$331,984
2042	\$145,521	\$22,004	\$96,457	\$34,218	\$1,366	\$35	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$302,488
2043	\$149,412	\$22,593	\$98,036	\$35,057	\$1,374	\$36	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$660,358
2044	\$153,442	\$23,202	\$101,707	\$37,755	\$1,383	\$36	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$312,301
2045	\$157,616	\$23,833	\$104,474	\$38,475	\$1,391	\$36	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$320,319
2046	\$161,940	\$24,487	\$107,340	\$39,218	\$1,399	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$328,620
2047	\$166,419	\$25,184	\$110,309	\$39,985	\$1,408	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$340,681
2048	\$171,059	\$25,866	\$113,395	\$40,776	\$1,417	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$346,117
2049	\$175,867	\$26,614	\$116,571	\$41,623	\$1,425	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$355,335
2050	\$180,847	\$27,346	\$119,872	\$42,849	\$1,434	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$668,649
																							\$374,769

Scenario 2

ANNETTA SOUTH TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Treatment	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$47,707	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$47,707
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$0	\$0	\$1,423	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,530	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$15,213
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,163	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$354,023
2005	\$13,049	\$115,662	\$159,652	\$0	\$42,801	\$696	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,607
2006	\$13,239	\$343	\$3,730	\$614	\$664	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,847
2007	\$13,934	\$435	\$3,758	\$1,033	\$669	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20,989
2008	\$14,654	\$533	\$3,783	\$1,338	\$674	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$22,111
2009	\$15,403	\$637	\$3,805	\$1,572	\$678	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$23,247
2010	\$16,212	\$747	\$3,831	\$1,757	\$682	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$497,917
2011	\$55,688	\$2,583	\$271,696	\$167,043	\$688	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$39,027
2012	\$18,281	\$2,766	\$12,124	\$5,124	\$704	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$179,715
2013	\$19,568	\$2,959	\$12,371	\$5,691	\$720	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$44,948
2014	\$20,923	\$3,164	\$13,868	\$6,239	\$735	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$132,338
2015	\$28,202	\$4,264	\$18,693	\$7,766	\$750	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$63,573
2016	\$29,232	\$4,420	\$19,376	\$7,731	\$745	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$66,578
2017	\$30,357	\$4,590	\$20,122	\$7,712	\$740	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$270,131
2018	\$31,583	\$4,776	\$20,935	\$7,637	\$737	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$71,515
2019	\$32,916	\$4,977	\$21,918	\$7,534	\$734	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$78,493
2020	\$36,576	\$5,531	\$24,244	\$7,387	\$733	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$400,860
2021	\$78,433	\$5,782	\$30,347	\$7,479	\$734	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$84,989
2022	\$40,002	\$6,053	\$26,535	\$9,605	\$736	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$92,638
2023	\$41,972	\$6,347	\$27,821	\$9,766	\$738	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$340,403
2024	\$44,067	\$6,663	\$29,209	\$9,960	\$742	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$115,500
2025	\$52,318	\$7,911	\$34,678	\$24,270	\$746	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$202,645
2026	\$55,206	\$8,348	\$36,593	\$12,657	\$754	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$132,733
2027	\$58,325	\$8,819	\$38,660	\$13,113	\$754	\$19	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$137,288
2028	\$61,696	\$9,329	\$40,894	\$13,626	\$772	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$823,720
2029	\$63,919	\$9,865	\$42,968	\$14,000	\$783	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$147,293
2030	\$68,208	\$10,011	\$43,985	\$14,389	\$794	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$151,415
2031	\$68,324	\$10,372	\$46,546	\$209,672	\$804	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$190,634
2032	\$70,527	\$10,664	\$46,748	\$16,543	\$809	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$209,201
2033	\$72,541	\$10,969	\$48,083	\$17,006	\$813	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$176,515
2034	\$74,641	\$11,286	\$49,475	\$17,490	\$818	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$209,201
2035	\$76,653	\$11,591	\$50,808	\$17,970	\$823	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$190,634
2036	\$78,572	\$11,881	\$52,081	\$18,441	\$828	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$172,137
2037	\$80,559	\$12,181	\$53,398	\$18,924	\$834	\$21	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$167,803
2038	\$82,616	\$12,492	\$54,761	\$19,420	\$839	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$176,515
2039	\$84,746	\$12,814	\$56,173	\$19,929	\$844	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$209,201
2040	\$86,952	\$41,304	\$57,635	\$20,452	\$849	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$190,634
2041	\$89,235	\$13,693	\$59,148	\$20,988	\$854	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$415,902
2042	\$91,600	\$15,051	\$60,718	\$21,484	\$860	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$190,634
2043	\$94,050	\$14,221	\$62,340	\$23,326	\$865	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$415,902
2044	\$96,598	\$14,905	\$64,021	\$23,765	\$870	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$198,813
2045	\$99,214	\$15,002	\$65,763	\$24,219	\$876	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$201,860
2046	\$101,938	\$15,414	\$67,567	\$24,686	\$881	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$207,086
2047	\$104,755	\$15,640	\$69,435	\$25,169	\$886	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$214,678
2048	\$107,676	\$16,282	\$71,372	\$25,687	\$892	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$216,101
2049	\$110,702	\$144,213	\$73,377	\$89,919	\$897	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$223,904
2050	\$113,837	\$17,213	\$75,455	\$26,713	\$902	\$23	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$421,125
																							\$236,139

