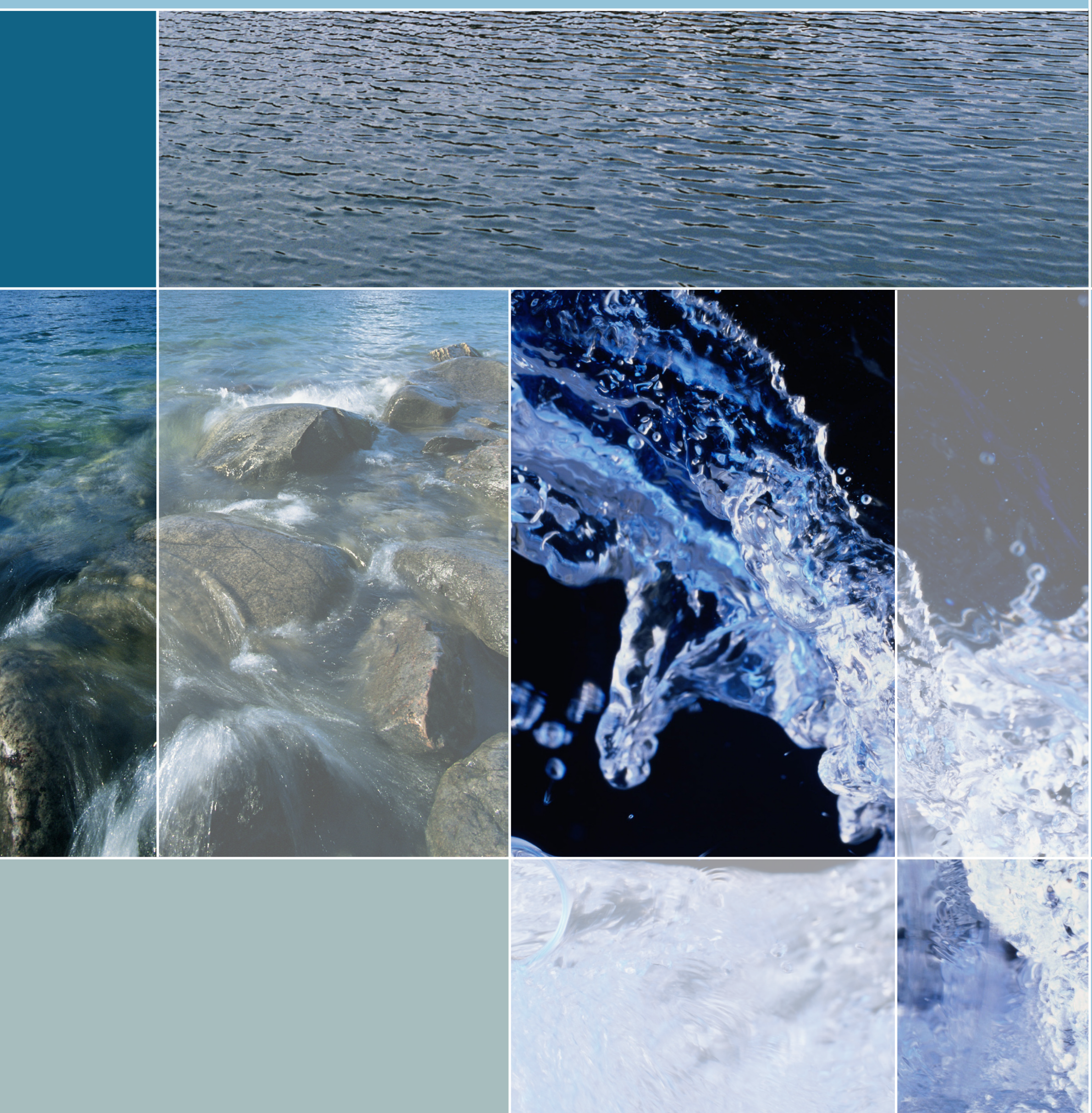
Socioeconomic Analysis of Selected Interbasin Transfers in Texas

NOVEMBER 2006

DRAFT REPORT

prepared for

TEXAS WATER DEVELOPMENT BOARD



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R·W·BECK

November 17, 2006

Mr. Stuart Norvell
Texas Water Development Board
1700 N Congress Avenue
Austin, Texas 78711-3231

Dear Mr. Norvell:

In July 2006, Texas Water Development Board contracted with R.W. Beck to perform a Socioeconomic Analysis of Selected Interbasin Transfers in Texas. Attached, please find our completed ***draft*** report which details the study methodology, a discussion of the analysis performed, and our findings and conclusions.

We appreciate the opportunity to provide our professional services to the Texas Water Development Board and would like to express our sincere appreciation to you and the other Texas Water Development Board Staff members who assisted us during the course of this engagement.

Should you or other Texas Water Development Board Staff members require additional information or clarification regarding the attached report, please do not hesitate to contact Mr. Jack E. Stowe, Jr. or Mr. Chris Ekrut at (972) 994-0300. We look forward to receiving your comments and incorporating them into the final report.

Very truly yours,

R.W. Beck, Inc.

Socioeconomic Analysis of Selected Interbasin Transfers in Texas

Prepared by:

R.W. Beck, Inc.

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EXECUTIVE SUMMARY

In July of 2006, the Texas Water Development Board (TWDB) contracted with R.W. Beck, Inc. (R.W. Beck) to perform a research study to examine the Socioeconomic Impacts of Major Interbasin Transfers in Texas. The impetus for this study was to examine the effect of Senate Bill 1, as passed during the regular session of the 75th Texas Legislature, which reduced the legal status of water rights transferred out of their Basin of Origin.

As the legal status of a water right changes, it is perceived by many that its economic value also changes. Because of the legislation passed in Senate Bill 1, and its effect on water rights, there is a perception throughout the state that the economic value of interbasin transfers has diminished; therefore, alternative water management strategies have been relied upon in regional planning to the exclusion of potential interbasin transfers (IBTs). This over-reliance on alternative strategies may potentially tax other limited sources of water and lead to the inability to provide water for future generations of Texans.

Despite the perceived change in their economic value, interbasin transfers represent a viable, and in some cases the only feasible, water management strategy. As such, any legislation that negatively impacts their use by regional water planning groups must be scrutinized. Specifically, the socioeconomic impact of such transfers (i.e., the economic and social value of water transferred) must be considered so as to determine the impact this legislation has, if any, on citizens of the State of Texas.

The goal of the study was to answer four specific research questions as follows:

1. Is the junior priority provision as contained within Texas Water Code Section 11.085 negatively impacting the consideration of interbasin transfers by the regional water planning groups in the state?
2. Are there other readily identifiable factors which are impacting the consideration of interbasin transfers in the regional planning process?
3. What is the economic impact of selected interbasin transfers, and are they viable water management strategies as compared to alternative strategies considered by the regional water planning groups?
4. Has the junior priority provision negatively impacted the marketing of water rights in the state?

In performing this study, R.W. Beck examined the following three specific interbasin transfers as chosen by TWDB Staff:

- Bedias Reservoir Interbasin Transfer
- Toledo Bend Interbasin Transfer
- Lower Guadalupe Water Supply Project

The study performed by R.W. Beck encompassed three specific points of analysis. First, to examine the factors that are considered in regional planning which may effect the reliance of regional water planning groups on interbasin transfers, R.W. Beck's Project Team performed cost comparisons between the identified interbasin transfers and alternative management strategies as selected by TWDB Staff. The objective of this analysis was to examine the cost factors associated with each interbasin transfer and the selected alternatives to each transfer to determine the present value unit cost of each strategy.

Second, the Project Team performed a socioeconomic analysis of each selected interbasin transfer. The goal of this analysis was to determine the economic costs and benefits that accrue to the Basin of Origin and the Receiving Basin resulting from the conveyance of water. Additionally, when possible, R.W. Beck identified the social impacts that would accrue to each area. The objective of this analysis was to determine, to the greatest extent possible, the positive or negative economic impact to society resulting from the selected interbasin transfers.

Third, R.W. Beck's Project Team performed a market survey of water rights transactions in Texas. This element of the study was designed to attempt to determine the effect, if any, the junior priority provision has on the value of water rights within the State.

Based upon the analysis conducted, the Project Team offers the following findings and conclusions:

- In the regional plans examined, there is a heavy, if not sole, reliance on interbasin transfers. In addition, nearly all of the regional water planning groups studied noted the importance of interbasin transfers.
- It is the Project Team's conclusion that the junior priority provision has not negatively impacted the <u>consideration</u> of interbasin transfers in the regional planning process. However, R.W. Beck would recommend that further study be performed on whether the junior priority provision has impacted the <u>implementation</u> of interbasin transfers.
- Other factors which appear to influence the regional planning groups' decisions in regards to interbasin transfers include the significant costs associated with such transfers and the environmental impact, coupled with public opposition, of interbasin transfers.
- There is significant net economic benefit associated with interbasin transfers. However, despite this significant net benefit, there are negative impacts to the Basin of Origin. While the economic impacts are more than offset by the economic benefits which accrue to the Basin of Origin, all competing policy objectives must be considered in pursuing such transfers.
- It is the Project Team's conclusion that interbasin transfers do represent a viable water management strategy in terms of total economic benefit; however, they are not necessarily the first choice when considered with a purely cost-based focus.

- It is the Project Team's opinion that the market for water rights in Texas is not sufficiently developed so as to draw any affirmative conclusions regarding the impact of the junior priority provision.

It is R.W. Beck's overall conclusion that the junior priority provision is not adversely affecting the consideration of interbasin transfers in Texas. However, the provision may potentially have a minor impact on specific projects. R.W. Beck recommends that this policy issue continue to be researched, reviewed, and scrutinized in the coming years to verify that the provision does not impact interbasin transfer as they begin to be more heavily utilized as water management strategies.

In terms of legislative recommendations, R.W. Beck recommends that, at this time, no change be made to Texas Water Code Section 11.085. Specifically, the junior priority provision should be left intact until verifiable evidence exists that it is truly having a negative impact on interbasin transfers in the State.

R.W. Beck would however strongly encourage policymakers during the next legislative session to give consideration to potential state participation in funding interbasin transfers. As discussed and reiterated by the regional water planning groups, interbasin transfers represent a critical water management strategy in meeting the future need of water in the state. However, without financial assistance or funding alternatives, it is likely that water suppliers will not actively pursue major interbasin transfers.

Section 1
Introduction and Background

1.1 Introduction and Purpose of Research

In July of 2006, the Texas Water Development Board (TWDB) contracted with R.W. Beck, Inc. (R.W. Beck) to perform a research study to examine the Socioeconomic Impacts of Major Interbasin Transfers in Texas. The impetus for this study was to examine the effect of Senate Bill 1, as passed during the regular session of the 75th Texas Legislature, which reduced the legal status of water rights transferred out of their Basin of Origin.

As the legal status of a water right changes, it is perceived by many that its economic value also changes. Because of the legislation passed in Senate Bill 1, and its effect on water rights, there is a perception throughout the state that the economic value of interbasin transfers has diminished; therefore, alternative water management strategies have been relied upon in regional planning to the exclusion of potential interbasin transfers (IBTs). This over-reliance on alternative strategies may potentially tax other limited sources of water and lead to the inability to provide water for future generations of Texans.

Despite the perceived change in their economic value, interbasin transfers represent a viable, and in some cases the only feasible, water management strategy. As such, any legislation that negatively impacts their use by regional water planning groups must be scrutinized. Specifically, the socioeconomic impact of such transfers (i.e., the economic and social value of water transferred) must be considered so as to determine the impact this legislation has, if any, on citizens of the State of Texas.

1.2 Background on Interbasin Transfers

Title 2, Subtitle B, Chapter 11, Subchapter A, Section 11.085 of the Texas Water Code which governs interbasin transfers, defines an interbasin transfer as the taking or diverting of state water from a river basin and transferring such water to any other river basin. According to Texas Water Code § 11.002 (11), a river basin does not include water originating in the bays and arms of the Gulf of Mexico. Based upon this statute, it is R.W. Beck's interpretation, and agreed to by TWDB Staff, that water taken from the Gulf of Mexico does not constitute an interbasin transfer.

Key elements of an interbasin transfer include the:

- Basin of Origin – The river basin or body of water from which the water originates

- Receiving Basin – The river basin or body of water which receives the water
- Conveyance system – The means by which the water is conveyed from the Basin of Origin to the Receiving Basin. Conveyance systems can be composed of natural or man-made features.

Interbasin transfers are by no means a new phenomenon in the State. They have been critical to meeting water demands in the State for many years. Interbasin transfers are necessary in as much as population growth and the related demand for water in certain parts of the state has exceeded available supplies. Should policy makers choose to sustain growth, and to reap the economic benefits associated with growth, transferring underutilized water resources from one area of the state to another where it can be fully utilized is necessary.

Section 11.085 of the Texas Water Code has been amended by four pieces of legislation which include the following:

- S.B. 1139, 65th Regular Session of the Texas Legislature
- S.B. 1, 75th Regular Session of the Texas Legislature
- S.B. 2, 77th Regular Session of the Texas Legislature
- S.B. 312, 77th Regular Session of the Texas Legislature

The following discusses the impact each piece of legislation had on the laws governing interbasin transfers.

S.B. 1139

S.B. 1139, passed during the 65th legislature, created the Texas Department of Water Resources (TDWR). As part of this act, Section 11.085 of the Texas Water Code was created to govern interbasin transfers (then referred to as interwatershed transfers). Under the statutes as passed, no person could take water from one basin (stream, watercourse, or wastershed) and transfer it to another basin (stream, watercourse, or watershed) if it would prejudice anyone currently situated in the originating basin. According to Texas Courts, this meant that "a balancing test between the determents to the Basin of Origin and the benefits to the Receiving Basin" had to be performed.[1] Additionally, no transfer could occur without first receiving permit for such a transfer from the Texas Water Commission (a Predecessor to the Texas Commission on Environmental Quality (TCEQ)). Such a permit would only be granted after a hearing of the Commission in which they reviewed how the rights of others would be affected by the transfer. Additionally, the statutes as passed set out penalties and fines for anyone violating the provisions of this section.

[1] Senate Select Committee on Water Policy, *Interim Report to the 79th Legislature*, December 2004, Appendix F, Page 2.

S.B. 1

With the passage of S.B. 1 during the 75th legislative session, the statutes governing interbasin transfers changed significantly. Prior to S.B. 1, the only standard for not granting an interbasin transfer was if it prejudiced someone in the basin of origin. As previously discussed, this meant that the TCEQ must perform a balancing test between the detriments to the basin of origin and the benefits to the receiving basin. S.B. 1 further codified the requirements of this test by requiring the Commission to grant interbasin transfers only when the detriments to the basin of origin were less than the benefits to the receiving basin and only when the application contained drought contingency and water conservation plans. S.B. 1 also required the Commission to consider the following when granting interbasin transfers:

- the need for the water in the basin of origin and in the proposed receiving basin based on the period for which the water supply is requested, but not to exceed 50 years;
- the availability of feasible and practicable alternative supplies in the receiving basin to the water proposed for transfer;
- the amount and purposes of use in the receiving basin for which water is needed;
- proposed methods and efforts by the receiving basin to avoid waste and implement water conservation and drought contingency measures;
- proposed methods and efforts by the receiving basin to put the water proposed for transfer to beneficial use;
- the projected economic impact that is reasonably expected to occur in each basin as a result of the transfer;
- the projected impacts of the proposed transfer that are reasonably expected to occur on existing water rights, instream uses, water quality, aquatic and riparian habitat,
- proposed mitigation or compensation, if any, to the basin of origin by the applicant; and
- the continued need to use the water for the purposes authorized under the existing permit, certified filing, or certificate of adjudication, if an amendment to an existing water right is sought.

In addition to these requirements, SB 1 added additional administrative requirements in applying for a permit for an interbasin transfer. Applicants must now provide:

- the contract price of the water to be transferred;
- a statement of each general category of proposed use of the water to be transferred and a detailed description of the proposed uses and users under each category;
- the cost of diverting, conveying, distributing, and supplying the water to, and treating the water for, the proposed users; and

- the projected effect on user rates and fees for each class of ratepayers.

Additionally, the Commission must take the following administrative actions:

- Hold at least one public meeting to receive comments in both the Basin of Origin and the Receiving Basin
- If the application is contested, the Commission must post notice and conduct an evidentiary hearing
- Notice of application must be mailed to the following, located in part or in whole, within the Basin of Origin
  - all holders of permits, certified filings, or certificates of adjudication
  - each county judge
  - each mayor of a City with a population of 1,000 or more
  - all groundwater conservation districts
  - each state legislator in both basins
- Notice must be published in general circulation newspapers meeting specific requirements and must be paid for by the applicant
- Request review and comment on the application by each county judge of a county located in part or in whole within the basin of origin

Possibly the most controversial section of S.B. 1 amends Section 11.085 of the Texas Water Code to make the water transferred in an interbasin transfer junior in priority to water rights granted prior to the interbasin transfer application. This provision, commonly referred to as the junior priority provision, is important in as much as the State of Texas uses a "first in time, first in right" method of allocating surface water. Under this provision, in times of drought, older or "senior" water rights would have priority access to their water right allotment before holders of newer or "junior" water rights permits would be able to access their allotment. Essentially, this makes junior water rights from an interbasin less reliable, and potentially less valuable.

Finally, unlike S.B. 1139, S.B. 1 does exclude certain transfers of water from the provisions of Texas Water Code 11.085. These include transfers of less than 3,000 acre-feet annual; an emergency transfer; a transfer from a basin to its adjoining coastal basin; and a transfer from a basin to a county or municipality either wholly or partially within the same basin.

As noted by a briefing memorandum of the Texas Senate Select Committee on Water Policy, "Since the passage of Senate Bill 1 in 1997, interbasin transfers have been the subject of endless discussions and the focus topic of innumerable water law conferences, legislative hearings, water policy seminars and symposiums, state agency agendas, work sessions and briefings, and a wide range of other public policy forums."[2] This extensive consideration is likely due to the polarized opinions water industry professionals have regarding this piece of legislation. Supporters of S.B. 1

[2] Senate Select Committee on Water Policy, *Interim Report to the 79th Legislature*, December 2004, Page 6

claim that it provides the TCEQ with specific guidelines to follow when granting interbasin transfers and should help to minimize litigation on such issues.

Supporters also assert that the additional notice and hearing requirements provide greater opportunity for public input. Compensation provisions within the bill are also championed by supporters as this would help to offset any impacts to the Basin of Origin. Finally, supporters claim that the term limitations with S.B. 1, that is limiting the term of the transfer to the term of the associated water supply contract, helps to avoid conflict and is more equitable for both basins.

Opponents of S.B. 1 claim that the junior priority provision will limit or end transfers of water in Texas and ultimately damage water management within the State. In other words, this provision provides a disincentive which will result in consideration of other water management strategies to the exclusion of interbasin transfers. As stated in the House Research Organization's analysis of S.B. 1, dated May 21, 1997, "Few cities or other entities would be willing to pay the substantial infrastructure expenses to facilitate an interbasin transfer if they knew that their claim could be preempted by senior water rights holders just when they needed the water the most, such as in a time of drought." Opponents also claim that junior rights provision will make it impossible to market water rights in the state as the value of such rights would diminish as their priority date is amended. Finally, opponents assert that the substantial administrative requirements place too many barriers to successfully achieving a water transfer and that the provisions do not apply equally between the basins. For example, the Receiving Basin is required to implement conservation measures while the Basin of Origin is not.

Another group of opponents to S.B. 1 claim that interbasin transfers should not be granted at all as they pose too great a risk to the Basin of Origin, adjoining basins, and downstream flows. These opponents also cite the potential adverse impact to economic development in the Basin of Origin that cannot be foreseen. Finally, this group of opponents to S.B. 1 claim that the TNRCC (now the TCEQ) should be required to weight the projected impacts of the transfer on existing water rights in the Basin of Origin. S.B. 1 only requires an analysis based upon historical use, not a consideration as if the existing water rights in the Basin of Origin were being fully utilized. Failure to consider these circumstances may impair the rights of users that have purchased water to meet future needs.

S.B. 2

During the 77th regular session, the Texas Legislature passed S.B. 2. Many consider S.B. 2 to simply be an addition to S.B. 1 passed during the 75th legislative session as it clarified and reemphasized certain aspects of the earlier piece of legislation. Interbasin transfers are only given brief mention in this bill. First, the legislation amends Section 11.085 to state that "a river basin may not be redesignated in order to allow a transfer or diversion of water." Under S.B. 1, this clause stated that "a basin may not be redesignated." It appears that the word "river" was added to clarify the original provisions of S.B. 1.

Much to the dismay of opponents, S.B. 2 did reemphasize the importance of retaining the junior water rights provision related to interbasin transfers as originally enacted in S.B. 1. Supporters continue to assert that this provision protects water resources for communities during times of drought and "ensures that supplies are not sold off to the highest bidder."[3] Additionally, supporters claim that this provision brings more parties to the negotiating table as "dealing with junior water rights requires the participation of parties other than the water supplier and purchaser."[4]

Opponents of S.B. 2, similar to the supporters, continue their arguments based upon the retention of the junior water rights provision. They continue to claim that the junior water rights provision will eliminate interbasin transfers in the state because of the lack of assurance associated with the water being transferred. By maintaining this provision, which they claim would eliminate the consideration of interbasin transfers, opponents claims that this legislation does not address the future water needs of Texas.

S.B. 312

S.B. 312, also passed during the 77th regular session, contains the same language as that contained in S.B. 2 related to the redesignation of river basins. This bill relates to the Sunset Commission's review of the Texas Water Development Board and does not have a significant impact on section 11.085 of the Texas Water Code.

Legislative Intent

According to Wasinger and Mason, it appears that the TNRCC Regulatory Document entitled "A Regulatory Guidance Document for Applications to Divert, Store or Use State Water" encapsulates the intent of S.B. 1 and the rules currently governing interbasin transfers[5]. This document outlines several water resource management principles including the following:

- Is water available?
- Is there a need for the water?
- What are the impacts on existing water rights, instream uses and environmental water needs?
- Is the public welfare protected?

In adopting the previously discussed legislative changes to Texas Water Code Section 11.085, it appears that the legislature's intent was to codify these principles into laws which governed the transfer of water. However, opponents of the current rules claim that the legislature went too far in applying these principles. The main arguments offered by opponents assert that:

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[3] House Research Organization, Bill Analysis of S.B. 2, 5/21/2001
[4] Ibid
[5] Wasinger, Bruce and Thomas Mason, "Interbasin Transfers – A Problem Resolved? Basin of Origin Protection," *Texas Water Law Institute, Senate Bill 1 – "A New Chapter in Texas Water Law," October 23 – 24, 1997*

- The junior rights provision as adopted in S.B. 1 provides disincentive and will result in the abandonment of interbasin transfers as a water management strategy
- The administrative provisions that applicants must adhere to obtain a permit to engage in an interbasin transfer provide further disincentive to pursue an application

1.3 Regional Planning Perceptions

Within the regional planning documents that were reviewed as part of this study, it was discovered that the perceptions that exist regarding Section 11.085 tend to align with those who are opposed to S.B. 1 and the additional requirements placed on interbasin transfers. For example, the 2006 Region C water plan states:

"The effect of these changes is to make obtaining a permit for interbasin transfers significantly more difficult than it was under prior law and thus to discourage the use of interbasin transfers. This is undesirable for several reasons:

- Interbasin transfers have been used extensively in Texas and are an important part of the state's current water supply. For example, current permits allow interbasin transfers of over 600,000 acre-feet per year from the Red, Sulphur, Sabine, and Neches Basins to meet needs in the Trinity Basin in Region C. This represents almost one-third of the region's reliable water supply.
- Current supplies greatly exceed projected demands in some basins, and the supplies already developed in those basins can only be used through interbasin transfers.
- Senate Bill One water supply plans for major metropolitan areas in Texas (Dallas-Fort Worth, Houston, and San Antonio) rely on interbasin transfers as a key component of their plans.
- Texas water law has always regarded surface water as belonging to the people of the state, to be used for the benefit of the state as a whole.
- The current requirements for permitting interbasin transfers provide an unnecessary barrier to development of the best, most economical, and most environmentally acceptable water supplies.
- Since no contested interbasin transfer permits have been granted under these new requirements, the meaning of some of the provisions and the way in which they will be applied by TCEQ are undefined."[6]

Based on these arguments, the Region C plan goes on to recommend the legislature revisit Section 11.085 of the Texas Water Code and remove some of "the unnecessary and counterproductive barriers to such transfers."