Scenario 2

FORT WORTH NORTH ETJ TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Treatment	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$2,117	\$0	\$415	\$1,135	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,668
2004	\$0	\$0	\$0	\$0	\$264	\$963	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,337,743
2005	\$11,784	\$43,898	\$60,591	\$0	\$16,244	\$272	\$7	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,384
2006	\$5,414	\$140	\$1,525	\$0	\$272	\$7	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,155
2007	\$6,019	\$188	\$1,824	\$0	\$289	\$7	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,567
2008	\$6,596	\$240	\$1,703	\$0	\$303	\$8	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,249
2009	\$7,151	\$298	\$1,787	\$0	\$315	\$8	\$30	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$11,824
2010	\$7,708	\$355	\$1,821	\$0	\$324	\$9	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,490
2011	\$26,859	\$1,231	\$13,650	\$22,178	\$353	\$9	\$32	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,392
2012	\$6,976	\$1,357	\$5,950	\$1,152	\$345	\$9	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,824
2013	\$9,899	\$1,467	\$6,429	\$1,660	\$357	\$9	\$35	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$19,656
2014	\$10,444	\$1,579	\$6,923	\$2,131	\$367	\$9	\$37	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$21,490
2015	\$14,143	\$2,139	\$9,375	\$2,947	\$631	\$38	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$28,649
2016	\$15,202	\$2,299	\$10,076	\$3,423	\$376	\$10	\$39	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$31,436
2017	\$16,307	\$2,466	\$10,809	\$3,872	\$387	\$10	\$40	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$33,902
2018	\$17,464	\$2,641	\$11,576	\$4,077	\$407	\$11	\$43	\$433,125	\$40	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$56,095
2019	\$18,678	\$2,824	\$12,381	\$5,512	\$417	\$11	\$43	\$164,062	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$58,868
2020	\$21,240	\$3,212	\$14,079	\$6,184	\$426	\$11	\$44	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$62,562
2021	\$45,094	\$3,282	\$17,250	\$6,105	\$417	\$11	\$43	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$64,334
2022	\$22,217	\$3,358	\$14,226	\$6,048	\$408	\$11	\$43	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$65,032
2023	\$22,771	\$3,443	\$15,093	\$6,011	\$400	\$10	\$41	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$69,004
2024	\$23,372	\$3,534	\$15,492	\$5,993	\$393	\$10	\$41	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$69,849
2025	\$27,125	\$4,102	\$17,990	\$142,798	\$387	\$10	\$40	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2026	\$27,981	\$4,231	\$18,547	\$7,278	\$382	\$10	\$40	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2027	\$28,899	\$4,370	\$19,155	\$7,372	\$387	\$10	\$40	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2028	\$29,884	\$4,519	\$19,808	\$7,488	\$374	\$10	\$39	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2029	\$30,266	\$4,577	\$20,062	\$7,521	\$371	\$10	\$39	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2030	\$30,648	\$4,634	\$20,314	\$7,557	\$367	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2031	\$61,689	\$4,694	\$20,214	\$107,645	\$364	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2032	\$31,607	\$4,779	\$20,950	\$8,303	\$362	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2033	\$32,194	\$4,868	\$21,359	\$8,344	\$361	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2034	\$32,802	\$4,960	\$21,742	\$8,389	\$360	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2035	\$33,353	\$5,043	\$22,108	\$8,426	\$358	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2036	\$33,848	\$5,118	\$22,436	\$8,453	\$357	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2037	\$34,355	\$5,195	\$22,772	\$8,480	\$355	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2038	\$34,878	\$5,274	\$23,117	\$8,507	\$354	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2039	\$35,409	\$5,354	\$23,471	\$8,534	\$353	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2040	\$35,957	\$5,434	\$23,833	\$8,561	\$351	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2041	\$36,516	\$5,522	\$24,205	\$8,589	\$350	\$9	\$38	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2042	\$37,083	\$5,609	\$24,587	\$8,617	\$348	\$9	\$37	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2043	\$37,683	\$5,698	\$24,978	\$8,646	\$347	\$9	\$37	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2044	\$38,288	\$5,790	\$25,379	\$8,675	\$345	\$9	\$37	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2045	\$38,943	\$5,883	\$25,790	\$8,704	\$343	\$9	\$37	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2046	\$39,543	\$5,979	\$26,211	\$8,733	\$342	\$9	\$37	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2047	\$40,184	\$6,078	\$26,642	\$8,762	\$340	\$9	\$37	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2048	\$40,862	\$6,179	\$27,085	\$8,790	\$338	\$9	\$36	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2049	\$41,545	\$6,282	\$27,538	\$8,818	\$337	\$9	\$36	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849
2050	\$42,245	\$6,388	\$28,002	\$8,846	\$335	\$9	\$36	\$6,562	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103,849

FORT WORTH SOUTH ETJ TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Water Intake/ Pumping	Raw Water Treatment	Storage/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$5,141	\$19,151	\$26,435	\$0	\$7,087	\$115	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,936
2006	\$2,362	\$61	\$665	\$0	\$119	\$3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$58,618
2007	\$2,626	\$82	\$708	\$0	\$126	\$3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,210
2008	\$2,877	\$105	\$743	\$0	\$132	\$3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,861
2009	\$3,120	\$129	\$771	\$0	\$137	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,160
2010	\$3,363	\$155	\$795	\$0	\$142	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,458
2011	\$11,762	\$546	\$7,427	\$8,676	\$145	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,761
2012	\$13,916	\$592	\$2,596	\$503	\$151	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,593
2013	\$4,232	\$640	\$2,805	\$724	\$158	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,761
2014	\$4,557	\$689	\$3,020	\$930	\$160	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,593
2015	\$6,170	\$933	\$4,090	\$1,286	\$164	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,360
2016	\$6,632	\$1,003	\$4,396	\$1,493	\$169	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16,520
2017	\$7,114	\$1,076	\$4,716	\$1,689	\$173	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$13,786
2018	\$7,618	\$1,152	\$5,050	\$1,115	\$178	\$5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$14,860
2019	\$8,149	\$1,232	\$5,401	\$2,405	\$182	\$5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16,520
2020	\$9,267	\$1,401	\$6,142	\$2,668	\$186	\$5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2021	\$9,693	\$1,466	\$6,425	\$2,639	\$182	\$5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2022	\$9,984	\$1,502	\$6,585	\$2,622	\$178	\$5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2023	\$10,196	\$1,542	\$6,759	\$2,615	\$172	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2024	\$11,834	\$1,768	\$7,844	\$2,299	\$169	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2025	\$12,207	\$1,846	\$8,091	\$3,175	\$167	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2026	\$12,608	\$1,906	\$8,357	\$3,216	\$169	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2027	\$13,038	\$1,971	\$8,642	\$3,257	\$163	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2028	\$13,204	\$1,997	\$8,752	\$3,281	\$162	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2029	\$13,371	\$2,022	\$8,863	\$3,287	\$160	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2030	\$13,789	\$2,048	\$9,140	\$4,963	\$158	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2031	\$14,045	\$2,124	\$9,310	\$3,640	\$158	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2032	\$14,311	\$2,164	\$9,486	\$3,660	\$157	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2033	\$14,551	\$2,200	\$9,645	\$3,676	\$156	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2034	\$14,767	\$2,233	\$9,788	\$3,688	\$156	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2035	\$14,988	\$2,268	\$9,935	\$3,699	\$155	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2036	\$15,215	\$2,301	\$10,085	\$3,711	\$154	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2037	\$15,446	\$2,336	\$10,240	\$3,723	\$154	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2038	\$15,687	\$2,409	\$10,398	\$3,735	\$153	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2039	\$15,932	\$2,499	\$10,560	\$3,747	\$153	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2040	\$16,183	\$2,486	\$10,727	\$4,613	\$152	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2041	\$16,440	\$2,466	\$10,887	\$4,077	\$151	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2042	\$16,704	\$2,526	\$11,072	\$4,110	\$151	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2043	\$16,975	\$2,587	\$11,251	\$4,144	\$150	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2044	\$17,252	\$2,609	\$11,435	\$4,178	\$149	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2045	\$17,536	\$2,652	\$11,623	\$4,213	\$148	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2046	\$17,827	\$2,696	\$11,816	\$4,249	\$148	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2047	\$18,125	\$2,696	\$11,816	\$4,249	\$148	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2048	\$18,431	\$2,787	\$12,014	\$4,325	\$147	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2049	\$18,431	\$2,787	\$12,014	\$4,325	\$146	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865
2050	\$18,431	\$2,787	\$12,014	\$4,325	\$146	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,865

UNINCORPORATED PARKER COUNTY ON NON-MUNICIPAL WATER SYSTEMS TOTAL COSTS

(All cost amounts shown are in current Dollars)

Year	Raw Water Purchase	Raw Water Intake/ Pumping	Storage/ Treatment/ Pumping	Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12	Pipe 13	Pipe 14	Pipe 15	Pipe 16	Pipe 17	Pipe 18	Total	
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2006	\$3,346	\$87	\$943	\$0	\$168	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,547
2007	\$6,429	\$201	\$1,734	\$0	\$309	\$8	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,881
2008	\$9,322	\$339	\$2,406	\$0	\$429	\$11	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,507
2009	\$12,078	\$489	\$3,983	\$0	\$531	\$14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16,106
2010	\$14,767	\$681	\$3,488	\$0	\$622	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$19,574
2011	\$56,814	\$2,636	\$277,396	\$0	\$702	\$18	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$337,568
2012	\$20,400	\$3,085	\$13,522	\$0	\$785	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$37,812
2013	\$23,452	\$3,546	\$15,545	\$0	\$862	\$22	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76,862
2014	\$26,605	\$4,023	\$17,635	\$0	\$935	\$24	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$48,221
2015	\$37,682	\$5,698	\$24,977	\$0	\$1,003	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$93,033
2016	\$42,129	\$6,370	\$27,924	\$2,115	\$1,073	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2017	\$46,803	\$7,077	\$31,023	\$4,136	\$1,141	\$29	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2018	\$51,732	\$7,822	\$34,290	\$1,655	\$1,206	\$31	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2019	\$56,944	\$8,610	\$37,744	\$9,310	\$1,270	\$33	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2020	\$66,483	\$10,054	\$44,074	\$11,848	\$1,332	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2021	\$151,084	\$10,997	\$77,113	\$14,073	\$1,366	\$36	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2022	\$79,359	\$12,000	\$52,602	\$16,310	\$1,458	\$38	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2023	\$86,423	\$13,068	\$57,285	\$18,500	\$1,520	\$39	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2024	\$93,964	\$14,208	\$62,283	\$20,802	\$1,581	\$41	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2025	\$115,209	\$17,421	\$76,365	\$54,965	\$1,642	\$42	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2026	\$120,782	\$18,263	\$80,059	\$28,749	\$1,649	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2027	\$125,780	\$19,170	\$84,035	\$29,592	\$1,600	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2028	\$135,239	\$20,147	\$88,316	\$30,549	\$1,668	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2029	\$137,145	\$20,738	\$90,805	\$31,166	\$1,680	\$43	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2030	\$141,138	\$21,942	\$93,552	\$31,844	\$1,692	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2031	\$288,723	\$21,967	\$98,871	\$46,017	\$1,703	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2032	\$146,982	\$22,328	\$98,751	\$46,138	\$1,709	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2033	\$152,832	\$23,110	\$101,303	\$46,910	\$1,714	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2034	\$156,838	\$23,715	\$103,958	\$47,714	\$1,719	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2035	\$160,681	\$24,289	\$106,472	\$48,498	\$1,725	\$44	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2036	\$164,204	\$24,828	\$108,840	\$49,251	\$1,731	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2037	\$167,891	\$25,387	\$111,285	\$40,019	\$1,737	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2038	\$171,697	\$25,962	\$113,807	\$40,802	\$1,743	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2039	\$175,625	\$26,556	\$116,411	\$41,600	\$1,749	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2040	\$179,680	\$27,173	\$119,098	\$42,414	\$1,755	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2041	\$183,865	\$27,802	\$121,873	\$43,245	\$1,760	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2042	\$188,166	\$28,445	\$124,736	\$44,089	\$1,766	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2043	\$192,645	\$29,100	\$127,683	\$44,947	\$1,772	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2044	\$197,249	\$29,768	\$130,744	\$45,814	\$1,777	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2045	\$202,908	\$30,445	\$133,894	\$46,690	\$1,783	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2046	\$208,643	\$31,137	\$137,147	\$47,573	\$1,788	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2047	\$211,974	\$32,052	\$140,504	\$48,463	\$1,793	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2048	\$217,203	\$32,843	\$143,970	\$49,363	\$1,799	\$46	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2049	\$222,601	\$289,986	\$147,548	\$180,810	\$1,804	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782
2050	\$228,174	\$34,502	\$151,242	\$53,543	\$1,809	\$47	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$90,782

TOTAL COST SUMMARY DATA
 (Includes Capital, Operation and Maintenance)
 (All cost amounts shown are in current Dollars)