[6] 2006 Region C Water Plan, Page 8.16 to 8.17

The Region H water plan essentially affirms the same arguments as proffered by Region C, and specifically addresses the junior priority provision. The Region H Plan states "under the current Texas Water Code, water rights developed as a result of an interbasin transfer become junior to other water rights granted before the interbasin transfer permit. The effect of this change is to make obtaining a permit for interbasin transfer significantly more problematic than it was under prior law and thus discourages the use of interbasin transfers for water supply. This is undesirable for several reasons:

- Current supplies greatly exceed projected demands in some basins, and the supplies already developed in those basins can only be used via interbasin transfers (Trinity Basin within Region H).
- Interbasin transfers have been used extensively in Texas and are an important part of the state's current water supply. For example, three of the five Region H Major Water Providers (City of Houston, Trinity River Authority, and San Jacinto River Authority) maintain current permits for interbasin transfers collectively of over 1,000,000 acre-feet per year. Virtually all future water demands within the San Jacinto basin (Harris County in particular) of Region H must rely on interbasin transfers.
- Emerging regional water supply plans for major metropolitan areas in Texas (Dallas-Fort Worth and San Antonio) rely on interbasin transfers as a key component of their plans. It is difficult to envision developing a water supply for these areas without significant new interbasin transfers."[7]

The Region H Plan, similar to the Region C plan, goes on to recommend that the legislature "revise the current law on interbasin transfers and remove the unnecessary and counterproductive barriers to such transfers."

The Region L plan presents both sides of the debate concerning the current interbasin transfer statutes. As part of the regional planning process, Region L members considered both the positive and negative impacts of the changes made to Section 11.085 of the Texas Water Code by S.B. 1. The Region L plan states, "Among the negative impacts cited by some members are these:

- It imposes limitations on surface water rights permits that have previously been issued, possibly diminishing the value of some permits to the owners.
- It forces greater use of groundwater supplies, and potentially, encourages the mining of aquifers.
- It can result in construction of new reservoirs that would not be needed if seniority of rights and existing environmental flow requirements were preserved in interbasin transfers because of the need to provide reliable water supplies in the plans.

Other members of the Region L planning group cite the following positive effects of the new interbasin transfer provisions:

[7] 2006 Region H Water Plan, Page 8-20

- "The junior water rights provision protects municipalities and other water users, especially in cases where the interbasin transfer of senior water rights would put junior water rights at risk.
- Bays and estuaries and instream flows have added protection from the impact of water exportation.
- Establishing the seniority of Basin of Origin water rights over those used for export preserves the economic value of the resource for the future development of the Basin of Origin"[8]

Based on these arguments, the Region L planning group chose not to make a recommendation regarding legislative changes to Texas Water Code Section 11.085.

1.4 Research Questions

As a result of the aforementioned discussion, the analysis performed by R.W. Beck's Project Team was designed to answer the following questions:

1. Is the junior priority provision as contained within Texas Water Code Section 11.085 negatively impacting the consideration of interbasin transfers by the regional water planning groups in the state?
2. Are there other readily identifiable factors which are impacting the consideration of interbasin transfers in the regional planning process?
3. What is the economic impact of selected interbasin transfers, and are they viable water management strategies as compared to alternative strategies considered by the regional water planning groups?
4. Has the junior priority provision negatively impacted the marketing of water rights in the state?

The ultimate goal of this study is to provide an opinion regarding the current legislation governing interbasin transfers, including a determination of the impact of the junior priority provision as it currently pertains to interbasin transfers.

This report has been structured to be of greatest assistance to policymakers in the state. As such, Section 2 of this report provides our findings and conclusions from the study and our legislative recommendations. The remainder of the report, which discusses the analysis conducted, is outlined as follows:

- Section 3 of this report discusses the methodology employed by R.W. Beck's Project Team in conducting the various facets of this study.
- Sections 4, 5, and 6, discuss the three interbasin transfers considered during the course of this study and the analysis performed for each interbasin transfer.
- Section 7 discusses the market survey of water rights transactions performed by the Project Team.

[8] 2006 South Central Texas Regional Water Plan, Page 8-3 to 8-4

Appendices to this report have also been included to illustrate the results of our analysis and to further clarify our findings and recommendations.

Section 2
Findings and Conclusion

2.1 Findings and Conclusions

As previously discussed, R.W. Beck's analysis was designed to answer specific research questions. What follows are our findings and conclusions for each specific question.

1. **Is the junior priority provision as contained within Texas Water Code Section 11.085 negatively impacting the consideration of interbasin transfers by the regional water planning groups in the state?**

During our review of the 2001 and 2006 regional water plans for Regions C, H, and L, the Project Team noted that there is a heavy, if not sole, reliance on interbasin transfers to meet the projected needs of the regional water planning groups. In fact, nearly all of the regional water planning groups studied noted the importance of interbasin transfers and stressed how interbasin transfers have been relied upon during the regional planning process.

To further illustrate the reliance on interbasin transfers, TWDB Staff initially selected the Interbasin Transfer from the proposed Lake Ralph Hall reservoir as a candidate for study. However, based on R.W. Beck's review of comparable alternative water management strategies by the probable sponsor of the lake and pipeline, the Upper Trinity Regional Water District, the only available options were alternative interbasin transfers. A key tenet of this study was to compare the selected interbasin transfer with alternative water management strategies that did not consist of interbasin transfers. In order to determine if other management strategies existed, R.W. Beck met with representatives of the Upper Trinity Regional Water District who confirmed our findings and reiterated the critical importance of interbasin transfers to meeting the needs of their customers.

Despite this reliance on interbasin transfers, the transfers considered as part of this study have not been recommended as water management strategies. The Bedias Reservoir Interbasin Transfer has been listed as an alternative management strategy and will likely not be implemented within the foreseeable future. The Toledo Bend Interbasin Transfer is listed as a long-term supply strategy, but is not recommended for near-term implementation. Finally, the Lower Guadalupe Water Supply Project is not listed as a recommended strategy and has been modified to meet the needs of GBRA's statutory district as opposed to the projected needs in Bexar County.

Based on the analysis conducted, it is the Project Team's conclusion that the junior priority provision has not negatively impacted the consideration of interbasin transfers in the regional planning process. On the contrary, interbasin transfers represent a heavily replied upon water management strategy by all of the regional planning groups studied. While the junior priority provision may have an impact in certain situations, this impact is not wide-spread and does not appear to diminish the reliance on interbasin transfers in meeting projected needs.

R.W. Beck would however recommend that the question be altered to address whether the junior priority provision has impacted the implementation of interbasin transfers. During the market survey, as discussed in Section 6, the TCEQ provided Project Team members a listing of all current interbasin transfers and whether those transfers were subject to the provisions of S.B. 1, in other words the junior priority provision. This listing is provided herein as Appendix A. As can be seen in this listing, out of the current interbasin transfers in the state, twenty (20) are subject to the provisions of S.B.1. However, out of these twenty (20) transfers, all but one were applied for and granted as exempt from the junior priority provision.

Based on these results, one could potentially conclude that of those interbasin transfers which have been applied for and granted since the passage of S.B. 1, most have been modified so as to achieve the requirements necessary to be exempt from the junior priority provision. As this element lies beyond the scope of this particular study, R.W. Beck would recommend that TWDB undertake a study to verify whether the junior priority provision has caused water providers to modify their implementation of interbasin transfers so as to be granted an exemption, and thereby circumvent, the junior priority provision.

2. Are there other readily identifiable factors which are impacting the consideration of interbasin transfers in the regional planning process?

As part of this analysis, R.W. Beck attempted to identify if there were any other verifiable factors which are impacting the consideration of interbasin transfers in the regional planning process. However, based on the above discussion, it was discovered that consideration during the regional planning process is not the primary issue. Interbasin transfers still remain a significant part of the regional planning process regardless of the junior priority provision.

Despite the above finding, R.W. Beck did focus its efforts to determine if any identifiable factors were present which caused the interbasin transfers considered as part of this study to not be relied upon as, or considered solely as long-term, water management strategies. During the course of the study, several key issues regarding the interbasin transfers in question continued to arise. First, there appears to be significant concern regarding the cost of interbasin transfers. The movement of water from one area to another is often associated with significant infrastructure investment and related cost. In undertaking such an effort, and for it to make fiscal sense, significant amounts of water must be transferred. At present, and as illustrated by the cost comparisons within this study, there still exist water management strategies that are significantly more economical on a per unit basis than interbasin transfers. While many of these alternative strategies cannot provide the same amount of water as an interbasin transfer, they can meet immediate needs at a lower cost. Until the projected need is realized, and until that need cannot be met by more financially feasible strategies, it is likely that interbasin transfers will serve as the water supply strategy of last resort. Additionally, without some form of financial assistance at the state or federal levels, it is likely that interbasin transfers will only be relied upon as long-term strategies, or as strategies of last resort.

To further illustrate this concern, the Project Team researched the current outstanding debt associated with raw water supply of the major water providers who are currently listed as potential participants in the Toledo Bend Interbasin Transfer. Table 2-1 below compares the outstanding debt associated with raw water supply with the debt service principal cost each party would incur according to the figures in the current Region C Plan.

Table 2-1
Comparison of Participants Current Outstanding Debt to Estimated Debt Principal Incurred for Toledo Bend Interbasin Transfer

Participant	Current Outstanding Debt	Estimated Debt Principal Incurred from Transfer[1]
Dallas Water Utilities	$ 7.2 million	$ 851 million
North Texas Municipal Water District	$ 376 million	$ 854 million
Tarrant Regional Water District	$473 million	$ 1.05 billion

As illustrated in the table above, the Toledo Bend Interbasin Transfer would result in a significant increase in each participant's outstanding debt. Additionally, it should be noted that these figures only include the cost of debt service and does not include the operation and maintenance costs of the project or cost of raw water; therefore, the actual cost to each participant will be even higher. Without some measure of financial assistance from the State and/or Federal level, it is unlikely that a water supplier would engage in a major interbasin transfer in the short-term when more economical and cost effective options are available.

Second, there appears to be significant opposition to the construction of new reservoirs, as recommended in the case of the Bedias Reservoir. In reviewing the public comments made regarding the 2001 and 2006 regional plans, there is a significant and vocal opposition to the construction of reservoirs prior to full utilization of existing water resources. Opposition to new reservoirs stems primarily from the environmental impact of flooding land to create such reservoirs and the impact the building of reservoirs would have on privately held property.

Third, there is significant opposition to interbasin transfers, particularly the Lower Guadalupe Water Supply Project (LGWSP), due to the environmental impact of the transfer. In the case of the LGWSP, there is public concern regarding the impact the project would have on inflows to other bays and estuaries below the

[1] Estimates calculated according to figures contained within 2006 Region C Plan

Guadalupe Saltwater Barrier. There is also some concern as to the impact this project may have on endangered wildlife habitats.

R.W. Beck would note that the opposition to the Lower Guadalupe Water Supply Project is substantial, particularly when compared with the other two interbasin transfers considered as part of this study. During the Region L planning process, a public meeting was held in Victoria and attended by over 500 individuals opposed to this project. Forty-eight written and oral comments were received addressing "the aversion to a pipeline for ground and surface water, concerns over groundwater availability and modeling results, and concerns over surface water availability as well as the impacts to bays and estuaries."[2] Based on this opposition, one sponsor of this project, San Antonio Water System (SAWS), pulled out of the project and began seeking other water supply alternatives.

Based on our review of regional planning documents and our analysis during the course of this study, it appears that the cost of interbasin transfers are a key factor which affects the consideration of transfers by regional planning groups. It is likely that until the need for water is sufficient enough to merit investment in the infrastructure necessary to transfer water, or until other financing options or financial assistance is provided for these projects, regional water planning groups will likely continue to implement more economical water supply projects, while considering interbasin transfers to meet long-term needs. However, it should be noted that this method of operation only postpones the inevitable. Interbasin transfers are essential to meeting the future water needs present throughout the state.

R.W. Beck would also cite the perceived environmental impact of interbasin transfers as another factor which effects the consideration of interbasin transfers by regional water planning groups. By far, those opposed interbasin transfers on the basis of the environmental impact are some of the most vocal participants in the regional water planning process.

3. **What is the economic impact of selected interbasin transfers, and are they viable water management strategies as compared to alternative strategies considered by the regional water planning groups?**

Findings:

Based on the analysis conducted by the Project Team, there appears to be a significant net economic benefit of all of the interbasin transfers selected for study. This impact ranges from a low of approximately $68 billion to a high of approximately $1.3 trillion.

Despite the significant net economic benefit, and the positive economic benefits that accrue to the Receiving Basin and Basin of Origin, there are also economic costs to the Basin of Origin. While these costs are more than offset by the benefits that accrue to the Basin of Origin, one cannot discount these negative impacts. In

[2] 2006 Region L Plan, Page 10-28

particular, the negative social impacts, which could not be quantified as part of this study, should be considered by regional water planning groups as they look to interbasin transfers to meet projected needs.

As was discussed earlier in regards to the Lower Guadalupe Water Supply Project, it appears that the regional planning group members have indeed considered these negative impacts when considering water management strategies. In the case of the LGWSP, the regional planning group members listened to the opposition who felt the negative social impacts of the project were significant enough to oppose the strategy. Despite the economic benefits that would accrue, the regional planning group chose to meet the projected water needs through other means, including a modified version of the LGWSP.

Ultimately, the decision to pursue an interbasin transfer is a policy issue that must consider all of the competing objectives. If the most important objective is increasing total economic benefit, then the regional planning groups should consider the interbasin transfers analyzed in this study. If the most important objective is providing water at the most economical price, then interbasin transfers should not be considered as a viable water management strategies in the short-term.

Based upon the above analysis, it is the Project Team's conclusion that the total net economic impact of interbasin transfers is beneficial and significant. This economic benefit accrues not only to the parties to the water transaction, but also to the state as a whole.

It should however be noted that not all impacts of interbasin transfers are positive. There are negative economic and social impacts, many of which cannot be quantified. The decision to pursue interbasin transfers is thus a policy decision in which competing objectives must be compared, and difficult decisions made.

It is also the Project Team's conclusion that interbasin transfers do represent a viable water management strategy in terms of total economic benefit; however, they are not necessarily the first choice when considered with a purely cost-based focus. Other water management strategies have a lower unit cost, thus making them more attractive to water suppliers. However, in the long-term, as the projected need for water increases, it is likely that the need for water will outweigh the cost of interbasin transfers.

4. Has the junior priority provision negatively impacted the marketing of water rights in the state?

During the course of our analysis, the Project Team was unable to find transactions which fit the research criteria. As such, our findings on this particular question are limited. While some transactions are occurring, R.W. Beck has found only limited transactions in which the priority date of the water right changed, and, in the cases where these transactions were discovered, the change in the priority date did not have an effect as the water rights senior to the transferred water right were already owned by the same entity. The Project Team did find a limited water market in

Texas, but this market is limited to small transactions and involved very few surface water transactions.

At the present time, the market for water rights in Texas is not sufficiently developed so as to draw any affirmative conclusions regarding the impact of the junior priority provision. Without comparable transactions, it is not possible, under the methodology employed by the Project Team and endorsed by TWDB Staff, to affirm or deny the impact of the junior priority provision. As the water market in Texas matures, further study will be required to determine if the junior priority provision does have the impact its opponents claim.

R.W. Beck would conclude, based on the fact that there are limited surface water transactions, that those holding surface water rights consider those rights more valuable than what individuals are willing to pay for those rights. As the projected water needs are realized in the state, it is likely that more surface water transactions will in fact occur, and that the purchase price for this rights will be significant.

Based upon our analysis and our findings to date, R.W. Beck's overall conclusion is that the junior priority provision is not adversely affecting the consideration of interbasin transfers in the state. In all of the regional planning documents reviewed by the Project Team, interbasin transfers represent the majority, if not the only, viable water management strategy in the future.

The Project Team would note however that the provision may potentially have a minor impact on specific projects. For example, in the LGWSP, it is possible that the junior priority provision had a minor impact in this project's demise. However, this impact is limited to the existing water rights and is in no way associated with the new water right appropriation and the groundwater associated with firming up the project yield. It is likely that the public opposition to this project is what ultimately led to its dismissal and revision as a recommended water management strategy. It is the Project Team's opinion that this project would likely have been dismissed based on factors other than the junior priority provision.

R.W. Beck recommends that this policy issue continue to be researched, reviewed, and scrutinized in the coming years to verify that the provision does not impact interbasin transfer as they begin to be more heavily utilized as water management strategies. Specifically, it appears at this time that some water providers may be structuring interbasin transfers to be exempt from the provisions of Texas Water Code Section 11.085. If that is the case, then the provisions in the code should be changed so as to allow water providers to meet the needs in their basin without significant hindrance. R.W. Beck also recommends that this topic continue to be addressed in future TWDB research studies.

2.2 Legislative Recommendations

At this time, R.W. Beck recommends that no changes be made to Texas Water Code Section 11.085. Specifically, the junior priority provision should be left intact until verifiable evidence exists that it is truly having a negative impact on interbasin transfers in the State.

R.W. Beck would however strongly encourage policymakers during the next legislative session to give consideration to potential state participation in funding interbasin transfers. As discussed and reiterated by the regional water planning groups, interbasin transfers represent a critical water management strategy in meeting the future need of water in the state. However, without financial assistance or funding alternatives, it is likely that water suppliers will not actively pursue interbasin transfers. As demonstrated in this report, the financial impact of such transfers is significant, and can have a detrimental effect on a water supplier without direct assistance at the state or federal level.

Interbasin transfers represent an important and necessary means by which the need for water will be met in the state in the coming years. As the needs projected by the regional water planning groups are realized, lawmakers must make certain that any unnecessary hindrances to the interbasin transfer of water are removed. The being said, it will also be important to balance the need for interbasin transfers with the means to protect the Basin of Origin. This will not be an easy balance to achieve, and one that will need to be refined for years to come.

The issue of interbasin transfers will not diminish, nor will the voices of the opponents and supporters of such mechanisms. The legislative approach to interbasin transfers must consider and balance the needs of all citizens of this State, while ensuring that water is available for future generations of Texans.

Section 3
Study Methodology

The following section discusses the methodologies utilized in conducting the study. Whenever possible, TWDB guidelines and assumptions employed in the regional planning process were utilized.

3.1 Study Preparation

Prior to beginning the analysis required for this study, R.W. Beck's Project Team held several meetings with TWDB Staff. The purpose of these meetings was to define the goals and objectives of the study as well as to narrow and refine the research questions. Another goal of these meetings was to determine which interbasin transfers would be examined as part of the Project Team's analysis. Upon the completion of these meetings, TWDB Staff selected the following interbasin transfers for consideration

- Bedias Reservoir Interbasin Transfer
- Toledo Bend Interbasin Transfer
- Lower Guadalupe Water Supply Project

Each of these projects is discussed more thoroughly in the corresponding section of this report.

As previously mentioned, TWDB Staff also initially selected for study the interbasin transfer from the proposed Lake Ralph Hall in the Sulfur River Basin to users in Denton and Collin Counties. However, based on R.W. Beck's review of comparable alternative water management strategies by the probable sponsor of the lake and pipeline, the Upper Trinity Regional Water District, the only available alternatives included other interbasin transfers. A key tenet of this study was to compare the selected interbasin transfer with alternative water management strategies that did not consist of interbasin transfers. In order to determine if other management strategies existed, R.W. Beck met with representatives of the Upper Trinity Regional Water District who confirmed our findings and reiterated the critical importance of interbasin transfers to meeting the needs of their customers. Based upon these discussions, and with the approval of TWDB Staff, the interbasin transfer from the proposed Lake Ralph Hall Reservoir was dropped from further study.

3.2 Analysis

In addition to determining which interbasin transfers would be considered, R.W. Beck presented TWDB Staff with its proposed scope of work and the methodologies that would be employed during the study. The following methodologies were ultimately approved by TWDB Staff and employed by the Project Team.

3.2.1 Cost Comparisons

To examine the factors that are considered in regional planning which may effect the reliance of regional water planning groups on interbasin transfers, it was necessary to compare each interbasin transfer with alternative water management strategies which do not constitute interbasin transfers. To determine the alternatives to be compared, R.W. Beck examined the 2001 and 2006 regional water plans and compiled a list of the water management strategies considered, in addition to the identified interbasin transfer, by each respective planning group considering one of the selected interbasin transfers. This list was then annotated to note the strategies which could supply the same or similar yield of water as the interbasin transfers in question. Once compiled, members of R.W. Beck's Project Team met with TWDB staff to determine which alternatives would be compared to each respective interbasin. TWDB Staff members ultimately selected the following alternatives for comparison with the subject interbasin transfer.

- Bedias Reservoir Interbasin Transfer

  R.W. Beck considered two alternative water management strategies with respect to this transfer. The first involves obtaining additional contracted raw water supply for Montgomery County from San Jacinto River Authority (SJRA). The second involves obtaining water from the Freeport Water Desalination Project. Currently, Montgomery County, which would be served by the Bedias – SJRA Interbasin Transfer, has not been considered as a recipient of water from the Freeport Water Desalination Project. However, this is the only potential water management strategy that is not an interbasin transfer which could supply a similar quantity of water to Montgomery County.

- Toledo Bend Interbasin Transfer

  R.W. Beck's Project Team considered an alternative water supply consisting of desalinated water from the Gulf of Mexico as the alternative to this transfer.

- Lower Guadalupe Water Supply Project (LGWSP)

  Alternatives chosen for comparison with this transfer included a supply of groundwater from the Carrizo aquifer, also known as the SAWS Gonzales – Carrizo Project, and seawater desalination.

Each of these alternatives is more fully discussed within the section of this report which corresponds to the appropriate transfer.

The objective of the cost comparisons was to provide an analysis of the different strategies with specific economic factors taken into account including an assumed construction time period, time value of money, and realizable firm yield of each strategy over a 50 year time frame. As part of this analysis, and to ensure accurate comparisons, the Project Team applied the same base assumptions to each strategy.

The strategies presented in the regional plans and evaluated by the Project Team varied, in that some of the strategies included the estimated cost to distribute the water and/or treat the water at its final destination while a number of the strategies include only the cost of transmitting the water to the local wholesale provider and do not include the final treatment costs. Based upon TWDB Staff recommendation, any identifiable costs associated with additional treatment and/or distribution by the wholesale water supplier were omitted from the comparison. However, treatment costs for desalination projects were included in the cost comparisons as the saltwater must be treated before it is conveyed to the wholesale providers.

It was also necessary when determining the present value cost per acre-foot, for comparative purposes, to assume that at the time the respective project comes online, the full yield of acre-feet would be utilized. The amount supplied by the projects in the cost comparisons will not necessarily be consumed in equal amounts for every year of the project life. The amount supplied to each water supplier will be based upon their need, and the amount of water needed from each project to fill that respective need. Therefore, by assuming the full amount of yield will be utilized in every year in developing the calculation, the present value cost per acre foot reflects the total estimated amount of cost that would be incurred to produce every acre-foot of water throughout the 50 year time horizon on a uniform comparable basis.

Once the alternative water management strategies were finalized for comparison, R.W Beck’s Project Team utilized the 2001 and 2006 regional water plans to acquire cost information for each transfer as well as each alternative water management strategy. In most cases, this information was provided in second quarter 2002 dollars. At the request of TWDB staff, R.W. Beck’s Project Team updated all costs to second quarter 2005 dollars utilizing the Construction Cost Index published by Engineering News – Record (“ENR”) or other appropriate indices which included the Producer Price Index, Operations and Maintenance percentage allocations illustrated in the TWDB water management strategy reports, and the Handy-Whitman Index of Public Utility Construction Costs. The construction costs were escalated by the actual ENR index factors from mid-year 2002 to mid-year 2005. Escalations in construction costs beyond 2005 were applied to the historical average percentage increase illustrated in the ENR index.

Once the cost data was updated, R.W. Beck then performed a 50-year present value cost analysis of the life-cycle costs for each transfer. In this analysis, the Project Team considered annual debt service, operation and maintenance costs, and water source costs, where applicable. When possible to separately identify, the cost categories below were inflated annually based on the following indices:

- Electricity cost were escalated utilizing the producer price index for industrial electrical power
- Chemical costs were escalated utilizing the producer price index for industrial chemicals
- Treatment cost associated with desalinated seawater were escalated based upon the average annual increase in NARUC Account 320 (Large Treatment Plant Equipment) according to the Handy-Whitman Index of Public Utility Construction Costs (Water Utility Construction), South Central Region
- Any costs which could not be unbundled were escalated annually utilizing an assumed 3% inflation factor

For this analysis, the 30-year nominal treasury interest rate for 2005 was employed as the discount factor. Additionally, R.W. Beck assumed that there would be a time-lag between when the projects began construction and when water would first be available. Based on conversations with our engineering staff, the Project Team assumed the following construction lag times.

- Strategies involving pipeline construction only – 3 years
- Strategies involving desalination plants – 5 years
- Strategies involving the construction of reservoirs – 20 years[1]

Upon completing the present value cost analysis, the value of each alternative was analyzed in total and on a per unit basis of water supplied calculated utilizing the estimated firm yield multiplied by the number of years the project will be online during the 50 year life.

3.2.2 Socioeconomic Impact Analysis

As water is transferred from one basin to another, economic costs and benefits also accrue to each area. For example, as water is received by the Receiving Basin, it supports additional population growth and related economic activity from this increased population. Likewise, when an interbasin transfer calls for the construction of the Basin of Origin, there will be an economic loss as farm land is removed from production.