Year	A Willow Park	B Alejo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	J W'ford (excluding raw water)	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$464,216	\$266,229	\$370,170	\$29,887	\$75,790	\$47,707	\$0	\$0	\$0	\$1,254,000	\$1,254,000
2001	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2003	\$107,906	\$101,407	\$392,400	\$26,337	\$24,169	\$15,213	\$3,668	\$1,936	\$0	\$673,035	\$673,035
2004	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2005	\$4,579,284	\$2,745,644	\$3,885,710	\$228,045	\$562,420	\$354,023	\$133,743	\$58,618	\$0	\$12,547,486	\$12,547,486
2006	\$146,545	\$79,979	\$133,855	\$11,988	\$29,560	\$18,607	\$7,384	\$3,210	\$4,547	\$435,675	\$435,675
2007	\$148,289	\$79,163	\$138,253	\$12,767	\$31,530	\$19,847	\$8,155	\$3,546	\$8,681	\$450,229	\$450,229
2008	\$150,404	\$78,843	\$143,186	\$13,490	\$33,361	\$20,999	\$8,878	\$3,861	\$12,507	\$465,530	\$465,530
2009	\$152,833	\$78,897	\$148,634	\$14,187	\$35,126	\$22,111	\$9,567	\$4,160	\$16,106	\$481,620	\$481,620
2010	\$155,801	\$79,378	\$154,009	\$14,901	\$36,931	\$23,247	\$10,249	\$4,458	\$19,574	\$498,547	\$498,547
2011	\$3,506,914	\$1,761,239	\$3,210,531	\$312,273	\$791,016	\$497,917	\$182,392	\$79,559	\$337,565	\$10,679,405	\$10,679,405
2012	\$243,319	\$122,434	\$243,943	\$24,798	\$62,000	\$39,027	\$17,824	\$7,761	\$37,812	\$798,918	\$798,918
2013	\$247,833	\$124,704	\$253,290	\$107,638	\$252,684	\$179,715	\$19,656	\$14,593	\$76,862	\$1,276,974	\$1,276,974
2014	\$253,097	\$127,349	\$262,747	\$28,525	\$71,406	\$44,948	\$21,490	\$9,360	\$49,221	\$868,143	\$868,143
2015	\$328,052	\$164,990	\$460,866	\$82,189	\$190,812	\$132,338	\$29,649	\$16,520	\$93,033	\$1,498,448	\$1,498,448
2016	\$330,987	\$166,297	\$416,918	\$40,144	\$100,548	\$63,573	\$31,436	\$13,785	\$80,195	\$1,243,883	\$1,243,883
2017	\$341,592	\$171,122	\$363,716	\$41,408	\$103,752	\$65,578	\$33,902	\$14,860	\$90,782	\$1,486,712	\$1,486,712
2018	\$1,470,578	\$723,062	\$1,536,247	\$172,851	\$428,731	\$270,131	\$585,095	\$251,107	\$806,475	\$6,244,276	\$6,244,276
2019	\$373,093	\$184,861	\$398,718	\$45,144	\$113,214	\$71,515	\$39,866	\$17,460	\$114,514	\$1,358,385	\$1,358,385
2020	\$410,263	\$201,622	\$436,912	\$49,524	\$124,313	\$78,493	\$209,258	\$96,440	\$408,955	\$2,015,779	\$2,015,779
2021	\$2,134,924	\$1,034,343	\$2,222,343	\$251,487	\$636,452	\$400,860	\$233,764	\$100,278	\$763,715	\$7,778,165	\$7,778,165
2022	\$444,429	\$213,912	\$465,689	\$53,598	\$134,621	\$84,969	\$53,374	\$21,514	\$170,855	\$1,642,961	\$1,642,961
2023	\$463,811	\$220,429	\$479,639	\$55,910	\$140,469	\$88,645	\$54,334	\$21,875	\$481,090	\$2,006,202	\$2,006,202
2024	\$484,859	\$227,200	\$493,216	\$58,421	\$146,820	\$92,638	\$55,398	\$22,288	\$202,193	\$1,783,033	\$1,783,033
2025	\$1,811,617	\$886,307	\$1,982,322	\$213,651	\$540,440	\$340,403	\$199,004	\$84,892	\$922,443	\$6,981,078	\$6,981,078
2026	\$606,472	\$275,215	\$591,111	\$72,793	\$183,224	\$115,550	\$65,032	\$26,429	\$263,297	\$2,199,123	\$2,199,123
2027	\$1,037,327	\$473,566	\$974,043	\$123,500	\$321,586	\$202,645	\$103,849	\$44,684	\$451,043	\$3,732,241	\$3,732,241
2028	\$673,642	\$293,890	\$620,537	\$80,808	\$203,498	\$128,314	\$68,685	\$27,995	\$287,737	\$2,385,105	\$2,385,105
2029	\$696,711	\$313,934	\$620,626	\$83,588	\$210,516	\$132,733	\$69,408	\$28,298	\$295,483	\$2,451,295	\$2,451,295
2030	\$720,472	\$300,183	\$620,591	\$86,453	\$217,750	\$137,288	\$70,131	\$28,600	\$303,409	\$2,484,878	\$2,484,878
2031	\$4,372,218	\$1,822,024	\$3,725,522	\$516,499	\$1,308,250	\$823,720	\$391,216	\$168,668	\$1,771,134	\$14,899,251	\$14,899,251
2032	\$772,962	\$310,817	\$633,634	\$92,738	\$233,642	\$147,293	\$72,613	\$29,664	\$321,964	\$2,615,328	\$2,615,328
2033	\$799,580	\$315,440	\$640,087	\$95,326	\$240,190	\$151,415	\$73,717	\$30,140	\$329,731	\$2,675,627	\$2,675,627
2034	\$817,203	\$319,724	\$646,833	\$98,025	\$247,018	\$155,714	\$74,862	\$30,534	\$337,812	\$2,727,826	\$2,727,826
2035	\$838,902	\$322,855	\$652,452	\$100,622	\$253,588	\$159,850	\$75,898	\$31,080	\$345,488	\$2,780,735	\$2,780,735
2036	\$859,646	\$325,090	\$656,932	\$103,108	\$259,876	\$163,809	\$76,821	\$31,477	\$352,734	\$2,829,494	\$2,829,494
2037	\$881,089	\$327,393	\$661,550	\$105,679	\$266,379	\$167,903	\$77,767	\$31,884	\$360,201	\$2,879,845	\$2,879,845
2038	\$903,256	\$329,765	\$800,226	\$130,056	\$273,104	\$172,137	\$78,736	\$32,302	\$367,899	\$3,087,482	\$3,087,482
2039	\$926,175	\$332,207	\$671,202	\$111,086	\$280,059	\$176,515	\$79,730	\$32,730	\$375,834	\$2,985,539	\$2,985,539
2040	\$1,099,136	\$387,163	\$781,601	\$131,569	\$331,984	\$209,201	\$92,392	\$38,248	\$442,198	\$3,513,492	\$3,513,492
2041	\$974,376	\$337,305	\$681,423	\$116,871	\$302,488	\$190,634	\$81,793	\$34,494	\$402,554	\$3,121,939	\$3,121,939
2042	\$2,193,549	\$747,048	\$1,504,610	\$261,076	\$660,358	\$415,902	\$174,213	\$73,933	\$864,213	\$6,894,901	\$6,894,901
2043	\$1,032,485	\$346,243	\$699,361	\$123,828	\$312,301	\$196,813	\$84,660	\$34,858	\$412,931	\$3,243,481	\$3,243,481
2044	\$1,058,890	\$349,454	\$705,801	\$126,997	\$320,319	\$201,860	\$85,830	\$35,363	\$422,048	\$3,306,562	\$3,306,562
2045	\$1,086,219	\$352,743	\$712,398	\$130,278	\$328,620	\$207,086	\$87,030	\$35,880	\$431,456	\$3,371,711	\$3,371,711
2046	\$1,126,048	\$359,795	\$726,555	\$135,041	\$340,681	\$214,678	\$89,105	\$36,780	\$445,592	\$3,474,276	\$3,474,276
2047	\$1,143,791	\$359,558	\$726,069	\$137,192	\$346,117	\$218,101	\$89,520	\$36,955	\$451,186	\$3,508,489	\$3,508,489
2048	\$1,174,106	\$363,086	\$733,146	\$140,835	\$355,335	\$223,904	\$90,811	\$37,513	\$461,527	\$3,580,263	\$3,580,263
2049	\$2,257,175	\$673,894	\$1,382,530	\$269,242	\$668,649	\$421,125	\$166,797	\$69,391	\$856,691	\$6,765,495	\$6,765,495
2050	\$1,237,982	\$370,387	\$747,792	\$148,514	\$374,769	\$236,139	\$93,491	\$38,670	\$483,217	\$3,730,961	\$3,730,961

Scenario 2

ADDED MONTHLY RATE INCREASE DUE TO CAPITAL COSTS

(Includes Capital Expenditures Only)
(All cost amounts shown are in current Dollars)

Year	A Willow Park	B Aledo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	Study Area Total	J W'ford (excluding raw water)	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$63	\$70	\$134	\$48	\$45	\$47	\$27	\$27	\$0	\$460	\$0	\$460
2001	\$61	\$67	\$125	\$46	\$44	\$45	\$27	\$26	\$0	\$441	\$0	\$441
2002	\$59	\$65	\$116	\$45	\$42	\$43	\$26	\$26	\$0	\$423	\$0	\$423
2003	\$57	\$63	\$108	\$43	\$41	\$42	\$26	\$26	\$0	\$406	\$0	\$406
2004	\$55	\$61	\$101	\$42	\$40	\$41	\$26	\$26	\$0	\$390	\$0	\$390
2005	\$53	\$59	\$94	\$40	\$38	\$39	\$25	\$25	\$26	\$400	\$0	\$400
2006	\$51	\$57	\$88	\$39	\$37	\$38	\$25	\$25	\$25	\$385	\$0	\$385
2007	\$50	\$55	\$82	\$38	\$36	\$37	\$25	\$25	\$24	\$370	\$0	\$370
2008	\$48	\$53	\$76	\$36	\$35	\$35	\$25	\$24	\$24	\$356	\$0	\$356
2009	\$47	\$52	\$71	\$35	\$33	\$34	\$24	\$24	\$23	\$343	\$0	\$343
2010	\$37	\$37	\$59	\$39	\$38	\$39	\$35	\$35	\$22	\$341	\$0	\$341
2011	\$36	\$35	\$55	\$38	\$37	\$38	\$34	\$35	\$22	\$329	\$0	\$329
2012	\$35	\$34	\$51	\$36	\$36	\$37	\$34	\$34	\$21	\$318	\$0	\$318
2013	\$34	\$33	\$48	\$35	\$35	\$35	\$34	\$34	\$21	\$307	\$0	\$307
2014	\$32	\$32	\$44	\$34	\$33	\$34	\$33	\$34	\$20	\$297	\$0	\$297
2015	\$31	\$31	\$41	\$33	\$32	\$33	\$33	\$33	\$37	\$304	\$0	\$304
2016	\$30	\$30	\$39	\$32	\$31	\$32	\$32	\$33	\$36	\$294	\$0	\$294
2017	\$29	\$29	\$36	\$31	\$30	\$31	\$32	\$32	\$35	\$285	\$0	\$285
2018	\$28	\$28	\$33	\$30	\$29	\$30	\$32	\$32	\$34	\$276	\$0	\$276
2019	\$27	\$27	\$31	\$29	\$28	\$29	\$31	\$32	\$33	\$267	\$0	\$267
2020	\$24	\$22	\$25	\$25	\$24	\$24	\$21	\$21	\$32	\$218	\$0	\$218
2021	\$23	\$21	\$23	\$24	\$23	\$23	\$21	\$21	\$31	\$211	\$0	\$211
2022	\$22	\$20	\$22	\$23	\$23	\$23	\$21	\$21	\$30	\$205	\$0	\$205
2023	\$22	\$20	\$20	\$22	\$22	\$22	\$20	\$21	\$29	\$198	\$0	\$198
2024	\$21	\$19	\$19	\$22	\$21	\$21	\$20	\$21	\$29	\$192	\$0	\$192
2025	\$20	\$18	\$18	\$21	\$20	\$20	\$20	\$20	\$19	\$177	\$0	\$177
2026	\$20	\$18	\$16	\$20	\$20	\$20	\$20	\$20	\$18	\$171	\$0	\$171
2027	\$19	\$17	\$15	\$20	\$19	\$19	\$19	\$20	\$18	\$166	\$0	\$166
2028	\$18	\$17	\$14	\$19	\$18	\$18	\$19	\$20	\$17	\$161	\$0	\$161
2029	\$18	\$16	\$14	\$18	\$18	\$18	\$19	\$19	\$17	\$157	\$0	\$157
2030	\$15	\$11	\$10	\$15	\$15	\$15	\$11	\$11	\$16	\$120	\$0	\$120
2031	\$14	\$11	\$10	\$15	\$14	\$14	\$11	\$11	\$16	\$117	\$0	\$117
2032	\$14	\$10	\$10	\$14	\$14	\$14	\$11	\$11	\$15	\$114	\$0	\$114
2033	\$13	\$10	\$10	\$14	\$13	\$13	\$11	\$11	\$15	\$111	\$0	\$111
2034	\$13	\$10	\$10	\$13	\$13	\$13	\$11	\$11	\$15	\$108	\$0	\$108
2035	\$13	\$10	\$10	\$13	\$13	\$13	\$11	\$11	\$5	\$96	\$0	\$96
2036	\$12	\$10	\$10	\$13	\$12	\$12	\$10	\$10	\$4	\$94	\$0	\$94
2037	\$12	\$10	\$10	\$12	\$12	\$12	\$10	\$10	\$4	\$92	\$0	\$92
2038	\$11	\$10	\$10	\$12	\$11	\$11	\$10	\$10	\$4	\$90	\$0	\$90
2039	\$11	\$10	\$10	\$11	\$11	\$11	\$10	\$10	\$4	\$88	\$0	\$88
2040	\$4	\$3	\$3	\$4	\$4	\$4	\$4	\$4	\$4	\$35	\$0	\$35
2041	\$4	\$3	\$3	\$4	\$4	\$4	\$4	\$4	\$4	\$34	\$0	\$34
2042	\$4	\$3	\$3	\$4	\$4	\$4	\$3	\$3	\$4	\$33	\$0	\$33
2043	\$4	\$3	\$3	\$4	\$4	\$4	\$3	\$3	\$4	\$32	\$0	\$32
2044	\$4	\$3	\$3	\$4	\$4	\$4	\$3	\$3	\$4	\$32	\$0	\$32
2045	\$4	\$3	\$3	\$4	\$4	\$4	\$3	\$3	\$1	\$29	\$0	\$29
2046	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$1	\$28	\$0	\$28
2047	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$1	\$28	\$0	\$28
2048	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$1	\$27	\$0	\$27
2049	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$1	\$27	\$0	\$27
2050	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$1	\$26	\$0	\$26