In addition to those costs and benefits that can be quantified, other costs and benefits accrue that cannot be quantified. For example, if a transfer of water negatively impacts the bays and estuaries of a specific area, wildlife habitats may be impacted. As wildlife habitats are negatively impacted, there is a social loss to society; however, it is difficult if not impossible to quantify this social impact.

To the extent possible, R.W. Beck's Project Team has sought to quantify the net economic impact of each respective interbasin transfer. The purpose of

[1] Assumes the time period from initial planning and permitting to delivery of water from completed and filled reservoir.

such analysis is to determine, if an interbasin transfer is not considered because of the junior priority provision, what will the positive or negative economic impact be to society.

As each interbasin transfer is different and relies upon different assumptions, each respective analysis is discussed within the corresponding section of this report. It should be noted that in developing the socioeconomic impact for each interbasin transfer, R.W. Beck's Project Team used the actual projected water shortages by year as estimated by the TWDB Regional Water Plans to determine the additional population that could be supported as a result of the interbasin transfer. This differs from our cost comparison methodology in which the full yield of each project was realized on an annual basis regardless of need.

At its most simplistic level, the socioeconomic impact analysis involves determining the costs and benefits of each interbasin transfer and projecting these impacts to the region. One key element of this analysis is the economic multiplier effect, named after the multiplicative effect that takes place in an economy following some initial stimulus. For example, an increase in construction activity will have a direct impact on the economy, but will also lead to an increase in output of supplying industries (material suppliers, engineering and consulting firms, food and lodging providers, etc.). This combined increase in industry output will lead to the creation of jobs, resulting in additional household income. To determine the economic multipliers, economic impact assessment software created by IMPLAN (Impact Analysis for Planning) has been used.[2] This software is employed by the Army Corps of Engineers in assessing the economic impact of proposed projects.

The IMPLAN software, as described by the Minnesota Implan Group, applies *Input-Output-Analysis* as a means of examining relationships within an economy, both between businesses and between businesses and final consumers. It captures monetary market transactions for consumption in a given time period using actual data from local economies. It considers social security tax and income tax leakage, institution savings, and commuting. It also accounts for inter-institutional transfers.

There are two phases in the input-output analysis:

1. Descriptive modeling
2. Predictive modeling

Descriptive Model

A descriptive model includes information about local economic interactions known as regional economic accounts. This model describes a local economy in terms of the flow of dollars from purchasers to producers within the region. Trade flows are also part of the descriptive model. They describe the

[2] Olson, Doug and Scott Lindall, "Implan Professional Software, Analysis, and Data Guide, Minnesota IMPLAN Group, Inc.

movements of goods and services within a region and outside world. Non-industrial transactions such as payment of taxes by businesses and households are estimated by creating social accounting data.

Predictive Model

The regional economic accounts are used to construct local level multipliers which represent the predictive model. Purchases for final demand (final use) drive an input-output model. Industries producing goods and services for consumption purchase goods and services from other producers. These other producers in turn purchase goods and services. The indirect purchases (indirect effects) continue until leakages from the region (imports, wages, profits) stop the cycle. The indirect effects and the effects of increased household spending (induced effects) are calculated as a set of multipliers. The multipliers describe the change of output for each industry caused by a one dollar change in final demand for any given industry.[3]

Once the positive and negative impacts have been determined and projected for each region involved in the interbasin transfers in questions, they are netted to determine the total positive or negative impact of each interbasin transfer considered.

3.2.3 Market Survey of Water Rights Transactions

The third leg of R.W. Beck's study, as requested by TWDB Staff, was designed to attempt to determine the effect, if any, the junior priority provision, as contained within Texas Water Code Section 11.085, has on the value of water rights. In an effort to quantify this difference, R.W. Beck's Project Team attempted to study water rights transactions which occurred under either of the following two scenarios.

1. Assuming the priority date of a water right changed as a result of a transaction, in other words, made junior to other existing water rights.
2. Assuming a water right maintained its original priority date after a transaction.

To obtain the necessary water right transaction information needed to conduct this analysis, R.W. Beck contacted the TCEQ and obtained information on water rights acquisitions that have occurred in the state. The transaction listings provided by TCEQ contained transactions occurring since April 2001. Additionally, TCEQ was also able to provide a database containing water rights that are connected with a current interbasin transfer, and whether those water rights are subject to the provisions of S.B. 1, and thus the junior priority provision.

To augment the information, R.W. Beck obtained issues of "Water Strategist" dating back to January 1999. "Water Strategist" as published by Stratecon,

[3] Olson, Doug and Scott Lindall, "Implan Professional Software, Analysis, and Data Guide, Minnesota IMPLAN Group, Inc.

Inc. provides information and analysis concerning marketing, legislation, litigation, and financial information of water resources.[4] Each issue of the "Water Strategist" contains information on current water rights transactions that have occurred in 17 western states. R.W. Beck reviewed each issue and compiled data concerning water transactions that have occurred within Texas.

Once compiled, R.W. Beck removed transactions that did not fit the criteria of the study. This included:

- Groundwater transactions;
- Water leases;
- Transaction in which only the name of the water right owner changed;
- Water right transactions that are currently in process; and
- Transactions that are currently contested.

Once all the data was compiled and filtered, R.W. Beck took a sample of the transactions contained on the list and attempted to contact the buyer and/or the seller in an effort to obtain information on the transaction. In constructing the sample, the Project Team focused on transactions that involved public entities, so as to obtain data that is already in the public domain. Once contacted, the buyer and/or seller were asked for the following information:

- The purchase price of the transaction;
- The acre-feet of water involved in the transaction;
- The priority date of the right; and
- Whether the right changed as a result of the transaction.

To gain additional information and insight as to the water market in Texas, R.W. Beck also contacted water marketing professionals throughout the State. These contacts included water marketers, lawyers, consultants, and educators in the state. These individuals provided valuable insight to the current state of the water market in Texas and the information they provided was essential in guiding R.W. Beck's analysis as well as our findings and conclusions.

Once the Project Team obtained information on each of the water rights transactions contained within our random sample, the results were compiled and analyzed to determine if a conclusion could be drawn based on available data and, if so, what could be garnered from the results of the survey. Our analysis is further discussed in Section 7 of this report.

[4] http://www.waterstrategist.com/body.html

Section 4
Bedias Reservoir Interbasin Transfer

4.1 Introduction and Background

The Bedias Reservoir Interbasin transfer has been considered as a potential water management strategy for Montgomery County, located in Planning Region H. According to regional planning documents, it is estimated that Montgomery County demand will begin to exceed its available supply by 2020. To meet this demand, it is proposed that the San Jacinto River Authority (SJRA) and / or the Trinity River Authority develop the Bedias Creek Reservoir, which would be located in the Trinity River Basin. SJRA would also construct a pipeline that would ultimately carry water from this reservoir to a tributary of the West Fork of the San Jacinto River, which ultimately flows into Lake Conroe. From Lake Conroe, these supplies could then be used to meet SJRA's northern and southern basin demands, specifically those within Montgomery County.

In the 1997 State Water Plan, it was stated that the San Jacinto River Authority had obtained 50,000 acre-feet of water supplies from the Trinity Basin via the Devers Canal. This supply was slated to be used to meet the needs of east Harris County, thereby freeing water in Lake Conroe for use in Montgomery County. The Plan noted the expected shortage in Montgomery County for the City of Conroe, and stated that the City should plan to use more water from Lake Conroe beginning in 2010, institute re-use by 2040, and contract with SJRA for a portion of Lake Houston water by 2050.

In the 2001 Region H Plan, the Lake Bedias to Lake Conroe Interbasin Transfer was first considered as a potential water management strategy. The Bedias reservoir and the associated interbasin transfer were recommended for implementation at this time.

In the 2006 Region H Plan, the development of the Bedias Reservoir and Interbasin Transfer to Lake Conroe was again considered as a potential water management strategy. In the 2006 plan, the need for interbasin transfers was emphasized within Region H. At that time, it was also stated, referring to the junior rights provision that "because reliability is partially based on the seniority of a water right, [the junior rights provision] in the water code makes new interbasin transfers difficult to accomplish."[1] While considered in 2006, the Bedias Reservoir and interbasin transfer were not recommended for implementation, but were maintained as an alternative water management strategy. In its place, it was recommended that the Luce Bayou Conveyance from the Trinity River to Lake Houston be pursued.

Based on conversations with representatives of both San Jacinto River Authority and Trinity River Authority, it appears that the Bedias Reservoir, and the associated

[1] 2006 Region H Water Plan, Page 4-6

interbasin transfer were never considered on more than a hypothetical basis. A Bureau of Reclamation Study was performed for the proposed Bedias Reservoir Site; however, according to Trinity River Authority, nothing more has been done beyond this initial planning stage. Additionally, according to a news article dated July 13, 2005, then San Jacinto River Authority General Manager Jim Adams told Madison County Commissioners that while the Bedias Reservoir was a quality site, due to a lack of anticipated water shortages, the Bedias Reservoir is now only being considered as an alternative management strategy.[2]

4.2 Cost Comparisons

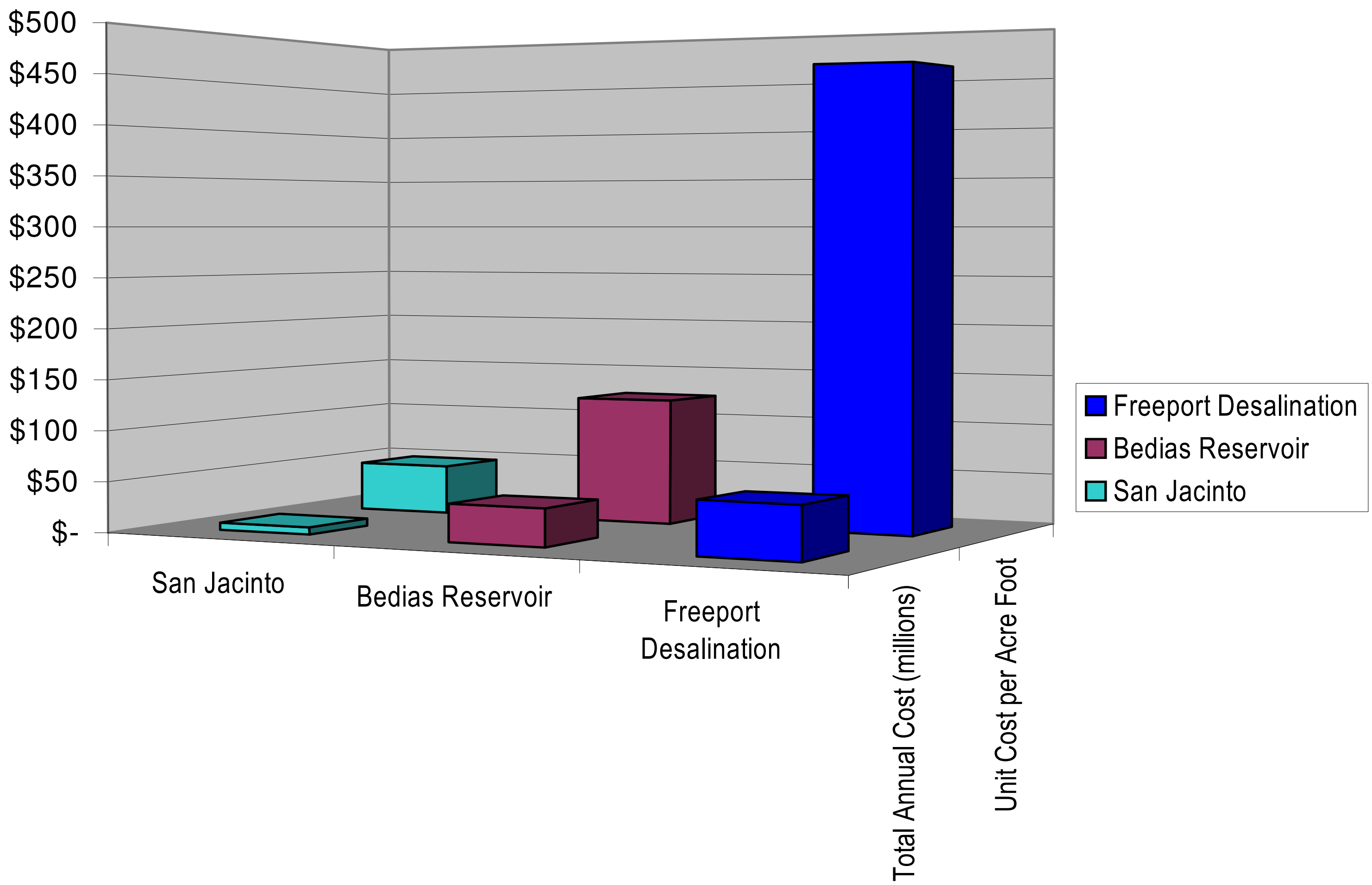
As requested by TWDB Staff, R.W. Beck's Project Team performed a cost comparison with two additional water management strategies. The goal of this analysis was to determine the cost effectiveness of the Bedias Reservoir Interbasin Transfer as compared with alternative water management strategies. Based upon the analysis performed, Table 4-1 summarizes the present cost per acre foot of each strategy. Figure 4-1 graphically illustrates the annual cost of each strategy as well as the present cost per acre foot.

Table 4-1
Present Cost per Acre-Foot Comparison of Bedias Reservoir Interbasin Transfer and Selected Alternative Strategies

Bedias Reservoir Interbasin Transfer	
Cost per Acre Foot	$ 125
Additional Contracted Water Supply from SJRA	
Cost per Acre Foot	$ 49
Freeport Desalination Project	
Cost per Acre Foot	$ 460

[2] Madisonville Meteor, July 13, 2005

Figure 4-1
Cost Comparison of Bedias Reservoir Interbasin Transfer and Selected Alternative Strategies



The information below briefly discusses the water management strategies chosen for comparison and the assumptions made by the Project Team in developing the cost comparisons.

4.2.1 Bedias Reservoir Interbasin Transfer

To develop the cost for the Bedias Reservoir Interbasin Transfer, R.W. Beck relied upon the technical memorandum concerning the project prepared by the Region H planning team as part of the 2006 regional water planning process. In performing this cost comparison, it was necessary to understand how the construction of the reservoir would be structured between the Basin of Origin, managed by the Trinity River Authority (TRA), and the Receiving Basin, managed by the San Jacinto River

Authority (SJRA). Conversations with representatives of both TRA and SJRA emphasized that the project was still conceptual; however, the most likely scenario would see the reservoir developed by TRA, with SJRA paying TRA for the complete cost of development. As an incentive for developing the reservoir, TRA would receive 30% of the firm yield of the reservoir and SJRA would receive 70%.

Working under this scenario, R.W. Beck assumed that SJRA would receive 63,490 acre-feet annually, or 70% of the estimated 90,700 acre-feet yield of the reservoir. In addition, SJRA would pay the full debt service and operations and maintenance cost associated with the reservoir as well as the full debt service and operations and maintenance cost associated with the planned conveyance system.

The technical memorandum prepared by Region H illustrated the cost of developing both the reservoir and the conveyance system in 2002 dollars. To escalate these costs into 2005 dollars, R.W. Beck utilized the Construction Cost Index published by Engineering News Record ("ENR"). In addition, to escalate the cost category of "Engineering, Financial & Legal Services, and Contingencies," R.W. Beck assumed that this cost would be equivalent to 30% of the pipeline costs and 35% of the pump station and stilling basin costs. Finally, to escalate the cost category of "Interest During Construction," the Project Team applied the same percentage used in 2002 to the updated 2005 construction cost total.

Once the costs for the Bedias to Lake Conroe Transfer were escalated, the Project Team further assumed that it would take 20 years to construct the associated reservoir and necessary conveyance facilities. As such, it was necessary to estimate the potential project cost in 2025. To project the cost of developing the reservoir, R.W. Beck applied the general inflation factor to the reservoir cost illustrated in Appendix B to Chapter 4 of the Region H Water Management Strategies report. After escalating the cost to year 2025 it was assumed that a debt instrument would be issued with a 30 year time period and a rate of 6% to pay for the construction cost of the reservoir. The conveyance system cost was escalated utilizing the ENR index.

Upon developing the assumed future cost of the project, R.W. Beck performed a present value cost analysis. This analysis assumed a 50 year time span beginning in 2005, with the project coming on-line in 2025. In performing this analysis, the operations and maintenance costs associated with the reservoir were escalated by an assumed inflation rate of 3% annually. The escalation in the estimated conveyance system annual operation and maintenance cost was derived using percentages given in the Bedias Cost Summary Region H report. The discount factor utilized in this analysis was equivalent to the 30-year nominal treasury interest rate in August 2006. Additionally, half year convention was utilized in performing the present value cost analysis beginning in mid-year 2005.

Table 4-2 illustrates the results of the present value cost analysis:

Table 4-2
Present Value Cost Analysis of Bedias Reservoir Interbasin Transfer

Total Present Value Cost	$ 237,219,187
Annual Acre-Foot Yield	63,490
Years of Operation in Analysis	30
Total Acre-Foot Yield	1,904,700
Present Value Cost per Acre-Foot	$ 125

4.2.2 Additional Contracted Supply from San Jacinto River Authority

A strategy adopted by the Region H water planning group that could supply a similar amount of water to Montgomery County as the Bedias Reservoir Interbasin Transfer would be new raw water contracts with the San Jacinto River Authority. This strategy is estimated to provide 96,000 of acre-feet annually.

However, in examining this project, it appears that in order to supply these new contracts, it will be necessary for San Jacinto River Authority to utilize new water supplies to free-up already contracted supplies. Based on our understanding of the Region H plan, these additional supplies would come from Lake Livingston, which is located in the Trinity River Basin. As this water is slated to be used in the San Jacinto River Basin, this would necessitate an interbasin transfer. While one of the key tenets of this study is to compare the cost of an interbasin transfer with the cost of a project that does not involve an interbasin transfer, the Project Team continued its examination of this strategy despite failing to achieve the desired comparison parameters.

In an effort to determine the cost of this water management strategy, R.W. Beck contacted representatives of the San Jacinto River Authority. Upon conversations with these representatives, it was noted that SJRA is currently undergoing a cost of service study to determine if adjustments to its current raw water system rate are necessary. The results of this study will not be available until after the first of the year. As such, developing the estimated unit cost of raw water at this time proved challenging. To provide an approximation, the Project Team requested information regarding current charges to water suppliers in Montgomery County. At present, SJRA supplies one entity in Montgomery County, The Woodlands Joint Powers Agency, with chlorinated groundwater. The current charge for this supply is $0.85 per 1,000 gallons.

As this supply does not represent raw water service to a retail water supplier exclusive of treatment and/or distribution, this rate was not considered for use in developing the cost comparison. As an alternative, R.W. Beck relied upon the estimated raw water system charge by SJRA, $75.00 per acre-foot, as contained in the 2001 Region H Plan.

This is in contrast to the $45.00 per acre-foot that is currently estimated for this particular water management strategy in the 2006 Region H Plan. R.W. Beck utilized the higher charge in recognition of the fact that an interbasin transfer is involved in this water management strategy, and that the retail water providers will most likely be asked to bear some portion of the interbasin transfer conveyance system costs.

The $75.00 per acre-foot was escalated at the general inflation rate of 3% and then applied to the discount factor previously discussed. Because it assumed in the Region H plan that the additional water could simply be contracted, R.W. Beck began the present value cost analysis in 2005. However, as previously mentioned, after further research it appears that this strategy will most likely be subject to an interbasin transfer and the conveyance system associated with that transfer, prolonging the estimated time until this water management strategy would feasibly come online.

Table 4-3
Present Value Cost Analysis of Additional Contracted Supply from San Jacinto River Authority

Total Present Value Cost	$ 233,493,267
Annual Acre-Foot Yield	96,000
Years of Operation in Analysis	50
Total Acre-Foot Yield	4,800,000
Present Value Cost per Acre-Foot	$ 49

4.2.3 Freeport Desalination Project

As discussed in the previous section, under current plans, it is not possible for SJRA to provide additional contracted water to Montgomery County without an interbasin transfer. To find a project that could deliver a similar quantity of water as the Bedias Reservoir Interbasin Transfer, and that does not involve an interbasin transfer, TWDB Staff suggested an examination of the Freeport Desalination Project. Because this project involves desalinated seawater, it is not subject to statutes governing interbasin transfers.

Currently, water from the potential Freeport Desalination Project is only slated for use in Brazoria County, located in the Brazos River Basin. Should the project be pursued and found to be successful, it was assumed that its use might be considered further inland, such as to meet the projected and potential need in Montgomery County. To consider this hypothetical scenario, R.W. Beck obtained the detailed technical memorandum on the project as contained in the 2005 Region H plan, as well as the final project report as prepared by CDM.

As previously mentioned, it is estimated that the Bedias Reservoir Interbasin Transfer will provide 63,490 acre-feet of water on an annual basis. For a desalination plant to provide this same quantity of water, it would need to be sized to produce at least 57

MGD. As part of the CDM report on the Freeport Project, the estimated capacity and commodity costs (i.e., unit cost of water produced) associated with providing desalinated seawater were prepared for a variety of scenarios including desalination plants rated at 50 and 100 MGD. To provide a comparison of the Bedias to Lake Conroe Transfer, R.W. Beck assumed the construction of a 50 MGD plant.

As part of the CDM report, detailed commodity and capacity cost data (i.e., unit cost of water) was only developed for the planned 10 MGD plant. Utilizing the data provided by CDM, R.W. Beck extrapolated this data to the assumed 50 MGD plant and developed a unit cost per 1,000 gallons for the following categories:

- Debt Service
- Chemicals
- Membrane Replacement
- Power
- Labor
- Maintenance
- Sludge Disposal
- Miscellaneous

Once extrapolated, this data, which was originally provided by CDM in 2004 dollars, was escalated to 2005 dollars. To perform this escalation, R.W. Beck utilized the following methods:

- Chemical costs were escalated utilizing the industrial chemicals category of the producer price index
- Membrane Replacement was escalated utilizing the change in Account 320 – Large Treatment Plant Equipment as illustrated in the Handy-Whitman Index of Public Utility Construction Costs for water utilities
- Power costs were escalated utilizing the industrial electrical power category of the producer price index
- Labor was escalated using the service providing industries – trade, transportation, and utilities category of the employment cost index
- Sludge Disposal and other miscellaneous costs were escalated assuming a general 3% inflation factor
- Debt Service was estimated at 6% for 30 years on the construction cost after it was applied ENR Construction Cost Index to escalate it to mid-year 2010

The developed unit cost of water was then applied to the same quantity of annual acre-feet that a 50 MGD plant is estimated to produce. It should be noted that while R.W. Beck considered the cost of a 50 MGD Plant, only 40 MGD would be available to meet the needs in Montgomery County, as 10 MGD is already committed to suppliers in Brazoria County. Additionally, this cost comparison only encompasses the cost of water as produced at a plant sized to produce 50 MGD. This analysis does not specifically identify the incremental cost associated with increasing the plant size from the currently planned 10 MGD plant to a 50 MGD plant, nor does this analysis consider the associated cost of the conveyance system needed to move the water to Montgomery County.

Once the costs for the Freeport Desalination Project were escalated, the Project Team further assumed that it would take 5 years to construct the plant and conveyance facilities. As such, it was necessary to estimate the potential project cost in 2010. To project the cost of constructing the water treatment plant and conveyance system, R.W. Beck applied the methodologies and indices previously discussed.

Upon developing the assumed future cost of the project, R.W. Beck performed a present value cost analysis. This analysis assumed a 50 year time span beginning in 2005, with the project coming on-line in 2010. In performing this analysis, the same indices used to escalate the cost from 2004 to 2005 were used as an annual inflation factor over the life of the project. As previously mentioned, the discount factor utilized in this analysis was equivalent to the 30-year nominal treasury interest rate in August 2006 of 5.0%.

Table 4-4 illustrates the results of the present value cost analysis

Table 4-4
Present Value Cost Analysis of the Freeport Desalination Project

Total Present Value Cost	$ 1,160,327,775
Annual Acre-Foot Yield	56,007
Years of Operation in Analysis	45
Total Acre-Foot Yield	2,520,324
Present Value Cost per Acre-Foot	$ 460

Again, it should be noted that R.W. Beck only compared the treatment cost of desalinated water as it is produced. This cost comparison does not take into account the cost associated with conveying this water to Montgomery County. As the present value cost per acre-foot for the Freeport Desalination Project is already over 2.5 times that of the Bedias to Lake Conroe Transfer, the additional conveyance facility cost would only increase this variance.

Appendix B, Schedule 1 illustrates the detailed cost comparison analysis and present value cost calculations for each water supply alternative discussed in section 4.2.

4.3 Socioeconomic Impact Analysis

The construction of the Bedias Reservoir and its conveyance system will create costs and benefits for both the areas in the Basin of Origin (Madison, Grimes and Walker Counties) and the Receiving Basin (Montgomery County). Table 4-5 below shows the net present worth analysis of these costs and benefits for the period from 2005 through 2045.