Scenario 2

ANNUALIZED CAPITAL COST (10 YEAR FINANCING PACKAGES)

(Includes Capital Expenditures Only)
(All cost amounts shown are in current Dollars)

Year	A Willow Park	B Aledo	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	Study Area Total	J W'ford (excluding raw water)	Total
1998	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1999	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2000	\$818,679	\$455,023	\$770,345	\$71,127	\$171,498	\$110,794	\$73,740	\$32,040	\$0	\$2,503,245	\$0	\$2,503,245
2001	\$818,679	\$455,023	\$770,345	\$71,127	\$171,498	\$110,794	\$73,740	\$32,040	\$0	\$2,503,245	\$0	\$2,503,245
2002	\$818,679	\$455,023	\$770,345	\$71,127	\$171,498	\$110,794	\$73,740	\$32,040	\$0	\$2,503,245	\$0	\$2,503,245
2003	\$818,679	\$455,023	\$770,345	\$71,127	\$171,498	\$110,794	\$73,740	\$32,040	\$0	\$2,503,245	\$0	\$2,503,245
2004	\$818,679	\$455,023	\$770,345	\$71,127	\$171,498	\$110,794	\$73,740	\$32,040	\$0	\$2,503,245	\$0	\$2,503,245
2005	\$818,679	\$455,023	\$770,345	\$71,127	\$171,498	\$110,794	\$73,740	\$32,040	\$194,761	\$2,698,006	\$0	\$2,698,006
2006	\$818,679	\$455,023	\$770,345	\$71,127	\$171,498	\$110,794	\$73,740	\$32,040	\$194,761	\$2,698,006	\$0	\$2,698,006
2007	\$818,679	\$455,023	\$770,345	\$71,127	\$171,498	\$110,794	\$73,740	\$32,040	\$194,761	\$2,698,006	\$0	\$2,698,006
2008	\$818,679	\$455,023	\$770,345	\$71,127	\$171,498	\$110,794	\$73,740	\$32,040	\$194,761	\$2,698,006	\$0	\$2,698,006
2009	\$818,679	\$455,023	\$770,345	\$71,127	\$171,498	\$110,794	\$73,740	\$32,040	\$194,761	\$2,698,006	\$0	\$2,698,006
2010	\$673,578	\$334,778	\$685,565	\$81,424	\$203,493	\$130,933	\$106,917	\$47,168	\$194,761	\$2,458,617	\$0	\$2,458,617
2011	\$673,578	\$334,778	\$685,565	\$81,424	\$203,493	\$130,933	\$106,917	\$47,168	\$194,761	\$2,458,617	\$0	\$2,458,617
2012	\$673,578	\$334,778	\$685,565	\$81,424	\$203,493	\$130,933	\$106,917	\$47,168	\$194,761	\$2,458,617	\$0	\$2,458,617
2013	\$673,578	\$334,778	\$685,565	\$81,424	\$203,493	\$130,933	\$106,917	\$47,168	\$194,761	\$2,458,617	\$0	\$2,458,617
2014	\$673,578	\$334,778	\$685,565	\$81,424	\$203,493	\$130,933	\$106,917	\$47,168	\$194,761	\$2,458,617	\$0	\$2,458,617
2015	\$673,578	\$334,778	\$685,565	\$81,424	\$203,493	\$130,933	\$106,917	\$47,168	\$365,991	\$2,629,847	\$0	\$2,629,847
2016	\$673,578	\$334,778	\$685,565	\$81,424	\$203,493	\$130,933	\$106,917	\$47,168	\$365,991	\$2,629,847	\$0	\$2,629,847
2017	\$673,578	\$334,778	\$685,565	\$81,424	\$203,493	\$130,933	\$106,917	\$47,168	\$365,991	\$2,629,847	\$0	\$2,629,847
2018	\$673,578	\$334,778	\$685,565	\$81,424	\$203,493	\$130,933	\$106,917	\$47,168	\$365,991	\$2,629,847	\$0	\$2,629,847
2019	\$673,578	\$334,778	\$685,565	\$81,424	\$203,493	\$130,933	\$106,917	\$47,168	\$365,991	\$2,629,847	\$0	\$2,629,847
2020	\$607,401	\$276,259	\$590,920	\$73,169	\$181,599	\$114,310	\$72,456	\$32,319	\$365,991	\$2,314,425	\$0	\$2,314,425
2021	\$607,401	\$276,259	\$590,920	\$73,169	\$181,599	\$114,310	\$72,456	\$32,319	\$365,991	\$2,314,425	\$0	\$2,314,425
2022	\$607,401	\$276,259	\$590,920	\$73,169	\$181,599	\$114,310	\$72,456	\$32,319	\$365,991	\$2,314,425	\$0	\$2,314,425
2023	\$607,401	\$276,259	\$590,920	\$73,169	\$181,599	\$114,310	\$72,456	\$32,319	\$365,991	\$2,314,425	\$0	\$2,314,425
2024	\$607,401	\$276,259	\$590,920	\$73,169	\$181,599	\$114,310	\$72,456	\$32,319	\$365,991	\$2,314,425	\$0	\$2,314,425
2025	\$607,401	\$276,259	\$590,920	\$73,169	\$181,599	\$114,310	\$72,456	\$32,319	\$246,825	\$2,195,258	\$0	\$2,195,258
2026	\$607,401	\$276,259	\$590,920	\$73,169	\$181,599	\$114,310	\$72,456	\$32,319	\$246,825	\$2,195,258	\$0	\$2,195,258
2027	\$607,401	\$276,259	\$590,920	\$73,169	\$181,599	\$114,310	\$72,456	\$32,319	\$246,825	\$2,195,258	\$0	\$2,195,258
2028	\$607,401	\$276,259	\$590,920	\$73,169	\$181,599	\$114,310	\$72,456	\$32,319	\$246,825	\$2,195,258	\$0	\$2,195,258
2029	\$607,401	\$276,259	\$590,920	\$73,169	\$181,599	\$114,310	\$72,456	\$32,319	\$246,825	\$2,195,258	\$0	\$2,195,258
2030	\$525,206	\$199,074	\$418,349	\$63,811	\$156,622	\$98,588	\$43,375	\$18,890	\$246,825	\$1,770,741	\$0	\$1,770,741
2031	\$525,206	\$199,074	\$418,349	\$63,811	\$156,622	\$98,588	\$43,375	\$18,890	\$246,825	\$1,770,741	\$0	\$1,770,741
2032	\$525,206	\$199,074	\$418,349	\$63,811	\$156,622	\$98,588	\$43,375	\$18,890	\$246,825	\$1,770,741	\$0	\$1,770,741
2033	\$525,206	\$199,074	\$418,349	\$63,811	\$156,622	\$98,588	\$43,375	\$18,890	\$246,825	\$1,770,741	\$0	\$1,770,741
2034	\$525,206	\$199,074	\$418,349	\$63,811	\$156,622	\$98,588	\$43,375	\$18,890	\$246,825	\$1,770,741	\$0	\$1,770,741
2035	\$525,206	\$199,074	\$418,349	\$63,811	\$156,622	\$98,588	\$43,375	\$18,890	\$79,976	\$1,603,892	\$0	\$1,603,892
2036	\$525,206	\$199,074	\$418,349	\$63,811	\$156,622	\$98,588	\$43,375	\$18,890	\$79,976	\$1,603,892	\$0	\$1,603,892
2037	\$525,206	\$199,074	\$418,349	\$63,811	\$156,622	\$98,588	\$43,375	\$18,890	\$79,976	\$1,603,892	\$0	\$1,603,892
2038	\$525,206	\$199,074	\$418,349	\$63,811	\$156,622	\$98,588	\$43,375	\$18,890	\$79,976	\$1,603,892	\$0	\$1,603,892
2039	\$525,206	\$199,074	\$418,349	\$63,811	\$156,622	\$98,588	\$43,375	\$18,890	\$79,976	\$1,603,892	\$0	\$1,603,892
2040	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$79,976	\$641,248	\$0	\$641,248
2041	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$79,976	\$641,248	\$0	\$641,248
2042	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$79,976	\$641,248	\$0	\$641,248
2043	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$79,976	\$641,248	\$0	\$641,248
2044	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$79,976	\$641,248	\$0	\$641,248
2045	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$33,908	\$595,179	\$0	\$595,179
2046	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$33,908	\$595,179	\$0	\$595,179
2047	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$33,908	\$595,179	\$0	\$595,179
2048	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$33,908	\$595,179	\$0	\$595,179
2049	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$33,908	\$595,179	\$0	\$595,179
2050	\$209,162	\$66,894	\$136,569	\$24,756	\$62,385	\$39,269	\$15,505	\$6,731	\$33,908	\$595,179	\$0	\$595,179