Table 4-5
Estimated Socioeconomic Impact of the Bedias Reservoir Interbasin Transfer

Impacts to the Basin of Origin	
Economic Costs	
Loss of Commerce (Farm Production)	$ 277,933,728
Loss of Agricultural Subsidies	1,585,717
Loss of Commerce (Forestry)	429,377,711
Subtotal	$ 708,897,156
Economic Benefits	
Construction of Lake (Local Payroll)	$ 401,473
Commerce from Lake Visitors	296,806,376
Commerce from New Residents	1,164,118,532
Subtotal	$ 1,461,326,381
Total Net Economic Impact to the Basin of Origin	**$ 752,429,225**
Impacts to the Receiving Basin	
Economic Benefits	
Construction of Lake (Local Payroll)	$ 3,602,603
Increased Commerce from New Residents	67,478,558,415
Total Net Economic Impact to the Receiving Basin	**$ 67,482,161,018**
Total Net Economic Impact of Bedias Reservoir Interbasin Transfer	**$ 68,234,590,243**

4.3.1 Basin of Origin-Impacts Due to Economic Losses

Loss of Commerce from Farm Production

The construction of the Reservoir (Lake) itself, and the residential and commercial development that is anticipated to occur around the Lake, will occupy acreage that is currently available for agricultural and forestry use. There are approximately 27,400 acres within the Lake's take-line, of which there are 7,300 acres of Bottomland Hardwood Forests, 7,000 acres of Post Oak-Elm-Hackberry Forests, and approximately 7,000 acres of grasslands. By assuming that the grasslands would eventually become Farmland, a ratio of Farmland (33%) and Forests (67%) can be calculated. Using these ratios, the 6,100 acres of Non Identified Land (from the original 27,400 acres of Land Impacted) can be allocated towards either Farmland (2,005 acres) or Forests (4,095 acres). Thus a total of 9,005 acres of land will be lost from agricultural production whereas 19,387 acres of forest will be unavailable for logging and other Forestry-related commerce. It is assumed that one-fourth of this acreage will be removed from agricultural use upon start of Lake property acquisition in 2010, one-half in 2011, three-fourths in 2012 and all the acreage within the Lake's take-line area will be removed from agricultural use from 2013 through the remainder of the analysis period.

The area available for development around the Lake is assumed to include all acreage within one-half (1/2) mile of the Lake's take-line. This development area includes approximately 58,991 acres. It is recognized that this acreage will be removed from agricultural and forestry use and developed over a period of several years. The impact of this development will be minimal initially, but will increase as land is removed from agricultural/forestry use and utilized for development. It is assumed that an annual loss of 2% of agricultural land to development will occur starting in 2015 upon completion of the construction of the Lake.

A study was published in 1990 by the Texas Parks and Wildlife Department entitled "An Assessment of Direct Impacts to Wildlife Habitat from Future Water Development Projects."[3] which lists projected impacts to wildlife from the proposed development of 44 Texas reservoirs. This report provides preliminary data on the land acquisition necessary to achieve full wildlife habitat compensation for unavoidable losses to wildlife resources. Over 851,000 acres of wildlife habitat would be directly impacted by the 44 reservoirs. The proposed Bedias Reservoir was included in this study, and the acreage suggested for mitigation by the study is shown in Table 4-6 below.

[3] Roy G. Frye and David Curtis, "Texas Water and Wildlife: An Assessment of Direct Impacts of Wildlife Habitat from Future Water Development Projects (Austin: TPWD, Resource Protection Division, 1990)

Table 4-6
Bedias Reservoir Estimated Mitigation

		Compensation Requirements		
Cover Type	Acres Lost	Maximum	Moderate	Minimum
Mixed Bottomland Hardwood Forest	7,328	87,238	43,968	21,984
Grasses, Parks	7,036	65,667	32,833	16,417
Post Oak – Elm – Hackberry Forest	6,851	70,741	35,236	16,718
Other	3,460			
Total	24,675	223,646	112,037	55,119

The acreage required for mitigation varies according to the management option selected (Minimum, Moderate, or Maximum). Since the study emphasizes that it does not represent the product of detailed analyses of potentially affected areas and is not intended to supplant environmental studies on individual projects, the Moderate management level was selected to project the mitigation acreage required. It is assumed that the land acquisition for the mitigation will mirror the timing of the construction of the Lake itself, with 25% of the mitigated land being purchased in a series of 4 years, beginning in 2010.

When analyzing the economic impacts of the land involved in the reservoir itself, the development within a half-mile of the Lake's perimeter, and the acreage required for wildlife habitat mitigation, the location within the impacted counties is calculated from the footprint of the Lake itself. For this analysis, the Lake is considered to be 51% in Madison County, 30% in Grimes County, and 19% in Walker County[4]. Details of these three affected counties' agricultural and forestry related commerce have been used to assess the overall economic impact of this land required for the Bedias Reservoir.

Farms within Madison County sold agricultural products with an estimated average market value of $271 per acre in 2005, while Walker County's agricultural products averaged $134 per acre and Grimes County's agricultural products averaged $84.[5] The market value per acre for agricultural products sold was applied to the acreage (approximately 9,005 acres) of farmland lost due to the Lake's construction, resulting in an annual impact loss of $1,698,394 in 2005 dollars, and to the farmland acreage within the development area (approximately 19,387 acres), resulting in an annual impact of $3,656,542 in 2005 dollars. The annual impact for the land required for

[4] Footprint of Bedias Reservoir assumed from 2006 Region H Water Planning Documents
[5] U.S. Department of Agriculture 2002 Census of Agriculture, escalated to 2005 by assuming 3% inflation.

mitigation is $6,192,698. These costs and their allocation to the three affected counties are shown on Appendix B, Schedule 2, Page 17.[6]

The market values for the Counties' farmland commerce per acre represent the gross revenues generated by farms. Since this represents the gross revenue generated and not the net income of the farms, gross revenue incorporates more than the lost income to the farm owner. For example, gross revenue would be available for payments that include, but are not limited to, farm supplies and supplements purchased within the County, wages paid to farm laborers residing within the County, and property taxes.

In order to recognize the multiplicative effect of the loss of agricultural commerce, IMPLAN software has been used to calculate multiplier effects on the three Counties' economies. Including the multiplier effects, total economic losses total $277,933,728 annually in 2005 dollars with the removal of 61,224 acres from agricultural use.

Loss of Income from Farm and Ranch Subsidies

In addition to the loss of commerce due to loss of product sales from the acreage removed from agricultural use, there is also a loss of income currently received as government subsidies for this same acreage. USDA subsidies to Grimes, Madison and Walker County farms from 1995 to 2004 ranged from a low of $99,969 in 1998 to a high of $2,302,479 in 1999. The average annual USDA subsidy over this period was $294,069 for Madison County, $467,852 for Grimes County, and $184,346 for Walker County (all in 2005 dollars)[7]. The USDA subsidy per acre can be determined for each County by dividing these average subsidies by the total farm acreage per County.[8] Madison County received $1.20 per acre in government subsidies while Grimes County received $1.13 per acre and Walker County received $0.67 per acre in subsidies. The subsidy revenues lost due to the removal of approximately 9,005 acres of agricultural land within the Lake's take-line area, removal of approximately 19,387 acres of agricultural land within the development area, and revenues lost from the removal of 32,833 acres for wildlife mitigation are estimated to be $9,708, $20,900, and $35,397, respectively as shown on Appendix B, Schedule 2, Page 18. As with the "Loss of Commerce from Farm and Ranch Production", it is assumed that one-fourth of the 9,005 acres within the Lake's take-line combined with the 32,833 acres required for mitigation will be removed from agricultural use upon start of Lake property acquisition in 2010, one-half in 2011, three-fourths in 2012 and all the acreage within the Lake's take-line area will be removed from agricultural use by 2013. Also, for the 19,387 acres within the development area, it is assumed an annual loss of 1% of agricultural land to development will occur starting in 2015 with the completion of the construction of the Lake.

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[6] For purposes of this analysis, all dollar values determined in a particular year were escalated by an annual inflation rate of 3% to the appropriate years under consideration within each element of the analysis.

[7] Environmental Working Group Farm Subsidy Database

[8] Total farm acreage in 2002, www.nass.usda.gov/census02

Loss of Income from Forestry Production

In addition to the loss of farmland commerce, income currently received from forestry production will also be precluded from use due to the Bedias Reservoir construction. Of the 27,400 impacted acres, 7,300 acres are classified as Bottomland Hardwoods while 7,000 acres are Post Oak-Elm-Hackberry Forests. Of the 6,100 acres that were not identified specifically, 4,095 acres have been assigned to forests through a proportional allocation, for a total of 18,395 acres of forests being removed within the Lake's take line. Using the same allocation procedures as utilized in the farmland analysis, it was estimated that 39,604 acres will be removed from production by the lakeside development and 79,204 acres of forests will be removed as required for mitigation.

The market values for the forestry impact have been determined by utilizing the 2005 statistics for Walker County only. Currently, 50% of Walker County's accessible forests are utilized for forestry production. Grimes County currently generates less than 10% ($1,487,000) of the revenue that Walker County generates ($26,011,000) from Forestry related production, while Madison County generates less than 2% ($288,000) of Walker County's revenue from forestry products.[9] Table 4-7 below demonstrates these variances between counties, but it should be noted that the "Accessible Forest" measurement is not the value required to determine a reasonable market value of forestry products per acre. Instead, the acreage ***used*** in forestry production, not all available forests, is required. Walker County's Extension Office has captured that information, demonstrating that in 2005, Walker County generated $25 million dollars from 164,443 acres. As information could not be obtained for all three counties individually, R.W. Beck used the information from Walker County to estimate a value per acre ($152.03), which is then used to forecast the commerce lost in all three (3) counties due to the construction of the Bedias Reservoir.

Table 4-7
Forestry Information for Bedias Reservoir Interbasin Transfer Basin of Origin Counties

	Madison	Grimes	Walker
Value of Harvest	$ 288,000	$ 1,487,000	$ 26,011,000
Accessible Forest (acres)	82,080	146,196	328,667

The assumptions utilized in timing the loss of commerce from forestry production are the same as that used in calculating the farming commerce and agricultural subsidy losses, with the exception of Madison County. For this County, R.W. Beck has assumed a 10 year lag to acknowledge Madison County's relatively slow development of forestry production.[10] As utilized in determining the economic impact from lost commerce from farm production, the acreage within the Lake and set aside for

[9] Forestry Inventory Mapmaker, National Information Management System (NIMS-CS), 2005.
[10] Walker and Grimes Counties experiences losses beginning in year 2010 while Madison experiences losses beginning in year 2020.

mitigation efforts will be phased in over a four year period. Likewise, the acreage lost from forestry production due to lake development is escalated by 2% annually.

4.3.2 Basin of Origin-Benefits to the Basin

Short-Term Benefits

Direct Construction Benefit (Payroll)

The construction cost of the Lake is estimated at $142,690,000, and the construction cost of the conveyance system is estimated to be $72,429,804.[11] The payroll for local construction workers is estimated to be approximately 15% ($32,267,971 in 2002 dollars) of the construction costs as shown on Appendix B, Schedule 2, Page 20.[12] To calculate the total short term benefits resulting from the Lake's construction, the following approach has been utilized.

In considering the local construction efforts related to the Lake and conveyance system, the economic influence of Harris County should be taken into account so as not to overstate the economic benefit to the Basin of Origin and Receiving Basin. As such, the $75 million local payroll and construction materials are assumed to be distributed between five counties (Madison, Grimes, Walker, Montgomery and Harris Counties), in the same proportion of their populations. The local payroll and construction materials associated with Harris County is excluded from the analysis as it lies outside the Basin of Origin and the Receiving Basin, while the benefits associated with Montgomery County are accounted for as economic benefits to the Receiving Basin.

The information obtained from the IMPLAN software demonstrates that the three counties, although similar, have slightly different economic characteristics. Disposable income in Madison County, Grimes County, and Walker County is estimated to be 88.4%, 90.0% and 86.0%, respectively.[13] Residents in Madison County buy 45.0% of products from local sources and spend 55.0% on goods imported from outside Madison County. Grimes and Walker County residents spend 42.2% and 51.5% of disposable income locally, respectively. The multiplier effects for spending in Madison, Grimes, and Walker Counties is 1.16, 1.16, and 1.21, respectively. These differences result in a total economic benefit for all three counties in the Basin of Origin of $401,473.[14] The estimated physical construction of the Lake is assumed during the years 2010 through 2014. For purposes of this analysis, it is also assumed that one-fifth of the construction dollars will be spent in each of these years.

[11] Texas Water Development Board, 2006 Regional Water Plan, Region H.
[12] RS Means Manuals
[13] Olson, Doug and Scott Lindall, "IMPLAN Professional Software, Analysis, and Data Guide"; Minnesota IMPLAN Group, Inc.
[14] Ibid

Long-Term Benefits

The Fort Worth District of the US Army Corps of Engineers (USACE) publishes selected data related to visitors and employment at the USACE-operated lakes within Texas.[15] Data from selected USACE lakes was used as the basis for projecting some of the long-term benefits of the Lake construction. The two lakes chosen for comparison were similar in size, and/or similar in location (especially concerning their relative location to Galveston). For purposes of these benefit projections, the data from Addicks Dam and Somerville Lake were used.

Commerce from Lake Visitors

Based on the data from the selected USACE lakes noted above, an average of approximately 1,565,950 visitors can be expected annually.[16] The average spending for a visitor at these selected lakes is $14.59 per visit, less 6.25% sales tax (State's sales tax rate), resulting in actual spending of $13.73 per visitor.[17] Some of this visitor spending at the Lake will not be from new economic sources, but will come from existing Basin residents. The estimated portion of annual visitor commerce from Basin of Origin residents ($748,421 in 1999 dollars), based on visitor survey data of a state park on one of the USACE lakes used for comparison (Somerville State Park) from Texas A&M Recreation, Park & Tourism Sciences, was removed from total annual visitor commerce.[18] Based upon average spending, average number of visitors at these selected lakes, and the removal of existing local resident spending, the total annual commerce from non-local visitors at Bedias Reservoir is estimated as $20,752,073 in 1999 dollars as shown on Appendix B, Schedule 2, Page 21.[19] This visitor commerce will create additional activity among supplying industries. The multiplier for these activities has been calculated utilizing IMPLAN as 1.16 for Madison and Grimes Counties and 1.21 for Walker County and applied to the estimated non-local visitor annual commerce. It is also assumed that the number of visitors to the Lake will initially be 5% of the estimated annual visitors starting in 2025 and increasing at 5% annually over the next twenty years.

Employment for Lake-Related Activities

Two forms of employment will develop from lake-related activities, direct employment and indirect employment. Direct employment consists of employment directly related to supporting lake-related activities, which may include lake operations personnel and employees at such establishments as marinas, bait and tackle shops, gas stations, cabins and motels, etc. Indirect employment is a result of a

[15] U.S. Army Engineer Research and Development Center, Expenditures and Associated Economic Effects of Recreation Visitors to Corps of Engineers Projects, Technical Report, 2003 (Data from 1999)
[16] Ibid
[17] Ibid
[18] Texas A&M Recreation, Park & Tourism Sciences survey results
[19] For purposes of this analysis, all dollar values determined in a particular year were escalated by an annual inflation rate of 3% to the appropriate years under consideration within each element of the analysis.

"spillover" or "leakage" of local spending on lake-related activities. As the economic support for this employment will come from lake visitors, the economic benefits associated with this employment are directly embedded within the economic benefit from lake visitors.

Commerce from New Residents

The potential development area within one-half (1/2) mile of the Lake's take-line has been defined as approximately 19,387 acres. Development in close proximity to the Lake is anticipated to be on one acre to one-half acre parcels. Development at a greater distance from the Lake is anticipated to be on larger parcels. For the purposes of estimating the number of new residents in the development area, it is assumed that the average development parcel will be 2.0 acres in size, and that there will be an average of 2.5 people per parcel at full development. Based on these assumptions, it is estimated that the population of the area could increase by approximately 76,688. However, a large part of the development will attract "weekend" residents and not "full-time" residents. Therefore, a population equivalent was calculated based upon 25% of the increased population being full-time residents with the remaining population projection reduced by a factor of 2/7 (2 days per week at the residence). The calculated population equivalent is approximately 35,600, and will be used as the basis for estimating increased spending from new residents.

The per capita income for Madison, Grimes, and Walker County residents for 2003, and as shown on the table below, was $21,322, $18,712 and $17,839, respectively.[20] Using the portion of disposable income spent locally and estimated multiplier effects as calculated using IMPLAN, commerce from new residents would result in a total economic benefit of $1,164,118,532 (in 2005 dollars) assuming a population equivalent of 35,600. It is recognized that this annual increase in commerce will not be realized immediately, but will occur incrementally over an extended period; therefore, an assumption of an annual incremental increase of 2% is used, beginning in 2025 with the filling of the Lake. However, there is a possibility that there could be an overlap of the benefits identified from Commerce from Lake Visitors with the benefits from Commerce from New Residents. Therefore, in order to prevent a potential overstatement in benefits to the Basin of Origin, Commerce from New Residents was conservatively estimated by reducing the net present value benefits of Commerce from New Residents by the net present value benefits of Commerce from Lake Visitors.

[20] Olson, Doug and Scott Lindall, "IMPLAN Professional Software, Analysis, and Data Guide"; Minnesota IMPLAN Group, Inc.

Table 4-8
Per Capita Income Assumptions and Economic Factors for Bedias Reservoir Interbasin Transfer Basin of Origin Counties

	Madison	Grimes	Walker
Per Capita Income	$ 21,322	$1 8,712	$ 17,839
% disposable	88.4 %	89.9 %	85.9 %
% locally spent	45.0 %	42.2 %	51.5 %
Subtotal	$ 11,403	$ 9,683	$ 9,520
Multiplier	1.16	1.16	1.21
Per Capita Economic Benefit	$ 15,167	$ 11,716	$ 12,281

In addition, it should be noted that, as a conservative measure, the three Counties' disposable income was assumed for all new residents. It is likely that many of the weekend residents will continue to work in localities where disposable incomes are higher than these Counties', which would allow for higher levels of spending in the Basin of Origin, consequently increasing the economic benefit.

Construction-related Benefits from New Housing
There are related benefits to the Basin of Origin due to the construction activities associated with new housing that will be built as a result of the Lake's construction. However, due to the uncertainty of the economic activity, and in order to conservatively estimate the total benefits to the Basin of Origin, there was no attempt to quantify these housing construction related benefits.

4.3.3 Receiving Basin - Benefits to the Basin

Increased Commerce from New Residents

It is assumed that the increased water supply to Montgomery County will support an incremental population increase beginning in 2025. To project the population that the additional water would support, TWDB Regional Water Plan demand projections were employed. The incremental water, provided annually to Montgomery County, was divided by the appropriate TWDB demand projections, to arrive at the estimated total project increase in population of 508,209. Additionally, to conservatively estimate the increase in population supported by the additional water supply, 20% of the water slated to be delivered was assumed to be lost and unaccounted for.

The economic impact on the local economy has been estimated by multiplying the per capita income of $32,068 (in 2003 dollars) for Montgomery County residents by the Montgomery County disposable income factor of 83.5% to get the disposable income per capita.[21] The population in Montgomery County buys 56.8% of its products from local sources and spends 43.2% on goods imported from outside Montgomery County, resulting in total disposable income per capita spent locally of $15,208. The multiplier effect for household spending in Montgomery County is 1.36, resulting in an economic benefit per capita of $20,733. Based on these assumptions, the total present value economic benefit from increased commerce from new residents in the Receiving Basin is estimated at $67,478,558,415.

Appendix B, Schedule 2 illustrates the detailed socioeconomic analysis and present value calculations as discussed in section 4.3.

[21] Olson, Doug and Scott Lindall, "IMPLAN Professional Software, Analysis, and Data Guide"; Minnesota IMPLAN Group, Inc.

4.4 Findings and Conclusions

Based on the above analysis, R.W. Beck offers the following findings and conclusions:

1. Out of the two water supply alternatives chosen for analysis, the Bedias Reservoir Interbasin Transfer costs less on a per unit basis than the Freeport Desalination Project, but significantly more than contracted water supplied by SJRA. These differences are driven by the significant cost of desalination and the construction cost associated with the Bedias Reservoir. It should be noted that R.W. Beck assumed that SJRA would only receive 70% of the total yield of the Bedias Reservoir. While regional planning documents indicated SJRA would receive either the full yield or 85% of the full yield of the reservoir, conversations with representatives of TRA indicated that this percentage could be as low as 70%. In order to produce a conservative estimate of the per unit cost of the project, the Project Team assumed that 70% of the yield will be received by SJRA. However, should SJRA receive more water from the Bedias Reservoir, the unit cost of water will decrease, possibly making this strategy more competitive with contracted water from SJRA.

   However, no matter how competitive these two water strategies may be, based on the Project Team's understanding of the current Region L plan, an interbasin transfer will be necessary to supply this additional contracted water or to free up already contracted supplies. R.W. Beck's cost comparison assumes $75 per acre/foot for these additional contracted supplies. However, the Project Team was unable to determine how this planning number was developed. If this assumed rate does not take into account the additional costs associated with the interbasin transfer of water, then the unit cost of the additional contracted supplies from SJRA may be higher, making it more competitive with the Bedias Reservoir Interbasin Transfer. In sum, this situation, at minimum, demonstrates the importance of interbasin transfers and the extent of their reliance in the regional planning process.

2. While this water management strategy is no longer being pursued as a recommended strategy by the regional planning group, should it be necessary to meet future needs, the Bedias Reservoir Interbasin Transfer carries with it a significant economic benefit. Based upon the Project Team's analysis, it is estimated that the net economic benefit to the Basin of Origin would be approximately $752 million while the net economic benefit to the Receiving Basin would be approximately $67 billion. It is the opinion of the Project Team that both basins would see significant economic benefit from the implementation of this strategy. As conservative estimates were used during the analysis, and several short-term benefits were not quantified due to uncertainty, it is possible that the total economic benefit of the project would be higher.

   While economic benefits will accrue to the Basin of Origin and the Receiving Basin, there are economic costs to the Basin of Origin. The Project Team estimates that just under $709 million in economic losses will accrue to the Basin of Origin. While this loss is more than offset by the projected economic benefits, these losses must be noted by policymakers. Additionally, the social losses due to the environmental impact of the reservoir, which could not be quantified, must also be considered. While the economic benefits of this project would support its implementation, other priorities and competing objectives may need to be considered.

3. It is the conclusion of the Project Team that the junior priority provision did not play a role in the regional planning group's decision not to pursue the Bedias Reservoir Interbasin Transfer. As this would be a new reservoir and a new water right appropriation, the only manner in which the junior priority provision would affect this particular project is in the sizing of the reservoir. When the reservoir is built, it would need to be large enough to accommodate all down stream water rights during the drought of record while still maintaining the yield contracted to SJRA.

   It is the Project Team's belief that the key factors which lead the regional planning group to consider this solely as a long-term strategy include:

   - The cost associated with building the reservoir and conveyance system;
   - The environmental impact of building this new reservoir; and
   - The failure of the projected water needs to be realized.

5.1 Introduction and Background

The Toledo Bend Reservoir is the largest man-made body of water in the South and the fifth largest in the United States in terms of surface acreage.[1] It is also the nation's only public water conservation and hydroelectric power project undertaken without federal participation in its permanent financing. The Reservoir has a controlled storage capacity of 4.477 million acre-feet or 1.448 trillion gallons of water.

The Toledo Bend Reservoir was originally constructed by the Sabine River Authority (SRA) of Texas and the Sabine River authority of Louisiana for the purposes of hydroelectric power generation, and recreation. There is approximately 1.5 million acre-feet of water permitted in the Toledo Bend Reservoir, of which 1 million acre-feet is allocated as Texas' share. The Sabine River Authority of Texas holds approximately 750,000 acre-feet of water in the Toledo Bend Reservoir.

The transfer of water from the Toledo Bend reservoir to the Region C water planning group was not considered as a potential water management strategy in the 1997 Water State Plan or the 2001 Regional Water Plan. The 2006 Region C plan did consider this as a feasible long-term supply option, indicating that the maximum supply that could be obtained from the Toledo Bend transfer for use in Region C is 600,000 acre-feet per year.

Several parties are currently pursuing this potential interbasin transfer including the Sabine River Authority of Texas (SRA), Tarrant Regional Water District (TRWD), Dallas Water Utilities (DWU), and North Texas Municipal Water District (NTMWD). Several engineering and financial feasibility studies have been conducted regarding this potential interbasin transfer; however, to date, no specific action has been taken.

5.2 Cost Comparisons

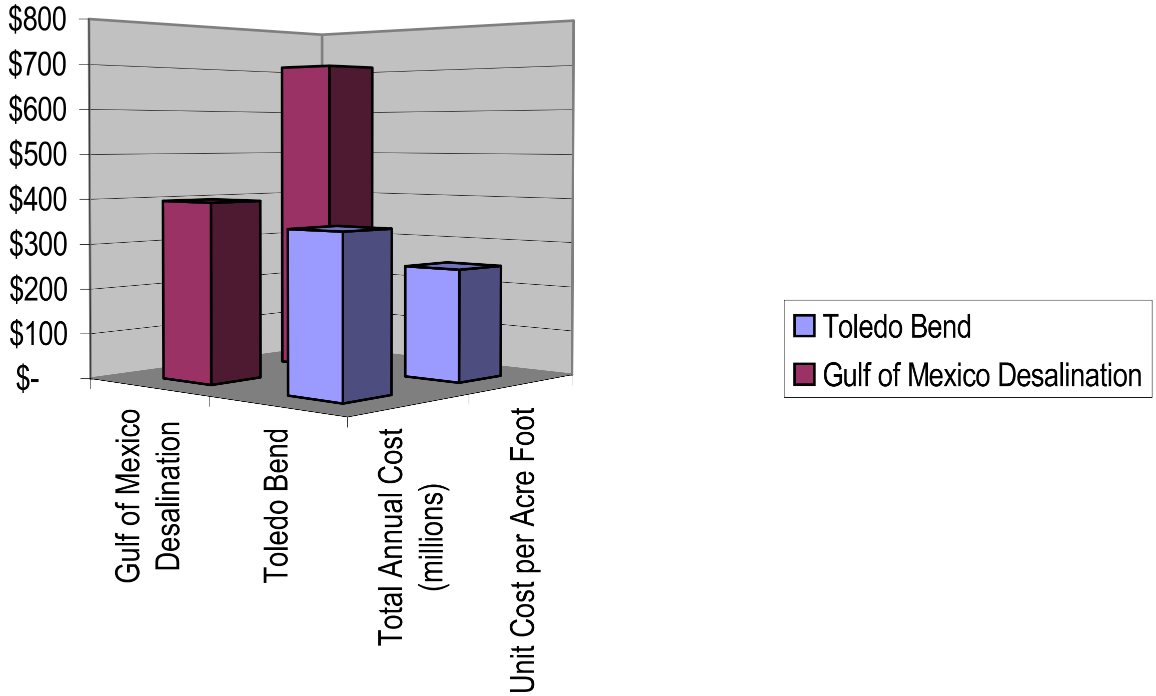
As requested by TWDB Staff, R.W. Beck's Project Team performed a cost comparison between the Toledo Bend Interbasin Transfer and an alternative water management strategy, desalinated seawater from the Gulf of Mexico. Based upon the analysis performed, Table 5-1 summarizes the present cost per acre foot of each strategy. Figure 5-1 graphically illustrates the annual cost of each strategy as well as the present cost per acre foot.

[1] http://www.sra.dst.tx.us/projects/tbp.asp

Table 5-1
Present Cost per Acre-Foot Comparison of Toledo Bend Interbasin Transfer and Selected Alternative Strategies

Toledo Bend Interbasin Transfer	
Cost per Acre Foot	$ 249
Seawater Desalination	
Cost per Acre Foot	$ 705

Figure 5-1
Cost Comparison of Toledo Bend Interbasin Transfer and Selected Alternative Strategies



5.2.1 Toledo Bend Reservoir Interbasin Transfer

Currently, TRWD, DWU, and NTMWD are all slated to each receive 200,000 acre-feet of water from the Toledo Bend Interbasin Transfer according to Cost Estimate U-17 in the 2006 TWDB Region C report. While the cost for the project will be shared by these three entities, the total project cost and yield have been considered for comparative purposes.

In performing this comparison the Project Team reviewed and relied upon information contained in the Region C plan. This data, provided in 2002 dollars, was first escalated to 2005 dollars. All capital costs were escalated utilizing the Construction

Cost Index History as published by Engineering News Record (ENR). Costs associated with right-of-way easements for the transmission pipelines were calculated at 30% of the escalated transmission pipeline costs excluding permitting and mitigation. Engineering and Contingency costs were calculated at 30% of the escalated pipeline costs and/or 35% of all storage tank costs, excluding permitting and mitigation, as described in Exhibit B of the TWDB planning guidelines. All other Non-capital costs were escalated utilizing the same percentage they reflected of capital costs in 2002.

All annual costs (i.e., operation and maintenance costs) were calculated utilizing U-3 Assumptions for Annual Costs from the 2006 Region C Plan.

Once the costs for the Toledo Bend Project were escalated, the Project Team further assumed that it would take 3 years to construct the necessary conveyance facilities. As such, it was necessary to estimate the potential project cost in 2008. To project the cost of constructing the conveyance system, R.W. Beck utilized the historical average of the ENR index on all costs excluding engineering and contingencies. Engineering and contingencies were calculated by applying the identical percentages that were used to escalate the expenditures from 2002 to 2005 as discussed above.

Upon developing the assumed future cost of the project, R.W. Beck performed a present value cost analysis. This analysis assumed a 50 year time span beginning in 2005, with the project coming on-line in 2008. In performing this analysis, the same indices used to escalate the cost from 2005 to 2008 were used as an annual inflation factor over the life of the project. The discount factor utilized in this analysis was equivalent to the 30-year nominal treasury interest rate in August 2006.

Table 5-2 illustrates the results of the present value cost analysis of the project:

Table 5-2
Present Value Cost Analysis of Toledo Bend Interbasin Transfer

Total Present Value Cost	$7,008,550,245
Annual Acre-Foot Yield	600,000
Years of Operation in Analysis	47
Total Acre-Foot Yield	28,200,000
Present Value Cost per Acre-Foot	$249

5.2.2 Seawater Desalination

As requested by TWDB Staff, R.W. Beck compared the Toledo Bend Interbasin Transfer to Desalinated Water from the Gulf of Mexico. While this was not adopted in the 2001 or 2006 regional plans, it does remain a long-term option to meet projected needs in Region C and represents the only potential strategy that is not an interbasin transfer that could yield the same or similar amount of water as the Toledo Bend transfer to a single wholesale supplier.

It should be noted that the Toledo Bend cost estimate analyzed in this study is scheduled to deliver 200,000 acre-feet of water to three (3) wholesale suppliers, for a total yield of 600,000 acre-feet delivered to Region C annually. On the other hand, the seawater desalination strategy is only slated to deliver 200,000 acre-feet annually. The resulting difference of 400,000 acre-feet delivered annually is the foremost contributing factor which results in a similar annual cost but differing unit cost between the two projects. In other words, the treatment and conveyance cost associated with desalination is approximately three times that of the Toledo Bend Transfer, but this increased treatment cost creates a supply which approximates a third of the total yield of the Toledo Bend Interbasin Transfer.

In performing this comparison, the Project Team first escalated the costs contained in the Region C plan from 2002 to 2005 dollars. All capital costs were escalated utilizing the Construction Cost Index History as published by ENR. Engineering and Contingency costs were calculated at 30% of the escalated pipeline costs and or 35% of all pump station costs, excluding right of way easements. Engineering and Contingency costs associated with the water treatment facilities were calculated by applying 35% to the capital cost of the treatment plant as described by TWDB Exhibit B. All other non-capital costs were calculated by assuming the same percentage of total capital cost after escalation.

Costs described in U-2 Assumptions for Capital Cost in the Region C Plan associated with right of way easements for the transmission pipelines were escalated applying a 3% inflation factor. After escalation, the said cost per acre described in the Region C Plan was applied to the calculated number of rural and urban acres used in the Gulf of Mexico Desalination cost estimate.

All annual costs (i.e., operation and maintenance costs) were calculated utilizing U-3 Assumptions for Annual Costs from the 2006 Region C Plan. Electricity costs were escalated using the Industrial Electrical Power Category of the Producer Price Index. The costs associated with water treatment were escalated based upon the increase in Account 320 – Large Treatment Plant Equipment as illustrated in the Handy-Whitman Index of Public Utility Construction Costs for water utilities. Per conversations with representatives from Freese and Nichols Ft. Worth Office, reject water disposal cost was held constant at $0.05 per 1,000 gallons of treated water.

Once the costs for the desalinated seawater project were escalated, the Project Team further assumed that it would take 5 years to construct the necessary treatment and conveyance facilities. As such, it was necessary to estimate the potential project cost in 2010. To project the cost of developing the treatment plant and conveyance system, R.W. Beck applied the identical indices used to escalate the costs from 2002 to 2005 dollars.

Upon developing the assumed future cost of the project, R.W. Beck performed a present value cost analysis. This analysis assumed a 50-year time span beginning in 2005, with the project coming on-line in 2010. In performing this analysis, the same indices used to escalate the cost from 2002 to 2010 were used as an annual inflation factor over the life of the project. In determining the present value cost, the discount factor utilized was equivalent to the 30-year nominal treasury interest rate in August 2006.

Table 5-3 illustrates the results of the present value cost analysis of the project

Table 5-3
Present Value Cost Analysis of Desalinated Seawater for Region C

Total Present Value Cost	$6,341,778,112
Annual Acre-Foot Yield	200,000
Years of Operation in Analysis	45
Total Acre-Foot Yield	9,000,000
Present Value Cost per Acre-Foot	$705

Appendix C, Schedule 1 illustrates the detailed cost comparison analysis and present value cost calculations for each water supply alternative discussed in section 5.2.

5.3 Socioeconomic Impact Analysis

As previously mentioned SRA, DWU, TRWD, and NTWDM, hereafter referred to as the Toledo Bend Group, are currently pursuing the Toledo Bend Interbasin Transfer as a long-term water supply strategy. As requested by TWDB, R.W. Beck performed a socioeconomic analysis of this proposed interbasin transfer. In conducting the socioeconomic impact of this transfer, R.W. Beck's Project Team considered both the costs (negative impacts) and benefits (positive impacts) to the Basin of Origin and the Receiving Basin. In developing this analysis, it was understood that there would be both long-term and short-term benefits to the Basin of Origin, in this case, SRA. Short-term benefits will occur as a result of the construction of the Toledo Bend Pipeline, and will increase the total benefits of the proposed project. Such short-term benefits will likely include, but will not be limited to, increased commerce from local construction payroll and direct purchase of construction materials from local venders. As the Toledo Bend Project is still in the planning stages, and to conservatively estimate the impact of the proposed project, no attempt was made to quantify the short-term benefits that will accrue as a result of the project.

Table 5-4 below shows the estimated net present worth analysis of the economic costs and benefits associated with the Toledo Bend Interbasin Transfer for the period from 2005 through 2045.

Table 5-4
Estimated Socioeconomic Impact of the Toledo Bend Interbasin Transfer

Impacts to the Basin of Origin	
Economic Benefits	
Commerce from New Residents	$ 10,439,527,592
Economic Development	110,839,376
Subtotal	$ 10,550,366,968
Total Net Economic Impact to the Basin of Origin	$ 10,550,366,968
Impacts to the Receiving Basin	
Economic Benefits	
Increased Commerce from New Residents	$ 1,300,687,942,173
Total Net Economic Impact to the Receiving Basin	$ 1,300,687,942,173
Total Net Economic Impact of Bedias Reservoir Interbasin Transfer	$ 1,311,238,309,142

5.3.1 Economic Benefits to the Basin of Origin (SRA)

Increased Commerce from New Residents

Construction of the Toledo Bend Pipeline will allow SRA to expand water provision within its service area. This provision of water will support additional residents, which will increase economic activity through new commerce. For the purposes of estimating the number of new residents this additional water will support, it is assumed that SRA will receive 100,000 acre-feet of water from the project.[2] It is further assumed that 80% of this water will be delivered to Harrison County, 10% to Rusk County, and 10% to Wood County.[3] In order to conservatively estimate the amount of water to be delivered within the service area, it was further assumed that 12% of the water would be lost and unaccounted for.

It was also assumed that the economic benefit to SRA of the annual population increase would be equivalent to the portion of per capita, disposable income[4] that is locally spent[5] by each new resident in their respective county of origin. Disposable income is commonly defined as the income left for individuals to spend after taxes.

[2] Freese & Nichols Technical Plan, December 2003
[3] SRA Comprehensive Sabine Watershed Management Plan, December 1999.
[4] Olson, Doug, and Scott Lindall, "IMPLAN Professional Software, Analysis, and Data Guide"; Minnesota IMPLAN Group, Inc.
[5] Ibid

This income, spent locally by residents, has a multiplicative effect in the local economy. Using IMPLAN, the estimated multipliers can be calculated and applied to determine an estimate of the economic impact each additional resident will have to their respective county. Table 5-5 below illustrates the per capita income assumption for each county, as well as the percentage of that income that is disposable and then spent in the local economy, and the multiplier effect of that spending.

Table 5-5
Per Capita Income Assumptions and Economic Factors for Toledo Bend Interbasin Transfer Basin of Origin Counties

	Harrison	Rusk	Wood
Per Capita Income	$24,053	$22,698	$20,804
% disposable	89.7%	91.6%	94.3%
% locally spent	52.8%	46.6%	48.5%
	$11,403	$9,683	$9,520
Multiplier	1.33	1.21	1.29
Economic Benefit	$15,167	$11,711	$12,253

Based on the estimated economic benefits of each new resident and the projected population increase, the total present value of the economic benefits to SRA created by commerce from new residents is represented on Appendix C, Schedule 2, Page 1 and is estimated as follows:

Table 5-6
Estimated Economic Benefit to Toledo Bend Interbasin Transfer Basin of Origin from New Residents

Harrison	$ 5,665,848,006
Rusk	2,818,769,202
Wood	1,954,910,384
Total Economic Benefit from New Residents	$ 10,439,527,592

Economic Development

As SRA is responsible for the maintenance and operation of the Toledo Bend Reservoir, it will be compensated based on its water provision to DWU, NTMWD, and TRWD. While there has been dialogue between the parties concerning the level of compensation to SRA, no firm numbers have been developed. As of 2004, the parties had contemplated that an annual maintenance fee and interbasin transfer fee will be paid to SRA by the aforementioned entities.[6] In this analysis, R.W. Beck has included a projection of SRA's compensation based upon previous assumptions;

[6] Toledo Bend Water Supply Project, Memorandum of Understanding, December 2004.

however, the parties have not agreed to these numbers and they are presented herein as estimates only.

Based on conversations with SRA officials, it is assumed that a portion of this additional revenue will be used for economic development grants within the SRA service area. It should be recognized that this will be an incremental source of revenue, based on the actual water delivered to DWU, NTMWD, and TRWD as well as the maintenance of a balanced budget by SRA.

To determine the economic benefit of the payments to SRA, the projected payments to SRA were calculated based on the unexecuted initial draft memorandum of understanding between the parties.[7] It was further assumed that SRA is operating under a balanced budget, and that all additional revenue would be used for the purposes of economic development. This incremental revenue was then allocated to counties within the SRA service area based on the percentage of the respective county that falls within the Sabine Basin.[8] Once allocated, the counties' respective multiplier effect was applied to the grants, resulting in a total net present value benefit of $110,839,376 (in 2005 dollars).

5.3.2 Economic Benefits to the Receiving Basin (DWU, NTMWD, and TRWD)

The impetus for the Toledo Bend project is a projected water supply shortfall by all participating entities within the coming decades. This shortfall, projected by the Region C state water plan, is due to the rapid expansion of the Dallas-Ft. Worth area and the associated increased demand on water resources.[9] While a substantial population increase is projected, it will only come to fruition if the supply of water is sufficient to support the increase. The TBG was formed to assure that sufficient water supplies exist to serve current and future customers.

Currently, it is assumed that DWU, NTMWD, and TRWD will all receive water incrementally from the Toledo Bend Reservoir as required to meet demand. Eventually, each entity will receive a total of 200,000 acre-feet of water annually, while SRA will receive 100,000 acre-feet from the transfer.[10] The water deliveries will be progressive, increasing incrementally based on the need of the members of the TBG.

Similar to the benefits accrued to SRA, the other entities of the TBG, including DWU, NTMWD, and TRWD, will see economic benefits from the increased population supported by the additional water supply. In an effort to quantify and project the

[7] Toledo Bend Water Supply Project, Memorandum of Understanding, December 2004.
[8] SRA Comprehensive Sabine Watershed Management Plan, December 1999.
[9] TWDB 2006 Regional Water Plan
[10] Freese & Nichols Technical Plan, December 2003

economic benefits, each entity was considered separately in order for appropriate assumptions to be made. The following is a brief discussion of the methodology used in projecting the economic benefits to the region.

Economic Benefits to DWU

It is assumed that the increased water supply to DWU will support an incremental population increase beginning in 2008. To project the population that the additional water would support, TWDB Regional Water Plan demand projections were employed. The incremental water, provided annually to DWU, was divided by the appropriate TWDB demand projections, to arrive at the total projected increase in population of 666,469. Additionally, to conservatively estimate the increase in population supported by the additional water supply, 20% of the water slated to be delivered was assumed to be lost and unaccounted for, thereby decreasing the actual number of new residents supported. The 20% lost and unaccounted for factor was applied as opposed to the 12% employed in the SRA economic analysis because the transmission of water from Toledo Bend to DWU will involve the use of bed and banks (transferring the water into another river or reservoir) which exposes the water to evaporation.

To quantify the economic benefit of the increased population, it was assumed that the demographics for Dallas County are indicative of all communities taking water from DWU. The per capita income for Dallas County, $36,617[11], was adjusted for the percentage of disposable income, 76.1%[12], that is locally spent, 70.2%.[13] The calculated multiplier of 1.49[14] was then applied to the adjusted per capita income, resulting in a per capita annual impact of $29,154. Assuming a total population increase of 666,469, the total present value economic benefit to DWU is estimated be approximately $435 billion dollars (in 2005 dollars).

Economic Benefits to NTMWD

NTMWD, located in Collin County, stands to gain the most from the Toledo Bend project. The entity currently serves the City of McKinney, recently named the fastest growing city in the United States with a population over 50,000.[15] In addition, the population of Collin County is projected to more than double in the next 15 years.[16]

To project the population that the additional water would support, TWDB Regional Water Plan demand projections were employed. The incremental water, provided

[11] Olson, Doug, and Scott Lindall, "IMPLAN Professional Software, Analysis, and Data Guide"; Minnesota IMPLAN Group, Inc.
[12] Ibid
[13] Ibid
[14] Ibid
[15] City of McKinney, Press Release, 2004.
[16] Texas Water Development Board, 2006 Region C Water Plan

annually to NTMWD, was divided by the appropriate TWDB demand projections to arrive at the annual projected increase in population. This resulted in a total projected population increase of 627,744. To conservatively estimate the increase in population supported by the additional water supply, 20% of the water slated to be delivered to NTMWD was assumed to be lost and unaccounted for.

The demographics for Collin County were used in the process of quantifying the economic benefits of the additional water. The per capita income for Collin County, $39,941[17], was adjusted for the percentage of disposable income, 78.1%[18], that is locally spent, 59.5%[19]. The calculated multiplier of 1.39[20] was then applied to the adjusted per capita income, resulting in a per capita annual impact of $25,851. Assuming a total population increase of 627,744, the total present value economic benefit to NTMWD is estimated be approximately $401 billion dollars (in 2005 dollars).

Economic Benefits to TRWD

To project the population that additional water from the Toledo Bend Interbasin Transfer would support for TRWD, TWDB Regional Water demand projections were used. The incremental water from Toledo Bend reservoir was divided by the appropriate TWDB demand projections to arrive at the annual projected increase in population. This results in a total projected population increase of 757,510. To conservatively estimate the increased population supported by the additional water supply, 20% of the water slated to be delivered to TRWD was assumed to be lost and unaccounted for.

The demographics for Tarrant County were used in the process of quantifying the economic benefits of the additional water to the TRWD service area. The per capita income for Tarrant County, $31,054[21] was adjusted for the percentage of disposable income, 80.9%[22], that is locally spent, 70.2%[23]. The calculated multiplier of 1.55[24] was then applied to the adjusted per capita income, resulting in a per capita annual impact of $27,322. Assuming a total population increase of 757,510, the total present value economic benefit to NTMWD is estimated be approximately $464 billion dollars (in 2005 dollars).

Appendix C, Schedule 2 illustrates the detailed socioeconomic analysis and present value calculations as discussed in section 5.3.

[17] Texas Water Development Board, 2006 Region C Water Plan
[18] Ibid
[19] Ibid
[20] Ibid
[21] Olson, Doug, and Scott Lindall, “IMPLAN Professional Software, Analysis, and Data Guide”; Minnesota IMPLAN Group, Inc.
[22] Ibid
[23] Ibid
[24] Ibid

5.4 Findings and Conclusions

Based on the above analysis, R.W. Beck offers the following findings and conclusions:

1. When compared to desalinated seawater, the Toledo Bend Interbasin Transfer appears to be significantly more cost effective. This variance is likely due to the increased treatment costs associated with desalination, as well as the increased distance desalinated water would have to be conveyed so as to supply Region C. While desalinated seawater was the only option requested for comparison by TWDB Staff, it is possible the other more cost effective, short-term options are still available to Region C, thus explaining why the Toledo Bend Interbasin Transfer is only considered as a long-term supply option. However, despite its cost effectiveness as compared to desalinated seawater, it should be realized that the costs associated with the Toledo Bend Interbasin Transfer are, in the opinion of the Project Team, significantly greater than other more conventional supply options.

2. Should the Toledo Bend Interbasin Transfer be implemented, significant benefits will accrue to both the Basin of Origin and the Receiving Basin. Additionally, as noted above, R.W. Beck's analysis only takes into account the long-term impacts of the transfer. With the inclusion of the short-term impacts, it is likely that the net economic benefit of the project will be even greater.

   It should be noted that the Project Team's analysis does not include any negative economic impacts to either the Basin of Origin or the Receiving Basin. While the potential for such impacts does exist, it is the opinion of the Project Team that these impacts will be minimal, and that they are more than offset by the economic benefits of the project. Additionally, there does exist the potential for negative social impacts, such as the disturbance of wildlife habitats during the construction of the Toledo Bend Pipeline and changes to current waterways from the use of bed and banks conveyance. R.W. Beck recommends that further qualitative study be undertaken to determine if negative impacts exist which are not encompassed within this analysis. However, even if negative impacts of this project should be found and quantified, the net economic benefit of this project will still be substantial.

3. It is the conclusion of the Project Team that the junior priority provision did not play a role in the regional planning group's decision to consider the Toledo Bend Interbasin Transfer solely as a long-term water management strategy. The significant costs of this project have likely been the driving force that has led to the delay in implementation of this strategy. As long as more cost effective options are available to the Region C planning group, and until some measure of financial assistance is provided, it is likely that the implementation of the Toledo Bend Interbasin Transfer will continue to be delayed.

Section 6
Lower Guadalupe Water Supply Project

6.1 Introduction and Background

According to the 2001 and 2006 Region L water plans, Bexar County is already experiencing water shortages. To help meet demand, it has been proposed that the Lower Guadalupe Water Supply Project be developed. This project involves the construction of an intake and pump station at the pool formed by the Guadalupe River Saltwater Barrier. This water would then be transmitted through a 120-inch pipeline to off-channel reservoirs and a well field. From the off-channel reservoir, an additional pipeline will be constructed to transmit the water to a terminal storage facility in Southern Bexar County, a water treatment plant, and supplemental facilities for integration into the public water supply. Sources of water for this strategy include underutilized water rights from the Guadalupe-Blanco River Authority (GBRA), a new surface water appropriation, and groundwater from the Gulf Coast Aquifer.

Prior to S.B. 1 and the establishment of Regional Water Planning Groups (RWPG), the South Central Texas RWPG was split between two water planning regions, the Southern Edwards Zone and the Mid-Coast Region. Because of this division, this specific interbasin transfer was not considered an option in the 1997 water plan. The plan does indicate that San Antonio Water System (SAWS) would likely experience shortages in the future, and recommended the development and conveyance of water supplies from the Guadalupe River to Bexar County by 2010. However, where these supplies would be developed and how they would be conveyed was left unanswered.

In the 2001 Region L water plan, the Lower Guadalupe Water Supply Project (LGWSP) was originally adopted as a water management strategy (then referred to as Lower Guadalupe River Diversions). At the time of adoption in the 2001 plan, the LGWSP was slated for development in 2010.

In 2006, Region L failed to adopt its regional water plan before the statutory deadline and has not been adopted by the TWDB; however, the plan given to the State is considered herein as if it was an adopted plan. In 2006, the Lower Guadalupe Water Supply Project was considered as a potential strategy, but was ultimately not adopted by the RWPG to meet the needs of Bexar County. A modified version of the LGWSP was considered and adopted to increase GBRA's ability to supply water to its statutory district which includes Calhoun, Refugio, and Victoria counties. As the LGWSP will now be used to meet the needs with GBRA's statutory district, it appears that it is no longer considered a viable option for meeting the future water needs of Bexar County.