Scenario 2

ADDED MONTHLY RATE INCREASE BASED ON TOTAL COST
 (Based on System Capital, Operation and Maintenance)
 (All cost amounts shown are in current Dollars)

Year	A Willow Park	B Aleido	C Hudson Oaks	D Annetta North	E Annetta	F Annetta South	G Fort Worth North	H Fort Worth South	I Non-City SE Parker	Study Area Total	J W'ford (excluding raw water)	Total
1998	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
1999	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$651.34	\$0.00	\$651.34
2000	\$87.13	\$94.17	\$189.44	\$70.56	\$67.87	\$69.11	\$36.31	\$36.76	\$0.00	\$624.68	\$0.00	\$624.68
2001	\$84.26	\$91.07	\$176.54	\$68.19	\$65.59	\$66.79	\$35.89	\$36.34	\$0.00	\$599.34	\$0.00	\$599.34
2002	\$81.49	\$88.07	\$164.51	\$65.90	\$63.39	\$64.55	\$35.49	\$35.92	\$0.00	\$575.24	\$0.00	\$575.24
2003	\$78.81	\$85.18	\$153.30	\$63.69	\$61.27	\$62.39	\$35.08	\$35.52	\$0.00	\$552.32	\$0.00	\$552.32
2004	\$76.22	\$82.38	\$142.86	\$61.56	\$59.21	\$60.30	\$34.68	\$35.11	\$43.43	\$573.94	\$0.00	\$573.94
2005	\$73.72	\$79.67	\$133.13	\$59.49	\$57.23	\$58.27	\$34.29	\$34.71	\$42.24	\$551.99	\$0.00	\$551.99
2006	\$71.29	\$77.05	\$124.06	\$57.50	\$55.31	\$56.32	\$33.90	\$34.32	\$41.09	\$531.06	\$0.00	\$531.06
2007	\$68.95	\$74.52	\$115.61	\$55.57	\$53.45	\$54.43	\$33.13	\$33.54	\$39.97	\$511.10	\$0.00	\$511.10
2008	\$66.68	\$72.07	\$107.73	\$53.71	\$51.66	\$52.61	\$32.76	\$33.16	\$38.89	\$492.06	\$0.00	\$492.06
2009	\$64.49	\$69.70	\$100.40	\$51.91	\$49.93	\$50.84	\$32.76	\$33.16	\$38.89	\$492.06	\$0.00	\$492.06
2010	\$76.83	\$74.19	\$121.03	\$79.54	\$78.58	\$79.53	\$59.04	\$58.72	\$37.83	\$665.28	\$0.00	\$665.28
2011	\$74.30	\$71.75	\$112.78	\$76.87	\$75.95	\$76.86	\$58.37	\$58.05	\$36.80	\$641.73	\$0.00	\$641.73
2012	\$71.86	\$69.39	\$105.10	\$74.30	\$73.40	\$74.28	\$57.70	\$57.39	\$35.79	\$619.22	\$0.00	\$619.22
2013	\$69.50	\$67.11	\$97.94	\$71.80	\$70.94	\$71.79	\$57.05	\$56.74	\$34.82	\$597.69	\$0.00	\$597.69
2014	\$67.21	\$64.90	\$91.27	\$69.40	\$68.56	\$69.38	\$56.40	\$56.10	\$33.87	\$577.09	\$0.00	\$577.09
2015	\$65.00	\$62.77	\$85.05	\$67.07	\$66.26	\$67.06	\$55.76	\$55.46	\$74.16	\$598.58	\$0.00	\$598.58
2016	\$62.86	\$60.70	\$79.26	\$64.82	\$64.04	\$64.81	\$55.12	\$54.83	\$72.14	\$578.58	\$0.00	\$578.58
2017	\$60.80	\$58.71	\$73.86	\$62.65	\$61.89	\$62.63	\$54.50	\$54.20	\$70.17	\$559.41	\$0.00	\$559.41
2018	\$58.80	\$56.78	\$68.83	\$60.54	\$59.82	\$60.53	\$53.88	\$53.59	\$68.26	\$541.02	\$0.00	\$541.02
2019	\$56.86	\$54.91	\$64.14	\$58.51	\$57.81	\$58.50	\$53.27	\$52.98	\$66.40	\$523.39	\$0.00	\$523.39
2020	\$70.93	\$60.49	\$68.66	\$73.39	\$72.53	\$72.61	\$55.19	\$53.40	\$64.59	\$591.79	\$0.00	\$591.79
2021	\$68.60	\$58.50	\$63.98	\$70.93	\$70.09	\$70.17	\$54.56	\$52.80	\$62.83	\$572.47	\$0.00	\$572.47
2022	\$66.34	\$56.58	\$59.63	\$68.55	\$67.74	\$67.82	\$53.94	\$52.20	\$61.12	\$553.92	\$0.00	\$553.92