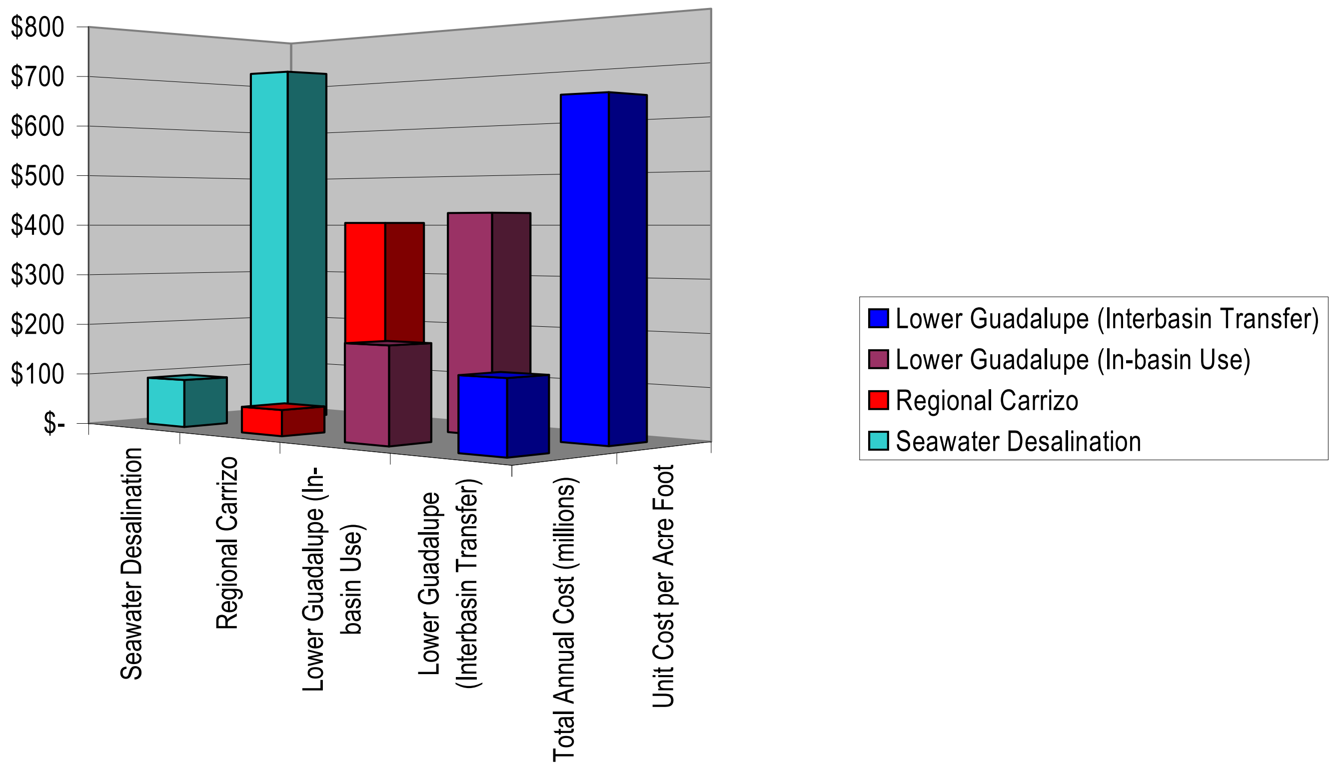
6.2 Cost Comparisons

As requested by TWDB Staff, R.W. Beck's Project Team performed a cost comparison between the Lower Guadalupe Water Supply Project and two alternative water management strategies: the Saws Gonzales – Carrizo Project and desalinated seawater. Based upon the analysis performed, Table 6-1 summarizes the present cost per acre foot of each strategy. Figure 6-1 graphically illustrates the annual cost of each strategy as well as the present cost per acre foot.

Table 6-1
Present Cost per Acre-Foot Comparison of Lower Guadalupe Water Supply Project and Selected Alternative Strategies

Lower Guadalupe Water Supply Project (Interbasin)	
Cost per Acre Foot	$ 641
Lower Guadalupe Water Supply Project (In-basin)	
Cost per Acre Foot	$ 423
SAWS Gonzales – Carrizo Project	
Cost per Acre Foot	$ 405
Seawater Desalination	
Cost per Acre Foot	$ 719

Figure 6-1
Cost Comparison of Lower Guadalupe Water Supply Project and Selected Alternative Strategies



6.2.1 Lower Guadalupe Water Supply Project

As previously mentioned, the development of the Lower Guadalupe Water Supply Project would involve extensive capital development. As discussed in the Region L Technical Memorandum, facilities needed for the project would include an intake and pump station from the Basin of Origin, a 120-inch pipeline to two 25,000 acre-foot reservoirs, a well field capable of producing 41,400 acre-feet annually, and a 91.5 mile, 54-inch transmission pipeline. While the cost for this project would ultimately have been shared between the three project participants, San Antonio Water System (SAWS), San Antonio River Authority (SARA), and the Guadalupe-Blanco River Authority (GBRA), in order to facilitate a true comparison of the project cost with other water management strategies, R.W. Beck considered the total cost associated with this management strategy.

In addition, this project is unique in as much as water flows from the San Antonio River into the reservoir created by the Guadalupe River Saltwater Barrier. The water from this reservoir is slated to be used within the San Antonio River Basin, which would not normally be considered an interbasin transfer. However, current TWDB rules states that the San Antonio River Basin only extends to the confluence of the San

Antonio River and the Guadalupe River, which is slightly upstream from the reservoir created by the saltwater barrier. As such, this project is an interbasin transfer. While the existing GBRA water rights are not considered firm, even if the project were considered as an in-basin transfer, the application of the junior priority provision to this interbasin transfer further decreases the reliability of these water rights, which ultimately reduces the total yield of the project, and thus increases the unit cost of the project when considered as an interbasin transfer. To illustrate the impact of the junior priority provision, R.W. Beck's analysis includes a consideration of the project as an interbasin transfer as well as if the project were considered for in-basin use.

In performing this comparison, the Project Team first escalated the costs from 2002 to 2005 dollars. All capital costs were escalated utilizing the Construction Cost Index History as published by ENR. Non-capital costs were escalated utilizing the same percentage they reflected of capital costs in 2002. All annual costs (i.e., operation and maintenance costs) were escalated by a general 3% inflation factor except for electricity. This was escalated utilizing the industrial electrical power cost category of the Produced Price Index.

Once the costs for the LGWSP were escalated, the Project Team further assumed that it would take 20 years to construct the off-channel storage reservoirs as well as the necessary well-field and conveyance facilities. As such, it was necessary to estimate the potential project cost in 2025. To project the cost of developing the reservoirs, well field, and conveyance system, R.W. Beck utilized the identical percentages that were applied to the costs in order to escalate the said costs from 2002 to 2005.

Upon developing the assumed future cost of the project, R.W. Beck performed a present value cost analysis. This analysis assumed a 50 year time span beginning in 2005, with the project coming on-line in 2025. In performing this analysis, the same indices used to escalate the cost from 2002 to 2005 were used as an annual inflation factor over the life of the project. As previously mentioned, the discount factor utilized in this analysis was equivalent to the 30-year nominal treasury interest rate in August 2006.

Table 6-2 illustrates the results of the present value cost analysis of the project if considered an interbasin transfer. Table 6-3 illustrates the results of the present value cost analysis of the project if considered for in-basin use.

Table 6-2
Present Value Cost Analysis of LGWSP (Interbasin Transfer)

Total Present Value Cost	$973,316,866
Annual Acre-Foot Yield	50,636
Years of Operation in Analysis	30
Total Acre-Foot Yield	1,519,080
Present Value Cost per Acre-Foot	$641

Table 6-3
Present Value Cost Analysis of LGWSP (In-basin use)

Total Present Value Cost	$1,327,061,223
Annual Acre-Foot Yield	104,471
Years of Operation in Analysis	30
Total Acre-Foot Yield	3,134,130
Present Value Cost per Acre-Foot	$423

6.2.2 SAWS Gonzales – Carrizo Project

An alternative water strategy, and one that is currently being pursued by members of Region L, is developing water from the Carrizo aquifer to supply water to Bexar County through the SAWS Twin Oaks facility. This strategy involves the development of four well fields, totaling 42 wells in all, in Gonzales, Wilson, and Bexar Counties and 98 miles of raw water pipeline and 37 miles of treated water pipeline to convey this water to the necessary water treatment / distribution facilities. Under this strategy, approximately 62,600 acre-feet of water will be supplied to Bexar County. While the project is currently planned in three phases, it is considered in this analysis at final build-out.

While this project is currently being undertaken, it is not without controversy. The wholesale water provider involved in this strategy, San Antonio Water System, must operate within the rules and management plans sets forth by the local groundwater districts, Evergreen Underground Water Conservation District (EUWCD), and Gonzales County Underground Water Conservation District (GCUWCD). At present, part of the supply developed by this project allegedly exceeds the water that GCUWCD states is available. The projected water supply to be met with this project cannot be completed until these differences are resolved between SAWS and GCUWCD and the conservation district agrees to grant SAWS the necessary permits under current statutory guidelines. While this controversy does affect the potential yield of the project, R.W. Beck considered the project as contained within the Technical Memorandum as presented in the Region L plan. Based upon the final outcomes of this current dispute, the assumptions to this analysis may need to be revisited.

In performing this comparison, the Project Team first escalated the costs from 2002 to 2005 dollars. All capital costs were escalated utilizing the Construction Cost Index History as published by ENR. Non-capital costs were escalated utilizing the same percentage they reflected of capital costs in 2002. The costs category of contingency and inflation associated with the water supply was calculated as 18% of the updated capital costs, per the Region L cost comparison, excluding costs for integration/distribution.

All annual costs (i.e., operation and maintenance costs) were escalated by a general 3% inflation factor except for electricity. This was escalated utilizing the industrial electrical power cost category of the Produced Price Index. The leases associated with the purchase of the groundwater were escalated by using the same percentage of capital cost applied in 2002.

Once the costs for the SAWS Gonzales-Carrizo Projects were escalated, the Project Team further assumed that it would take 3 years to construct the necessary well fields and conveyance facilities. As such, it was necessary to estimate the potential project cost in 2008. To project the cost of developing the well fields and conveyance system, R.W. Beck utilized the Construction Cost Index History as published by ENR.

Upon developing the assumed future cost of the project, R.W. Beck performed a present value cost analysis. This analysis assumed a 50 year time span beginning in 2005, with the project coming on-line in 2008. In performing this analysis, the same indices used to escalate the cost from 2002 to 2005 were used as an annual inflation factor over the life of the project. As previously mentioned, the discount factor utilized in this analysis was equivalent to the 30-year nominal treasury interest rate in August 2006.

Table 6-4 below illustrates the results of the present value cost analysis of the project. Detailed schedules illustrating the Project Team's analysis are included in Appendix D.

Table 6-4
Present Value Cost Analysis of SAWS Gonzales – Carrizo Project

Total Present Value Cost	$1,190,387,503
Annual Acre-Foot Yield	62,588
Years of Operation in Analysis	47
Total Acre-Foot Yield	2,941,636
Present Value Cost per Acre-Foot	$405

6.2.3 Seawater Desalination

Another alternative management strategy that is being considered for long-term development for Region L is a desalination facility in the vicinity of San Antonio Bay to provide water to the major metropolitan area of Bexar County. While still conceptual, this plan calls for a 25 to 100 MGD desalination facility near the City of Seadrift with diffusion of concentrated brine into deep water in the Gulf of Mexico. Capital facilities required for this project, in addition to the desalination plant, include a water intake, brine transmission and off-shore disposal system, and 126 miles of treated water transmission pipeline with associated pump stations to southern Bexar County. Presently under the Region L Plan, this strategy is not slated for development until 2060.

In order to facilitate a close comparison with both the LGWSP and the SAWS Gonzales – Carrizo Project, R.W. Beck assumed that the 50 MGD plant would be developed. As such, the treated water line facilities in this comparison are assumed to be 60-inches in size.

In performing this comparison, the Project Team first escalated the costs from 2002 to 2005 dollars. All capital costs were escalated utilizing the Construction Cost Index History as published by ENR. Non-capital costs were escalated utilizing the same percentage they reflected of capital costs in 2002. The costs associated with water treatment were escalated based upon the increase in Account 320 – Large Treatment Plant Equipment as illustrated in the Handy-Whitman Index of Public Utility Construction Costs for water utilities. Costs associated with Engineering, Legal and Contingencies reflect 30% of the capital cost associated with the pipeline and 35% of all other capital cost, as recommended by TWDB, Exhibit B to the regional planning guidelines.

All annual costs (i.e., operation and maintenance costs) were escalated by a general 3% inflation factor except for electricity. This was escalated utilizing the industrial electrical power cost category of the Produced Price Index.

Once the costs for the Desalination Project were escalated, the Project Team further assumed that it would take 5 years to construct the necessary treatment plant and conveyance facilities. As such, it was necessary to estimate the potential project cost in 2010. To project the cost of developing the treatment plant and conveyance system, R.W. Beck utilized the identical percentages applied to escalate the costs from 2002 to 2005.

Upon developing the assumed future cost of the project, R.W. Beck performed a present value cost analysis. This analysis assumed a 50 year time span beginning in 2005, with the project coming on-line in 2010. In performing this analysis, the same indices used to escalate the cost from 2004 to 2005 were used as an annual inflation factor over the life of the project. As previously mentioned, the discount factor utilized in this analysis was equivalent to the 30-year nominal treasury interest rate in August 2006.

Table 6-5 illustrates the results of the present value cost analysis of the project:

Table 6-5
Present Value Cost Analysis of Desalinated Seawater for Region L

Total Present Value Cost	$1,811,932,992
Annual Acre-Foot Yield	56,007
Years of Operation in Analysis	45
Total Acre-Foot Yield	2,520,324
Present Value Cost per Acre-Foot	$719

Appendix D, Schedule 1 illustrates the detailed cost comparison analysis and present value cost calculation for each water supply alternative discussed in section 6.2.

6.3 Socioeconomic Impact Analysis

As requested by TWDB, R.W. Beck performed a socioeconomic impact analysis of the Lower Guadalupe Water Supply Project. The relocation of water from the pool formed by the Guadalupe River Saltwater Barrier to Bexar County will create economic impacts to the locales in and around the respective basin. The following is a brief discussion of the assumptions and methodology used to project these impacts. A net present worth analysis of these benefits was performed for the period from 2005 through 2054 and is summarized below in Table 6-6.

Table 6-6
Estimated Socioeconomic Impact of the Lower Guadalupe Water Supply Project

Impacts to the Basin	
Economic Benefits	
Construction: Local Payroll & Materials	$ 315,096,330
Commerce from New Residents	90,803,675,039
Subtotal	$ 91,118,771,369
Total Net Economic Impact of the Lower Guadalupe Water Supply Project	$ 91,118,771,369

The socioeconomic analysis of the Lower Guadalupe Water Supply Project performed by the Project Team is unique from the other analysis presented in this report in two ways. First, for this particular water management strategy, there is no distinct Basin of Origin or Receiving Basin. While the reservoir created below the confluence of the San Antonio River and the Guadalupe River by the Guadalupe River Saltwater Barrier is, by rule, outside of the San Antonio River Basin, geographically the economic impacts of this project will most likely accrue, in majority, to this River Basin. As such, R.W. Beck has not identified a specific Basin of Origin or Receiving Basin for economic analysis purposes. Instead, the economic impacts are assumed to accrue entirely within the San Antonio River Basin.

Second, within our analysis, the Project Team was unable to obtain sufficient and reliable information with which to quantify the negative impacts that will accrue to the basin as a result of this project. While they are not quantified here, negative impacts will occur. These include, but are not limited to, the following:

- Loss of commerce from productive farm and ranch land permanently and/or temporarily removed for the construction off-channel storage reservoirs, well-fields, and the necessary conveyance system; and
- Loss of commerce from farm and ranch subsidies related to the permanent or temporary loss of productive farm and ranch land.

Additionally, negative social impacts may also occur which include, but are not limited to, the impact to wildlife habitats and the impact to the bays and estuaries below the reservoir formed by the saltwater barrier. However, despite the potential for negative economic and social impacts to accrue, it is the opinion of the Project Team that, when considered on a net basis, the total economic benefit of this project would be significant.

The remainder of this section discusses the quantification of the economic benefits which will accrue to the basin.

6.3.1 Benefits to the Basin

Short-Term Benefits

Direct Construction Benefit (Payroll and Materials)

The construction cost of the Lower Guadalupe Water Supply Project is estimated at $784,979,000, but this estimate includes treatment and distribution components that are not required to deliver raw water to Bexar County. By removing the cost of the Water Treatment Plant ($43,197,000), the Integration into the existing SAWS water system ($63,139,000), and proportional costs of related Engineering, environmental, legal and interest during construction ($43,589,308), the adjusted Project Costs become $653,053,692 as shown in Appendix D, Schedule 2, Page 9.[1] The payroll for local construction workers is estimated to be approximately 15% ($95 million in 2002 dollars) of the construction costs while the local purchase of materials is estimated to be 20% of the project cost, or $127 million.[2] To calculate the total short term benefits resulting from the Lower Guadalupe Water Supply Project's construction, the following approach has been employed.

The $95 million local payroll combined with the $127 million locally purchased materials is assumed to be distributed between six (6) counties – the four (4) counties housing the pipelines plus Victoria County where the diversion point (the saltwater barrier pool) exists and the termination point in Southern Bexar County. The local payroll and materials are assumed to be distributed within these six (6) counties in the same proportion as their populations. According to Implan Software, the six (6) counties, although similar, have distinct economic characteristics. Disposable income in Karnes County is measured to be 93.5% available for spending whereas Bexar County exhibits an 85.3% spending availability. The other four (4) counties in the analysis demonstrate disposable income spending availabilities between those two

[1] Lower Guadalupe Water Supply Project Costs from Region L TWDB Water Plan 2006.
[2] RS Means Manuals

ranges.[3,4] The population in Goliad County buys only 38.4% of its products from local (County) sources while Bexar County residents spend 68.4% of their income locally. These differences in spending behaviors from county to county are important factors when assessing the benefits of the Lower Guadalupe Water Supply Project to the basin. The table below illustrates the different economic factors assumed for each county.

Table 6-7
Economic Factors for Counties within Lower Guadalupe Water Supply Project Basin

	Refugio	Goliad	Karnes	Wilson	Bexar	Victoria
% disposable	92.8%	92.5%	93.5%	90.8%	85.3%	87.4%
% locally spent	40.6%	38.4%	45.5%	38.7%	68.4%	60.0%
Multiplier	1.12	1.13	1.18	1.12	1.54	1.35

When applied to the local payroll and purchase materials distributions, these economic factors result in a total economic benefit for all six (6) counties of approximately $139 million.[5] The project is scheduled for construction during the years 2010 through 2014. For purposes of this analysis, it is assumed that one-fifth of the construction dollars will be spent in each of these years.

Long-Term Benefits

Increased Commerce from New Residents

For purposes of this analysis, it is assumed that the Lower Guadalupe Water Supply Project will begin to deliver the full project yield in 2025, and that this increased water supply to Bexar County will support an incremental population increase beginning at that time. To project the population that the additional water would support, TWDB Regional Water Plan demand projections were employed. The incremental water, provided annually to Bexar County, was divided by the appropriate TWDB demand projections, to arrive at the estimated total project increase in population of 451,854. Additionally, to conservatively estimate the increase in population supported by the additional water supply, 12% of the water slated to be delivered was assumed to be lost and unaccounted for to reflect the evaporation from on-channel and storage reservoirs.

The economic impact on the local economy has been estimated by multiplying the per capita income of $27,810 (in 2003 dollars) for Bexar County residents by the Bexar

[3] For purposes of this analysis, all dollar values determined in a particular year were escalated by an annual inflation rate of 3% to the appropriate years under consideration within each element of the analysis.
[4] Olson, Doug and Scott Lindall, "IMPLAN Professional Software, Analysis, and Data Guide"; Minnesota IMPLAN Group, Inc.
[5] Ibid

County disposable income factor of 85.3% to get the disposable income per capita.[6] The population in Bexar County buys 68.4% of its products from local sources and spends 31.6% on goods imported from outside Bexar County, resulting in total disposable income per capita spent locally of $16,230.[7] The multiplier effect for household spending in Bexar County is 1.54 resulting in an economic benefit per capita of $24,984.[8] By utilizing these County factors, the present value of the economic benefit from Commerce from new Bexar Residents is estimated at over $90 billion.

Appendix D, Schedule 2 illustrates the detailed socioeconomic analysis and present calculations as discussed in section 6.3.

[6] Olson, Doug and Scott Lindall, "IMPLAN Professional Software, Analysis, and Data Guide"; Minnesota IMPLAN Group, Inc.

[7] Ibid

[8] Ibid

6.4 Findings and Conclusions

Based on the above analysis, R.W. Beck offers the following findings and conclusions:

1. Out of the water supply alternatives chosen for comparison, the SAWS Gonzales – Carrizo Project appears to have the most economical per unit cost. The most expensive supply alternative, even excluding the necessary conveyance facilities, is desalinated seawater. Due to the unique nature of the LGWSP, R.W. Beck chose to compare this alternative as both as an interbasin transfer and for in-basin use. When considered for in-basin use, the Lower Guadalupe Water Supply Project could be considered to be competitive with the SAWS Gonzales – Carrizo Project. However, when considered as an interbasin transfer, the unit cost of this alternative is significantly higher, affirming the SAWS Gonzales – Carrizo Project as the most cost effective alternative.

   As an interbasin transfer, the LGWSP's annual costs diminish, but the unit cost increases significantly. This disparity is due to the fact that, as an interbasin transfer, and thus subject to the junior priority provision, a reduced amount of water can be taken. This also serves to explain the reduction in annual costs, as a smaller pipeline and associated infrastructure is needed to move a smaller amount of water. As this project has a significant amount of fixed costs involved, these fixed costs drive-up the unit cost when considered as an interbasin transfer. It is clear in this case that the junior priority provision does impact the unit cost of this particular project, and serves to reduce its competitiveness with other water management strategies. The Project Team would however note that even as an interbasin transfer, this project is still more economical than the provision of desalinated seawater.

2. While the LGWSP has since been modified and used solely to serve the needs of GBRA, had it been implemented as an interbasin transfer, with conveyance of water to Bexar County, it is the Project Team's opinion that significant economic benefits would have accrued to the San Antonio River Basin.

   It should be noted that the Project Team's analysis does not project any negative economic impacts of this project. This is due to the fact that sufficient and reliable information was not available with which to project these impacts. While negative economic impacts will be present, the Project Team believes that the economic benefits will more than offset any negative economic impacts experienced.

3. While it is clear that the junior priority provision has an impact on the costs of this project, based on public comments and discussions with representatives of SAWS, SARA, and GBRA, it appears that this provision was only one of many variables which led to this particular strategy being modified and used only to meet the projected needs within GBRA's statutory district. Other variables included the environmental impact, including concern about wildlife habitats, and the use of groundwater to firm up the supply. Had circumstances

been such that this project could have been pursued as an in-basin transfer, it is still likely that concerns regarding the project's impact to the environment and to existing ground and surface water supplies would have led to the same result.

Section 7
Market Survey of Water Rights

7.1 Introduction and Background

Opponents of the changes made to Texas Water Code Section 11.085 by S.B. 1 claim that the junior priority provision will hinder the marketing of water rights in Texas. The foundation of this argument is based on the assumption that the value of a water right is tantamount to the reliability of that right. In other words, a purchaser of a water right will pay more for a right which can be relied upon during a period of drought. For those rights that are junior to other upstream or downstream rights, the purchase price will, presumably, reflect that in a period of drought, other water right appropriations will be met first.

In an effort to determine the merit of the above argument, the third component of this study was designed to attempt to determine the effect, if any, the junior priority provision, as contained within Texas Water Code Section 11.085, has on the value of water rights. In an effort to quantify this difference, R.W. Beck's Project Team attempted to study water rights transactions which occurred under either of the following two scenarios.

1. Assuming the priority date of a water right changed as a result of a transaction, in other words, made junior to other existing water rights.
2. Assuming a water right maintained its original priority date after a transaction.

The premise of the above methodology is that, if a right loses its priority date, or in other words made junior, as a result of the transaction, the transaction price paid for that right will likely be less than that of another water right whose priority date did not change as a result of the transaction.

7.2 Analysis

Working with the TCEQ and other water marketing stakeholders throughout the state, R.W. Beck assembled a database of over approximately 1,200 water right transactions/changes dating back to April of 2001. This effort also included a review of past issues of the "Water Strategist," as published by Stratecon, Inc. which contained additional data on water transactions. This review included issues dated back to January of 1999. Once compiled, these transactions were filtered to exclude transactions which met the following parameters:

- groundwater transactions;
- water leases;

- transactions in which only the name of the water right owner changed;
- water rights transaction that are currently in process; and
- transactions that are currently contested.

It should be noted that R.W. Beck's Project Team diligently pursued transactions dating back prior to the adoption of S.B. 1 in 1997 from TCEQ, but was only able to obtain information from 2001 to the present. While this information would help to produce a more thorough analysis, the study methodology as constructed by the Project Team overcomes this deficiency by looking at all water rights transactions whose priority date would change as a result of the transaction, not simply water rights transactions that are involved in interbasin transfers.

Once obtained, the Project Team used sampling techniques on the filtered data to develop a representative sample of the transaction database. As part of developing this sample, the Project Team focused solely on those transactions involving public entities in an effort to utilize and obtain data that is already in the public domain. Once the sample was developed, Project Team members contacted either the buyer and/or the seller involved in the transaction and requested the following information:

- Quantity of the water transacted;
- Purchase price of the transaction;
- Priority Date of the water right after the transaction; and
- Whether the priority date of the water right changed as a result of the transaction.

Through telephone and e-mail contact, R.W. Beck was able to obtain data on a limited number of transactions, the results of which are illustrated in Appendix E. It should be noted that in the process of contacting these transaction participants, several more transactions were excluded from the analysis as they did not fit the research parameters. Additionally, the response rate of those entities contacted was very poor. Once completed, our analysts were only able to obtain quality information on a limited number of transactions.

Upon looking at the transactions for which information was obtained, it was concluded that not a single transaction involved a water right whose priority date changed as a result of the transaction. In an effort to find transactions which did fit the defined criteria, the Project Team contacted leading water marketers throughout the state. However, these individuals were only able to provide one transaction which met the defined criteria, and this transaction was not useful as the entity that purchased the junior water right already owned the water rights that were senior to the right purchased. Essentially, this entity was simply enhancing the reliability of their own existing rights through this purchase.

One expert suggested that we refine our methodology by randomly picking two transactions and, by using water availability models (WAM), determine which transaction involved the more reliable water right. Then, based upon the transaction data obtained, determine the price of the two modeled water rights. Conducting this analysis multiple times could theoretically lead you to the conclusion that, if in every iteration of the analysis the purchase price of the more reliable water right was higher, then reliability, and a senior water right, is valued higher. Thus, it would logically follow, that the junior priority provision does in fact impact water marketing.

However, the key flaw in this analysis is that it excludes other factors that may impact the purchase price of the water. For example, the need or demand for water also greatly impacts the price a buyer is willing to pay. If the need for water is urgent enough and supply options are limited, an individual may be willing to pay a price for water which is not commensurate with the water's priority. In economic terms, if the need for water is significant enough, the individual's demand will be more price inelastic.

Based upon the above analysis and the results of our market survey, R.W. Beck estimates the value of water rights in the state averages just under $1,000 per acre-foot (weighted average of $634 per acre-foot), with a range per acre-foot of $15.00 to $2,600.00, approximately. However, R.W. Beck would note that the price of every individual transaction will vary based on the unique circumstances of the transaction.

7.3 Findings and Conclusions

Based upon our analysis and the difficulties previously discussed, it is the conclusion of the Project Team that the water market in Texas is still not sufficiently developed to draw any firm conclusions as to the impact of the junior priority provision. Sufficient transactions do not exist, and those transactions that do exist do not provide a complete picture by which to draw causal relationships. R.W. Beck does recommend that, as the water market in Texas matures, further study should be undertaken to determine the impact reliability has on transaction prices. Should reliability be found to be a significant determining factor, then lawmakers might consider amending or removing the junior priority provision.

R.W. Beck would conclude that two circumstances may currently exist which impact the number of surface water right transactions. First, the cost of conveying surplus surface water to the area where it is needed carries significant cost. At the present time, other water management strategies are still more cost effective, causing water suppliers to seek other alternatives than purchasing water rights from distant geographical areas. Additionally, there is limited financial assistance available to water suppliers to assist in bearing the cost of the additional conveyance infrastructure required to achieve a transfer of surface water. Until such time as the transfer of water becomes a more cost effective option, in light of other supply alternatives, or until additional funding mechanisms are available, it is likely that there will continue to be very few surface water right transactions.

Second, those in the state who do possess surplus surface water are most likely to lease that water as opposed to selling the water right. This is likely in anticipation of the projected water needs of the state being realized. As demand increases, so will the compensation associated with the purchase of water rights. As the need for water grows, it is likely that a proportional increase in water marketing activity will also be seen, assuming that sufficient infrastructure financing alternatives are available.

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

WR	Owner	Basin From	Source	Basin To	Amount	Priority	Use	Subject to SB1	Junior Date?
3782	Canadian River Municipal Water Authority	CANADIAN	Lake Meredith	Red, Brazos, Colorado	151,200	1956	municipal/industrial	No	No
3985	City of Lubbock	CANADIAN	Lake Meredith	Brazos	22,910	1983	industrial/irrigation	No	No
4301	Greater Texoma Utility Authority	RED	Lake Texoma	Trinity, Sabine	25,000	2006	multiple	Yes	Yes
4898	Red River Authority of Texas	RED	Lake Texoma	Trinity	2,000	1974	multiple	No	No
4899	Red River Authority of Texas	RED	Lake Texoma	Trinity	250	1967	municipal	No	No
4881	City of Gainesville	RED	Fish Creek	Trinity	4,500	1962	municipal	No	No
					3,240	2006		Yes	No (E)
4940	City of Paris	RED	Pat Mayse Lake	Sulphur	21,115	1964	municipal/industrial	Yes	No (E)
4943	City of Paris	RED	Lake Crook	Sulphur	12,000	1922	municipal	No	No
4961	City of Texarkana	RED	Bringle Lake	Sulphur	2,220	1928	municipal	No	No
5003	North Texas Municipal Water District	RED	Lake Texoma	Sabine, Trinity	84,000	1985	municipal	No	No
5144	City of Wichita Falls	RED	Lake Kickapoo	Brazos	1,120	1984	municipal	No	No
5145	City of Megargel	RED	Megargel Creek Lake	Brazos	70	1962	municipal	No	No
5146	City of Olney	RED	Olney Lake, Lake Cooper	Brazos	450	1935	municipal	No	No
					810	1953	municipal	No	No

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

WR	Owner	Basin From	Source	Basin To	Amount	Priority	Use	Subject to SB1	Junior Date?
					35	1980	irrigation	No	No
5211	MacKenzie Municipal Water Authority	RED	Lake MacKenzie	Brazos	2,600	1982	municipal/industrial	No	Yes
4797	Sulphur River Municipal Water District (Upper Trinity Regional Water District)	SULPHUR	Lake Chapman	Trinity	16,106	1965	municipal/industrial	No	No
	North Texas Municipal Water District			Sabine, Trinity	3,214	1965	municipal	No	No
4798	North Texas Municipal Water District	SULPHUR	Lake Chapman	Sabine, Trinity	54,000	1965	municipal	No	No
4799	City of Irving	SULPHUR	Lake Chapman	Trinity	54,000	1965	municipal/industrial	No	No
4811	Sulphur Springs Water District	SULPHUR	Lake Sulphur Springs	Sabine	2,000	1951	municipal	No	No
					7,800	1968	municipal/industrial	No	No
4836	City of Texarkana	SULPHUR	Lake Wright Patman	Cypress	9,000	1981	municipal/industrial	No	Yes
				Red	11,500	1981	municipal/industrial	No	Yes
5873	Red River Redevelopment Authority	SULPHUR	Caney and Elliot Creeks	Red	2,960	2006	Municipal	Yes	No[5]
4560	Franklin County Water District	CYPRESS	Lake Cypress Springs	Sulphur, Sabine	4,000	1970	municipal	No[6]	Yes
					173	1980		No[6]	Yes
					2,012	1980		No[6]	Yes
					2,200	1980		No[6]	Yes

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

WR	Owner	Basin From	Source	Basin To	Amount	Priority	Use	Subject to SB1	Junior Date?
					1,000	1966		No	Yes
4590	Northeast Texas Municipal Water District	CYPRESS	Lake O' the Pines	Sabine	20,000	1957	municipal/industrial	No	No
4614	City of Marshall	CYPRESS	Cypress Creek	Sabine	7,558	1947	municipal/industrial	Yes	No (E)
					8,442	1956		Yes	No (E)
4658	Sabine River Authority of Texas	SABINE	Sabine River	Neches	80,000	1958	municipal/industrial	No	No
4662	Sabine River Authority of Texas	SABINE	Sabine River	Neches	30,000	1946	multiple	No	No
4669	Sabine River Authority of Texas	SABINE	Lake Fork	Trinity	120,000	1983	municipal	No	Yes
					5,048	1992		No	Yes
4670	Sabine River Authority of Texas	SABINE	Lake Tawakoni	Trinity	207,765	1955	municipal	No	No
				Sulphur	8,396	1986		No	Yes
				Trinity	20,000	1986		No	Yes
4693	City of Van	SABINE	Van Lake	Neches	150	1949	municipal	No	No
					250	1976		No	No
4724	Hide-Away-Lake Club	SABINE		Neches	180	1970	irrigation	Yes	No (E)
					179.42	1994		Yes	No (E)
3254	Upper Neches River Municipal Water Authority	NECHES	Lake Palestine	Sabine, Trinity	114,337	1972	municipal/industrial	Yes	No (E)
					18,000	1983		Yes	No (E)

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

WR	Owner	Basin From	Source	Basin To	Amount	Priority	Use	Subject to SB1	Junior Date?
3256	Athens Municipal Water Authority	NECHES	Lake Athens	Trinity	8,500	1955	municipal	No[6]	No
3879	Texaco	NECHES	Neches River	Neches-Trinity	12,900	1982	industrial	No	No
4404	City of Center	NECHES		Sabine	Authorizes return flows to Sabine River Basin			No	No
4411	Lower Neches Valley Authority	NECHES	Sam Rayburn Reservoir, Neches River and Pine Island Bayou	Neches-Trinity	219,252	1913	irrigation	No	No
					107,108			No	No
					820,000	1963	multiple	Yes	No (E)
4415	City of Beaumont	NECHES	Neches River	Neches-Trinity	6,570	1915	municipal	No	No
					49,897	1925		No	No
4228	Angelina and Neches River Authority	NECHES	Lake Columbia	Sabine	2,200	1985	municipal	No	No
4853	City of Tyler	NECHES	Lake Tyler	Sabine	40,325	1947	municipal/industrial	No	No
2319	City of Saint Jo	TRINITY	Elm Fork Trinity River	Red	330	1957	municipal	No	No
3356	City of Weatherford	TRINITY	Lake Weatherford	Brazos	5,220	1954	municipal/industrial	No	No
4248	Trinity River Authority	TRINITY	Lake Livingston	Neches, Neches-Trinity	351,600	1959	industrial/irrigation	No[6]	No
				San Jacinto	51,600		industrial	No[6]	No
4261	City of Houston	TRINITY	Lake Livingston	Trinity-San Jacinto	31,600	1913	industrial	No	No
				San Jacinto	13,400		irrigation	No	No
				Neches-Trinity	28,000	1959	industrial	No	No

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

WR	Owner	Basin From	Source	Basin To	Amount	Priority	Use	Subject to SB1	Junior Date?
				Trinity-San Jacinto	444,000		municipal	No	No
				San Jacinto	458,800		industrial	No	No
				San Jacinto-Brazos	10,000		municipal	No	No
4279	Chambers-Liberty Counties Navigation District	TRINITY	Trinity River	Neches-Trinity	36,667	1906	irrigation	No[6]	No
			Lake Anahuac, Trinity River		36,667	1914		No[6]	No
					36,666			No[6]	No
5271	San Jacinto River Authority	TRINITY	Trinity River	Neches-Trinity	7,500	1917	irrigation	No	No
				Trinity- San Jacinto	20,000	1926		No	No
				San Jacinto	17,500	1929		No	No
					11,000	1936	industrial	No	No
	Devers			Neches-Trinity	2,500	1929	irrigation	No	No
5809	San Jacinto River Authority	SAN JACINTO	San Jacinto River	Trinity-San Jacinto	14,944	2004	municipal/industrial	Yes	No (E)
5169	Brazos River Authority	SAN JACINTO-BRAZOS	Oyster and Jones Creek	San Jacinto, Brazos	12,000	1948	multiple	No	No
5338	Texas Department of Corrections	SAN JACINTO-BRAZOS	Oyster Creek	Brazos	300	1985	irrigation	No	No
2925	TWDB, City of Houston, Brazos River Authority	BRAZOS	Allen's Creek Reservoir	San Jacinto, San Jacinto-Brazos	99,650	1999	multiple	Yes	No (E)
2971	City of Lampasas	BRAZOS	Sulphur Creek	Colorado	180	1986	municipal	No	No

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

WR	Owner	Basin From	Source	Basin To	Amount	Priority	Use	Subject to SB1	Junior Date?
5155	Brazos River Authority	BRAZOS	Possum Kingdom Reservoir	Trinity	5,240	1986	municipal	No	No
5156	Brazos River Authority	BRAZOS	Lake Granbury	Trinity	2,600	1986	municipal	No[6]	Yes
					17,400			No[6]	Yes
5167	Brazos River Authority	BRAZOS	Brazos River	San Jacinto-Brazos	200,000	Non-priority	municipal/industrial	No	No
5168	Gulf Coast Water Authority	BRAZOS	Brazos River	San Jacinto-Brazos	99,932	1926	multiple	No	No
5171	Brazos River Authority	BRAZOS	Brazos River	San Jacinto-Brazos	75,000	1939	multiple	No	No
					50,000	1950	municipal/industrial	No	No
5287	Bi-Stone Municipal Water Supply District	BRAZOS	Lake Mexia	Trinity	2,952	1957	municipal	No	No
5291	City of Teague	BRAZOS	Teague City Lake	San Jacinto-Brazos	605	1952	municipal	No	No
5322	Chocolate Bayou Water Company	BRAZOS	Brazos River	San Jacinto, San Jacinto-Brazos	40,000	1929	irrigation	No[6]	No
					40,000	1955		No[6]	No
					75,000	1983		No[6]	No
5328	Dow Chemical Company	BRAZOS	Brazos River	San Jacinto-Brazos	20,000	1929	industrial	No	No
					150,000	1942	municipal/industrial	No	No
					110,000	1960	industrial	No	No
					3,136	1976	municipal	No	No
5366	Brazosport Water Authority	BRAZOS	Brazos River	San Jacinto-Brazos, Brazos-Colorado	45,000	1960	municipal	No	No
1002	Colorado River Municipal	COLORADO	Lake J.B. Thomas	Brazos	30,000	1946	multiple	No	No

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

WR	Owner	Basin From	Source	Basin To	Amount	Priority	Use	Subject to SB1	Junior Date?
	Water District								
1031	City of Sweetwater	COLORADO	Oak Creek Reservoir	Brazos	9,328	1949	municipal/industrial	No	No
1660	City of Clyde	COLORADO	Lake Clyde	Brazos	200	1985	municipal	No	Yes
3676	Colorado River Municipal Water District	COLORADO	O.H. Ivie Reservoir	Brazos	15,000	1978	municipal	Yes	No (E)
4007	City of Cedar Park	COLORADO	Lake Travis	Brazos	18,000	1938	municipal	Yes	No (E)
5434	Lower Colorado River Authority	COLORADO	Colorado River	Brazos-Colorado, Colorado-Lavaca, Lavaca	133,000	1900	multiple	No	No
	City of Corpus Christi			Colorado-Lavaca, Lavaca, San Antonio, Nueces, Lavaca-Guadalupe, San Antonio-Nueces, Nueces-Rio Grande	35,000			No	Yes[8]
5437	Lower Colorado River Authority and STPNOC	COLORADO	Colorado River	Colorado-Lavaca	102,000	1974	industrial	No	No
5471	City of Austin	COLORADO	Lake Austin	Brazos, Guadalupe	249,000	1913	municipal	No	No
			Town Lake		22,403	1914		No	No
5475	Lower	COLORADO	Eagle Lake	Brazos-	52,500	1901	irrigation	No	No

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

WR	Owner	Basin From	Source	Basin To	Amount	Priority	Use	Subject to SB1	Junior Date?
	Colorado River Authority			Colorado, Colorado-Lavaca	78,750	1987		No	No
5476	Lower Colorado River Authority	COLORADO	Colorado River	Brazos-Colorado, Colorado-Lavaca	228,570	1900	irrigation	No	No
					33,930	1987		No	No
5477	Lower Colorado River Authority	COLORADO	Colorado River	Brazos-Colorado, Colorado-Lavaca	110,000	1907	irrigation	No[6]	No
5677	Lower Colorado River Authority	COLORADO	Lake Travis	Brazos	6,400	1938	municipal	Yes	No (E)
5715	Lower Colorado River Authority	COLORADO	Colorado River (Lometa Reservoir)	Brazos	476	1938	municipal	Yes	No (E)
5730	Brazos River Authority	COLORADO	Colorado River and Lake Travis	Brazos	25,000	1938	multiple	Yes	No (E)
3978	J.H. Robinson	LAVACA	Lavaca River	Lavaca-Guadalupe	1,800	1983	irrigation	No	No
2095	Lavaca Navidad River Authority	LAVACA	Lake Texana	San Antonio, Nueces, San Antonio-Nueces, Nueces-Rio Grande	46,518	1972	municipal	No	No
					7,500	2003	multiple	Yes	No[5]
5584	County of Jackson	LAVACA and LAVACA-GUADALUPE	Lavaca River, Garcitas Creek, Venado	Lavaca, Lavaca-Guadalupe	2	1997	industrial	No	No

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

WR	Owner	Basin From	Source	Basin To	Amount	Priority	Use	Subject to SB1	Junior Date?
			Creek, Dry Creek						
2074	Guadalupe-Blanco River Authority	GUADALUPE	Canyon Lake	Colorado, Colorado-Lavaca, Lavaca, Lavaca-Guadalupe, San Antonio, San Antonio-Nueces	62,900	1956	multiple	No[6]	No
					57,100	1999		Yes	No[5]
3606	Gulf Oil Chemicals	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	9,676	1978	industrial	No	No
3860	City of Victoria	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	260	1951	municipal	No	No
3861	E.I. Du Pont de Nemours and Company	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	60,000	1948	industrial	No	No
3863	Guadalupe-Blanco River Authority	GUADALUPE	Guadalupe River	Lavaca, Lavaca-Guadalupe, San Antonio, San Antonio-Nueces	3,000	1951	irrigation	No	No
4276	Del Williams	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	272	1985	industrial	No	No
5012	Joe D. Hawes	GUADALUPE	Elm Bayou	San Antonio	140	1985	industrial	No	No
5173	Guadalupe-Blanco River Authority	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	2,500	1941	industrial/irrigation	No	No
5174	Guadalupe-Blanco River	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	1,870	1944	industrial/irrigation	No	No

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

WR	Owner	Basin From	Source	Basin To	Amount	Priority	Use	Subject to SB1	Junior Date?
	Authority								
5175	Guadalupe-Blanco River Authority	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	940	1951	industrial/irrigation	No	No
5176	Guadalupe-Blanco River Authority	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	9,944	1951	multiple	No	No
5177	Guadalupe-Blanco River Authority	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	42,615	1944	multiple	No	No
					8,632	1948	irrigation	No	No
5178	Guadalupe-Blanco River Authority	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	106,000	1952	multiple	No	No
5466	City of Victoria	GUADALUPE	Guadalupe River	Lavaca-Guadalupe	20,000	1993	municipal	No	No
2130	BMA WCID	SAN ANTONIO	Medina Lake	Nueces	65,830	1910	irrigation	No	No
2131	BMA WCID	SAN ANTONIO	Medina Lake	Nueces	2,000	1912	irrigation	No	No
5489	Jess Womack	SAN ANTONIO	Elm Bayou	Guadalupe	750	1994	wetland	No[6]	No
2466	Nueces County WCID #3	NUECES	Nueces River	Nueces-Rio Grande	8,606	1909	municipal/irrigation	No	No
					2,940	1921		No	No
2464	City of Corpus Christi	NUECES	Lake Corpus Christi	Nueces-Rio Grande	675	1913	municipal	No	No
					4,054	1914	municipal	No	No
					300,026	1925	municipal/industrial	No	No
4092	City of Taft	NUECES	Taft Drainage Ditch	San Antonio-Nueces	600	1983	irrigation	No	No
5736	City of Corpus Christi	NUECES	Nueces River	San Antonio-Nueces	8,000	2001	wetland	No	No

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
TCEQ Listing of Interbasin Transfers

Notes:

1. The owner of the water right is the owner listed on the authorizations as available December 31, 2004
2. Some use types may have changed as a result of amendments granted after SB1 1997.
3. It should be noted that many water rights include authorization for interbasin transfer where the amount to be transferred is not specified. If the amount was not specified in the water right, it was assumed that the entire amount would be transferred.
4. This table does not include 9 of the 11 water rights owned by the Brazos River Authority that are authorized to release water to be diverted downstream for subsequent interbasin transfer pursuant to the System Operations Order.
5. Some water rights did not receive a new priority date for the interbasin transfer because the water right was a new appropriation of water and was junior anyway.
6. These water rights were subsequently amended after SB1 for additional exempt authorizations.
7. (E) represents water rights that applied for and were granted exempt interbasin transfers
8. The portion of the water right granted to Corpus Christi was made one day junior to LCRA's rights pursuant to an agreement between the parties.

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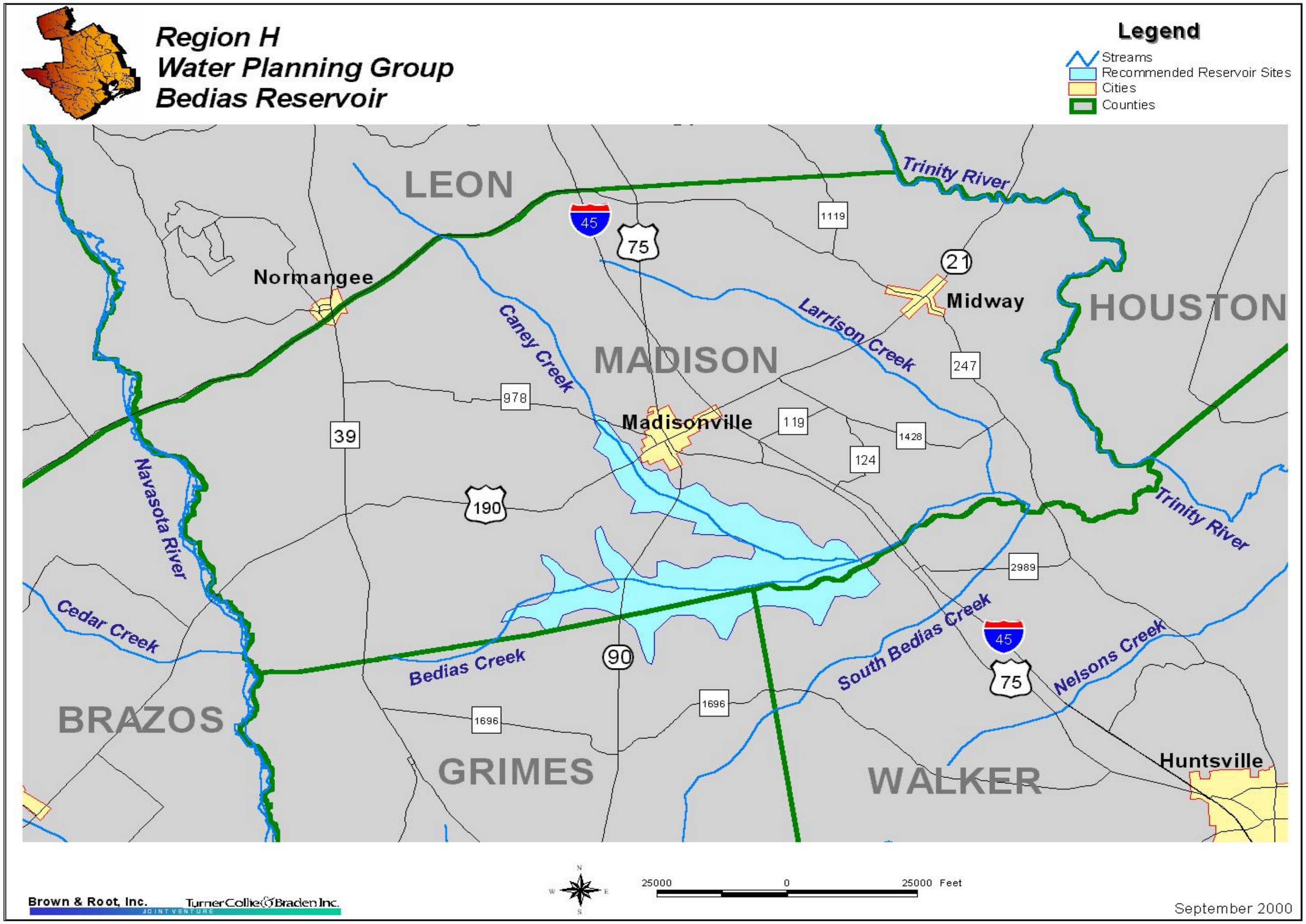
Appendix B, Figure 1
Bedias Reservoir Map
Source: 2001 Region H Water Plan



Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
Comparison of Bedias Reservoir to Alternative Strategies