2023	\$64.16	\$54.72	\$55.56	\$66.25	\$65.47	\$65.55	\$53.32	\$51.60	\$59.46	\$536.10	\$0.00	\$536.10
2024	\$62.05	\$52.92	\$51.78	\$64.03	\$63.28	\$63.35	\$52.72	\$51.02	\$57.84	\$518.97	\$0.00	\$518.97
2025	\$60.01	\$51.18	\$48.25	\$61.88	\$61.15	\$61.22	\$52.12	\$50.44	\$63.77	\$510.03	\$0.00	\$510.03
2026	\$58.04	\$49.50	\$44.96	\$59.81	\$59.10	\$59.17	\$51.53	\$49.86	\$62.04	\$494.00	\$0.00	\$494.00
2027	\$56.13	\$47.87	\$41.90	\$57.80	\$57.12	\$57.19	\$50.94	\$49.29	\$60.35	\$478.59	\$0.00	\$478.59
2028	\$54.28	\$46.29	\$39.05	\$55.86	\$55.20	\$55.27	\$50.36	\$48.73	\$58.70	\$463.76	\$0.00	\$463.76
2029	\$52.50	\$44.77	\$39.00	\$53.99	\$53.35	\$53.41	\$49.79	\$48.18	\$57.11	\$452.10	\$0.00	\$452.10
2030	\$61.54	\$43.96	\$38.51	\$63.31	\$62.54	\$62.60	\$47.65	\$45.50	\$55.55	\$481.17	\$0.00	\$481.17
2031	\$59.52	\$42.52	\$38.51	\$61.19	\$60.45	\$60.51	\$47.10	\$44.98	\$54.04	\$468.81	\$0.00	\$468.81
2032	\$57.56	\$41.12	\$38.51	\$59.14	\$58.42	\$58.48	\$46.57	\$44.47	\$52.57	\$456.83	\$0.00	\$456.83
2033	\$55.67	\$39.77	\$38.51	\$57.15	\$56.46	\$56.51	\$46.04	\$43.97	\$51.13	\$445.21	\$0.00	\$445.21
2034	\$53.84	\$38.46	\$38.51	\$55.24	\$54.57	\$54.62	\$45.52	\$43.47	\$49.74	\$433.95	\$0.00	\$433.95
2035	\$52.07	\$37.84	\$38.51	\$53.38	\$52.74	\$52.79	\$45.00	\$42.97	\$37.56	\$412.86	\$0.00	\$412.86
2036	\$50.35	\$37.84	\$38.51	\$51.59	\$50.97	\$51.02	\$44.49	\$42.48	\$36.54	\$403.79	\$0.00	\$403.79
2037	\$48.70	\$37.84	\$38.51	\$49.86	\$49.26	\$49.31	\$43.98	\$42.00	\$35.54	\$395.00	\$0.00	\$395.00
2038	\$47.10	\$37.84	\$38.51	\$48.19	\$47.61	\$47.65	\$43.48	\$41.52	\$34.57	\$386.48	\$0.00	\$386.48
2039	\$45.55	\$37.84	\$38.51	\$46.58	\$46.01	\$46.06	\$42.99	\$41.05	\$33.63	\$378.21	\$0.00	\$378.21
2040	\$25.31	\$19.58	\$19.72	\$25.72	\$25.58	\$25.61	\$22.83	\$21.76	\$32.72	\$218.82	\$0.00	\$218.82
2041	\$24.47	\$19.58	\$19.72	\$24.86	\$24.72	\$24.75	\$22.57	\$21.51	\$31.83	\$214.01	\$0.00	\$214.01
2042	\$23.67	\$19.58	\$19.72	\$24.03	\$23.90	\$23.92	\$22.32	\$21.26	\$30.96	\$209.34	\$0.00	\$209.34
2043	\$22.89	\$19.58	\$19.72	\$23.22	\$23.09	\$23.12	\$22.06	\$21.02	\$30.12	\$204.82	\$0.00	\$204.82
2044	\$22.14	\$19.58	\$19.72	\$22.44	\$22.32	\$22.34	\$21.81	\$20.78	\$29.30	\$200.42	\$0.00	\$200.42
2045	\$21.41	\$19.58	\$19.72	\$21.69	\$21.57	\$21.59	\$21.56	\$20.55	\$11.93	\$179.60	\$0.00	\$179.60
2046	\$20.71	\$19.58	\$19.72	\$20.96	\$20.85	\$20.87	\$21.32	\$20.31	\$11.61	\$175.91	\$0.00	\$175.91
2047	\$20.03	\$19.58	\$19.72	\$20.26	\$20.15	\$20.17	\$21.08	\$20.08	\$11.29	\$172.34	\$0.00	\$172.34
2048	\$19.37	\$19.58	\$19.72	\$19.58	\$19.47	\$19.49	\$20.84	\$19.85	\$10.98	\$168.88	\$0.00	\$168.88
2049	\$18.73	\$19.58	\$19.72	\$18.92	\$18.82	\$18.84	\$20.60	\$19.63	\$10.68	\$165.51	\$0.00	\$165.51
2050	\$1.56	\$1.56	\$1.57	\$1.58	\$1.57	\$1.57	\$1.57	\$1.68	\$1.59	\$10.39	\$23.07	\$23.07

APPENDIX N - ELECTRONIC SPREADSHEET (In Envelope)

SEPCWATR.XLS (See attached Envelope)