	Bedias Reservoir		SJRA Contracts		Freeport Desalination (2)	
Total Project Cost (2005 Dollars)	**$**	**150,716,252**	**$**	**-**	**$**	**243,865,778**
Annual Cost (2005 Dollars)						
Operation and Maintenance	$	778,100	$	-	$	28,183,310
Debt Service		5,973,260		-		15,225,989
Water Cost		12,931,695 (1)		7,200,000		-
Total Annual Cost	**$**	**19,683,054**	**$**	**7,200,000**	**$**	**43,409,300**
PV (50 year life)	**$**	**237,219,187**	**$**	**233,493,267**	**$**	**1,160,327,775**
Acre Feet over 50 year life		**1,904,700**		**4,800,000**		**2,520,324**
PV Per Acre Foot	**$**	**125**	**$**	**49**	**$**	**460**

Notes:
(1) Reservoir Debt Service and O&M
(2) Considers only water production, exclusive of any conveyance costs

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Bedias Reservoir Interbasin Transfer Cost Escalation

		2002		2005 [1]		2025 [1]
CONSTRUCTION COST SUMMARY (CONVEYANCE)						
Pump Stations	$	13,939,711	$	15,824,090	$	29,006,581
Pipelines		32,472,000		36,861,586		67,569,673
Pipeline Crossing		847,500		962,066		1,763,529
Stilling Basins		375,348		426,088		781,046
TOTAL CONSTRUCTION COST SUMMARY (CONVEYANCE)	**$**	**47,634,559**	**$**	**54,073,830**	**$**	**99,120,829**
PROJECT COST SUMMARY						
Construction (Capital) Cost - Conveyance Only	$	47,634,559	$	54,073,830	$	99,120,829
Engineering, Financial & Legal services, and Contingencies [2]		15,006,121		17,034,658		31,225,630
Land & Easements		2,820,000		3,201,209		5,868,024
Environmental - Studies and Mitigation		1,500,000		1,702,771		3,121,289
CONSTRUCTION TOTAL	**$**	**66,960,680**	**$**	**76,012,468**	**$**	**139,335,773**
Interest During Construction [3]	**$**	**5,469,124**	**$**	**6,208,444**	**$**	**11,380,479**
TOTAL CAPITAL COST	**$**	**72,429,804**	**$**	**82,220,912**	**$**	**150,716,252**
ANNUAL COSTS						
OPERATION & MAINTENANCE COST SUMMARY [4]						
Reservoir O&M [5]	$	1,445,000	$	1,578,991	$	2,851,833
Pump Stations		348,493		395,602		725,165
Pipelines		324,720		368,616		675,697
Pipeline Crossings		8,475		9,621		17,635
Stilling Basins		3,753		4,261		7,810
ANNUAL OPERATION & MAINTENANCE COST	**$**	**2,130,441**	**$**	**2,357,090**	**$**	**4,278,140**
Reservoir Debt Service	**$**	**10,366,273**	**$**	**11,352,704**	**$**	**20,810,241**
Debt Service		**5,261,946**		**5,973,260**		**10,949,372**

Notes:
(1) All costs are inflated based upon factors contained in the Construction Cost Index History by ENR (Engineering News-Record) unless otherwise noted
(2) Calculated by applying 30% to pipeline costs and 35% to pump station and stilling basin costs
(3) Interest During Construction calculated by applying the same percentage used to calculate Interest During Construction in 2002
(4) Calculated using percentages given in "Bedias Cost Summary" in the TWDB Region H Report unless otherwise noted
(5) Escalated utilizing a 3% general inflation factor

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Bedias Reservoir Interbasin Transfer Present Value Calculation

			Source Cost			
Year	Debt Service	Convayence O&M (1)	Debt Service (2)	Reservoir O&M (1)	Total	PV (3)
2005	$ -	$ -	$ -	$ -	$ -	$ -
2006	-	-	-	-	-	-
2007	-	-	-	-	-	-
2008	-	-	-	-	-	-
2009	-	-	-	-	-	-
2010	-	-	-	-	-	-
2011	-	-	-	-	-	-
2012	-	-	-	-	-	-
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	-	-	-	-	-	-
2016	-	-	-	-	-	-
2017	-	-	-	-	-	-
2018	-	-	-	-	-	-
2019	-	-	-	-	-	-
2020	-	-	-	-	-	-
2021	-	-	-	-	-	-
2022	-	-	-	-	-	-
2023	-	-	-	-	-	-
2024	-	-	-	-	-	-
2025	10,949,372	2,222,140	20,810,241	2,851,833	36,833,585	13,882,191
2026	10,949,372	2,288,804	20,810,241	2,937,387	36,985,805	13,275,772
2027	10,949,372	2,357,468	20,810,241	3,025,509	37,142,590	12,697,190
2028	10,949,372	2,428,192	20,810,241	3,116,274	37,304,080	12,145,138
2029	10,949,372	2,501,038	20,810,241	3,209,763	37,470,414	11,618,373
2030	10,949,372	2,576,069	20,810,241	3,306,055	37,641,738	11,115,709
2031	10,949,372	2,653,351	20,810,241	3,405,237	37,818,201	10,636,019
2032	10,949,372	2,732,952	20,810,241	3,507,394	37,999,959	10,178,225
2033	10,949,372	2,814,940	20,810,241	3,612,616	38,187,169	9,741,304
2034	10,949,372	2,899,388	20,810,241	3,720,995	38,379,996	9,324,279
2035	10,949,372	2,986,370	20,810,241	3,832,624	38,578,608	8,926,220
2036	10,949,372	3,075,961	20,810,241	3,947,603	38,783,177	8,546,241
2037	10,949,372	3,168,240	20,810,241	4,066,031	38,993,884	8,183,497
2038	10,949,372	3,263,287	20,810,241	4,188,012	39,210,913	7,837,185
2039	10,949,372	3,361,186	20,810,241	4,313,653	39,434,452	7,506,537
2040	10,949,372	3,462,021	20,810,241	4,443,062	39,664,697	7,190,824
2041	10,949,372	3,565,882	20,810,241	4,576,354	39,901,849	6,889,350
2042	10,949,372	3,672,859	20,810,241	4,713,645	40,146,116	6,601,452
2043	10,949,372	3,783,044	20,810,241	4,855,054	40,397,711	6,326,498
2044	10,949,372	3,896,536	20,810,241	5,000,706	40,656,854	6,063,887
2045	10,949,372	4,013,432	20,810,241	5,150,727	40,923,772	5,813,045
2046	10,949,372	4,133,835	20,810,241	5,305,249	41,198,696	5,573,426
2047	10,949,372	4,257,850	20,810,241	5,464,406	41,481,869	5,344,508
2048	10,949,372	4,385,585	20,810,241	5,628,338	41,773,536	5,125,797
2049	10,949,372	4,517,153	20,810,241	5,797,188	42,073,954	4,916,818
2050	10,949,372	4,652,667	20,810,241	5,971,104	42,383,384	4,717,123
2051	10,949,372	4,792,247	20,810,241	6,150,237	42,702,098	4,526,280
2052	10,949,372	4,936,015	20,810,241	6,334,744	43,030,372	4,343,882
2053	10,949,372	5,084,095	20,810,241	6,524,787	43,368,495	4,169,539
2054	10,949,372	5,236,618	20,810,241	6,720,530	43,716,761	4,002,878
Total						$ 237,219,187

Acre-Feet / year	63,490
Years	30
Total Acre-Feet	1,904,700
PV / acre-foot	**$ 124.54**

Notes:
(1) Inflated by General Inflation of 3%
(2) Debt Service associated with the reservoir calculated for 30 years at 6%
(3) Mid-year convention applied to PV calculation

Texas Water Development Board
Socioeconomic Impact of Major Interbasin Transfers in Texas
Additional SJRA Contracts Present Value Calculation

Year	Source Cost [1]	Total	PV [2]
2005	$ 7,200,000	$ 7,200,000	$ 7,200,000
2006	7,416,000	7,416,000	7,062,857
2007	7,638,480	7,638,480	6,928,327
2008	7,867,634	7,867,634	6,796,358
2009	8,103,663	8,103,663	6,666,904
2010	8,346,773	8,346,773	6,539,915
2011	8,597,177	8,597,177	6,415,345
2012	8,855,092	8,855,092	6,293,148
2013	9,120,745	9,120,745	6,173,279
2014	9,394,367	9,394,367	6,055,693
2015	9,676,198	9,676,198	5,940,346
2016	9,966,484	9,966,484	5,827,197
2017	10,265,478	10,265,478	5,716,202
2018	10,573,443	10,573,443	5,607,322
2019	10,890,646	10,890,646	5,500,516
2020	11,217,365	11,217,365	5,395,745
2021	11,553,886	11,553,886	5,292,968
2022	11,900,503	11,900,503	5,192,150
2023	12,257,518	12,257,518	5,093,252
2024	12,625,244	12,625,244	4,996,238
2025	13,004,001	13,004,001	4,901,071
2026	13,394,121	13,394,121	4,807,717
2027	13,795,945	13,795,945	4,716,142
2028	14,209,823	14,209,823	4,626,311
2029	14,636,118	14,636,118	4,538,190
2030	15,075,201	15,075,201	4,451,749
2031	15,527,457	15,527,457	4,366,953
2032	15,993,281	15,993,281	4,283,773
2033	16,473,079	16,473,079	4,202,178
2034	16,967,272	16,967,272	4,122,136
2035	17,476,290	17,476,290	4,043,619
2036	18,000,578	18,000,578	3,966,598
2037	18,540,596	18,540,596	3,891,044
2038	19,096,814	19,096,814	3,816,929
2039	19,669,718	19,669,718	3,744,225
2040	20,259,810	20,259,810	3,672,907
2041	20,867,604	20,867,604	3,602,947
2042	21,493,632	21,493,632	3,534,319
2043	22,138,441	22,138,441	3,466,999
2044	22,802,594	22,802,594	3,400,961
2045	23,486,672	23,486,672	3,336,180
2046	24,191,272	24,191,272	3,272,634
2047	24,917,010	24,917,010	3,210,298
2048	25,664,521	25,664,521	3,149,150
2049	26,434,456	26,434,456	3,089,166
2050	27,227,490	27,227,490	3,030,325
2051	28,044,315	28,044,315	2,972,604
2052	28,885,644	28,885,644	2,915,983
2053	29,752,214	29,752,214	2,860,441
2054	30,644,780	30,644,780	2,805,956
Total			$ 233,493,267

Notes:
(1) $45 per acre foot inflated at ##
(2) Mid-year convention applied to PV calculation

Acre Feet/year	96,000
Years	50
Total Acre Feet	4,800,000
PV/ acre foot	**$ 48.64**

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
Escalation of Freeport Desalination Plant Costs

Costs Associated with 10 MGD Plant [1]

	$ / year	$ / 1,000 gal.	Percent of Total	Percentage Commodity	Percentage Capacity	$ Commodity	$ Capacity
Operations and Maintenance Costs							
Chemicals	$ 727,000	$ 0.20	7%	100%	0%	$ 0.20	$ -
Membrane Replacement	241,000	0.07	2%	0%	100%	-	0.07
Power	2,602,000	0.71	25%	100%	0%	0.71	-
Labor	1,192,000	0.33	11%	0%	100%	-	0.33
Maintenance	777,000	0.21	7%	50%	50%	0.11	0.11
Sludge Disposal	861,900	0.24	8%	0%	100%	-	0.24
Miscellaneous	403,000	0.11	4%	73%	27%	0.08	0.03
Total O&M	$ 6,803,900	$ 1.86	65%			$ 1.10	$ 0.77
Debt Service	$ 3,708,100	$ 1.02	35%	0%	100%	$ -	$ 1.02
Total Cost	$ 10,512,000	$ 2.88	100%			$ 1.10	$ 1.78

Costs Associated with 50 MGD Plant

	2004 Dollars $ / 1,000 gal.	2004 Dollars	2005 Dollars	2005 Dollars $ / 1,000 gal	***Estimated 2010***	***Estimated 2010***
Operations and Maintenance Costs						
Chemicals [2]	$ 0.16	$ 2,852,465	$ 3,302,762	$ 0.18	$ 3,867,295	$ 0.21
Membrane Replacement [3]	0.05	945,590	980,355	0.05	1,194,076	0.07
Power [4]	0.56	10,209,236	10,833,442	0.59	13,549,669	0.74
Labor [5]	0.26	4,676,944	4,814,781	0.26	5,646,079	0.31
Maintenance [6]	0.17	3,048,646	3,140,105	0.17	3,640,243	0.20
Sludge Disposal [6]	0.19	3,381,760	3,483,213	0.19	4,037,999	0.22
Miscellaneous [6]	0.09	1,581,215	1,628,652	0.09	1,888,054	0.10
Total O&M	$ 1.46	$ 26,695,858	$ 28,183,310	$ 1.54	$ 33,823,414	$ 1.85
Debt Service [7]	$ 0.80	$ 14,549,142	15,225,989	0.83	$ 17,716,583	$ 0.97
Total Cost	$ 2.26	$ 41,245,000	$ 43,409,300	$ 2.38	**$ 51,539,997**	$ 2.82

Notes:

(1) Source: Freeport Seawater Desalination Project Final Report prepared by CDM, available at www.twdb.state.tx.us

(2) Escalated using Producer Price Index, Industrial Chemicals

(3) Escalated using Handy-Whitman Index of Public Utility Construction Costs for Water Utilities, Account 320 - Large Treatment Plant Equipment

(4) Escalated using Producer Price Index, Industrial Electrical Power

(5) Escalated using Employment Cost Index, Service Providing Industries - Trade, Transposrtation, and Utilities

(6) Escalated utilizing general 3% inflation factor

(7) Escalated using Engineering News Record Construction Cost Index

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
Freeport Desalination Present Value Calculation (1)(2)

Year	Debt Service	Chemicals (3)	Membrane Replacement (4)	Power (5)	Labor (6)	Maintenance (7)	Sludge Disposal (7)	Miscellaneous (7)	Total Cost of Water	Present Value
2005	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2006	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-
2010	17,716,583	3,867,295	1,194,076	13,549,669	5,646,079	3,640,243	4,037,999	1,888,054	51,539,997	40,382,936
2011	17,716,583	3,991,291	1,242,115	14,169,715	5,828,825	3,749,450	4,159,139	1,944,695	52,801,813	39,401,526
2012	17,716,583	4,119,262	1,292,086	14,818,136	6,017,486	3,861,933	4,283,913	2,003,036	54,112,435	38,456,697
2013	17,716,583	4,251,336	1,344,068	15,496,228	6,212,253	3,977,791	4,412,430	2,063,127	55,473,817	37,546,863
2014	17,716,583	4,387,644	1,398,141	16,205,351	6,413,324	4,097,125	4,544,803	2,125,021	56,887,993	36,670,508
2015	17,716,583	4,528,323	1,454,390	16,946,924	6,620,904	4,220,039	4,681,147	2,188,772	58,357,082	35,826,186
2016	17,716,583	4,673,512	1,512,901	17,722,433	6,835,202	4,346,640	4,821,582	2,254,435	59,883,288	35,012,518
2017	17,716,583	4,823,357	1,573,766	18,533,429	7,056,436	4,477,039	4,966,229	2,322,068	61,468,908	34,228,188
2018	17,716,583	4,978,006	1,637,080	19,381,537	7,284,831	4,611,350	5,115,216	2,391,730	63,116,335	33,471,940
2019	17,716,583	5,137,613	1,702,942	20,268,456	7,520,619	4,749,691	5,268,673	2,463,482	64,828,058	32,742,575
2020	17,716,583	5,302,338	1,771,453	21,195,961	7,764,038	4,892,182	5,426,733	2,537,386	66,606,673	32,038,949
2021	17,716,583	5,472,345	1,842,720	22,165,909	8,015,336	5,038,947	5,589,535	2,613,508	68,454,882	31,359,970
2022	17,716,583	5,647,802	1,916,854	23,180,243	8,274,767	5,190,115	5,757,221	2,691,913	70,375,499	30,704,597
2023	17,716,583	5,828,885	1,993,971	24,240,994	8,542,596	5,345,819	5,929,937	2,772,671	72,371,456	30,071,835
2024	17,716,583	6,015,773	2,074,190	25,350,287	8,819,093	5,506,193	6,107,835	2,855,851	74,445,806	29,460,733
2025	17,716,583	6,208,654	2,157,637	26,510,341	9,104,540	5,671,379	6,291,071	2,941,526	76,601,731	28,870,387
2026	17,716,583	6,407,719	2,244,440	27,723,481	9,399,225	5,841,521	6,479,803	3,029,772	78,842,544	28,299,929
2027	17,716,583	6,613,167	2,334,736	28,992,135	9,703,449	6,016,766	6,674,197	3,120,665	81,171,699	27,748,535
2028	17,716,583	6,825,202	2,428,665	30,318,844	10,017,520	6,197,269	6,874,423	3,214,285	83,592,791	27,215,414
2029	17,716,583	7,044,035	2,526,372	31,706,265	10,341,756	6,383,187	7,080,655	3,310,714	86,109,568	26,699,814
2030	17,716,583	7,269,884	2,628,010	33,157,175	10,676,487	6,574,683	7,293,075	3,410,035	88,725,933	26,201,014
2031	17,716,583	7,502,975	2,733,738	34,674,481	11,022,051	6,771,923	7,511,867	3,512,336	91,445,955	25,718,328
2032	17,716,583	7,743,540	2,843,718	36,261,220	11,378,801	6,975,081	7,737,223	3,617,706	94,273,873	25,251,098
2033	17,716,583	7,991,817	2,958,124	37,920,570	11,747,097	7,184,334	7,969,340	3,726,237	97,214,102	24,798,699
2034	17,716,583	8,248,055	3,077,132	39,655,853	12,127,315	7,399,864	8,208,420	3,838,025	100,271,246	24,360,530
2035	17,716,583	8,512,508	3,200,928	41,470,545	12,519,838	7,621,860	8,454,673	3,953,165	103,450,099	23,936,020
2036	17,716,583	8,785,441	3,329,704	43,368,278	12,925,067	7,850,515	8,708,313	4,071,760	106,755,661	23,524,621
2037	17,716,583	9,067,124	3,463,661	45,352,854	13,343,411	8,086,031	8,969,562	4,193,913	110,193,139	23,125,812
2038	17,716,583	9,357,839	3,603,007	47,428,246	13,775,296	8,328,612	9,238,649	4,319,730	113,767,962	22,739,092
2039	17,716,583	9,657,875	3,747,959	49,598,610	14,221,159	8,578,470	9,515,809	4,449,322	117,485,788	22,363,984
2040	-	9,967,531	3,898,743	51,868,292	14,681,454	8,835,824	9,801,283	4,582,802	103,635,929	18,788,187
2041	-	10,287,115	4,055,593	54,241,837	15,156,647	9,100,899	10,095,321	4,720,286	107,657,699	18,587,900
2042	-	10,616,946	4,218,753	56,723,998	15,647,221	9,373,926	10,398,181	4,861,895	111,840,920	18,390,632
2043	-	10,957,352	4,388,478	59,319,745	16,153,673	9,655,144	10,710,126	5,007,751	116,192,269	18,196,333
2044	-	11,308,672	4,565,030	62,034,276	16,676,517	9,944,798	11,031,430	5,157,984	120,718,708	18,004,950
2045	-	11,671,257	4,748,685	64,873,027	17,216,285	10,243,142	11,362,373	5,312,724	125,427,492	17,816,434
2046	-	12,045,467	4,939,729	67,841,682	17,773,522	10,550,436	11,703,244	5,472,105	130,326,186	17,630,735
2047	-	12,431,675	5,138,459	70,946,185	18,348,796	10,866,949	12,054,342	5,636,268	135,422,674	17,447,806
2048	-	12,830,265	5,345,184	74,192,753	18,942,690	11,192,958	12,415,972	5,805,356	140,725,179	17,267,599
2049	-	13,241,636	5,560,226	77,587,888	19,555,806	11,528,746	12,788,451	5,979,517	146,242,271	17,090,067
2050	-	13,666,196	5,783,919	81,138,388	20,188,767	11,874,609	13,172,105	6,158,903	151,982,886	16,915,165
2051	-	14,104,369	6,016,611	84,851,362	20,842,215	12,230,847	13,567,268	6,343,670	157,956,341	16,742,847
2052	-	14,556,591	6,258,665	88,734,245	21,516,813	12,597,772	13,974,286	6,533,980	164,172,351	16,573,070
2053	-	15,023,312	6,510,456	92,794,813	22,213,245	12,975,706	14,393,514	6,729,999	170,641,046	16,405,790
2054	-	15,504,997	6,772,378	97,041,197	22,932,219	13,364,977	14,825,320	6,931,899	177,372,987	16,240,965

Total Present Value	$ 1,160,327,775
Total Years in Operation	45
Acre / Feet produced per Year	56,007
Total Yield	2,520,324
Present Value per Acre Foot	**$ 460.39**

Notes:
(1) Calculated assuming 56,007 acre/feet annual firm yield
(2) Discount Rate Equivalent to (2005 Nominal Treasury 30-year Interest Rate), Discounted utilizing mid-year convention
(3) Escalated using Producer Price Index, Industrial Chemicals
(4) Escalated using Handy-Whitman Index of Public Utility Construction Costs for Water Utilities, Account 320 - Large Treatment Plant Equipment
(5) Escalated using Producer Price Index, Industrial Electrical Power
(6) Escalated using Employment Cost Index, Service Providing Industries - Trade, Transposrtation, and Utilities
(7) Escalated utilizing general 3% inflation factor

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Socioeconomic Impact of Bedias Reservoir Interbasin Transfer
Present Value Summary

Basin of Origin Impacts		
Loss of Commerce from Farm Production:		
Acreage within Lake	$	52,139,856
Acreage for Lake Development		35,681,057
Acreage for Mitigation		190,112,815
Loss of Government Income for Agricultural Subsidies:		
Acreage within Lake		297,478
Acreage for Lake Development		203,574
Acreage for Mitigation		1,084,665
Loss of Commerce from Forestry:		
Acreage within Lake		72,496,976
Acreage for Lake Development		44,733,126
Acreage for Mitigation		312,147,609
Total Impacts (discounted)	**$**	**708,897,156**
Basin of Origin Benefits		
Construction: Local Payroll & Materials	$	401,473
Commerce from Lake visitors		296,806,376
Commerce from New Residents		1,164,118,532
Total Benefits (discounted)	**$**	**1,461,326,381**
Basin of Destination Benefits (Montgomery County)		
Construction: Local Payroll	$	3,602,603
Commerce from New Residents (Montgomery County)		67,478,558,415
Total Benefits Montgomery County (discounted)	**$**	**67,482,161,018**
TOTAL NET ECONOMIC IMPACT (discounted to Year 2005)	**$**	**68,234,590,243**

ANNUAL CALCULATION

	$-Value per year		Multiplier effect (ME)	$-Value per year w/ ME	Year of Value	First Year of Impact	Last Year of Impact
Basin of Origin Impacts							
Loss of Commerce from Farm Production:							
Acreage within Lake							
Grimes County	$ 226,665		1.16	$ 262,027	2005	2010	2054
Madison County	1,242,040		1.16	1,444,914	2005	2010	2054
Walker County	229,689		1.21	277,733	2005	2010	2054
Subtotal	**$ 1,698,394**			**$ 1,984,674**			
Acreage for Lake Development							
Grimes County	$ 487,996		1.16	$ 564,129	2005	2015	2054
Madison County	2,674,039		1.16	3,110,815	2005	2015	2054
Walker County	494,506		1.21	597,942	2005	2015	2054
Subtotal	**$ 3,656,542**			**$ 4,272,887**			
Acreage for Mitigation							
Grimes County	$ 826,467		1.16	$ 955,406	2005	2010	2054
Madison County	4,528,738		1.16	5,268,460	2005	2010	2054
Walker County	837,493		1.21	1,012,672	2005	2010	2054
Subtotal	**$ 6,192,698**			**$ 7,236,538**			
Loss of Government Income for Agricultural Subsidies:							
Acreage within Lake							
Grimes County	$ 3,046		1.16	$ 3,522	2005	2010	2054
Madison County	5,523		1.16	6,425	2005	2010	2054
Walker County	1,139		1.21	1,377	2005	2010	2054
Subtotal	**$ 9,708**			**$ 11,323**			
Acreage for Lake Development							
Grimes County	$ 6,558		1.16	$ 7,582	2005	2015	2054
Madison County	11,890		1.16	13,833	2005	2015	2054
Walker County	2,451		1.21	2,964	2005	2015	2054
Subtotal	**$ 20,900**			**$ 24,378**			
Acreage for Mitigation							
Grimes County	$ 11,107		1.16	$ 12,840	2005	2010	2054
Madison County	20,138		1.16	23,427	2005	2010	2054
Walker County	4,152		1.21	5,020	2005	2010	2054
Subtotal	**$ 35,397**			**$ 41,287**			
Loss of Commerce for Forestry Products:							
Acreage within Lake							
Grimes County	$ 838,983		1.16	$ 969,875	2005	2010	2054
Madison County	1,426,272		1.16	1,659,238	2005	2020	2054
Walker County	531,356		1.21	642,500	2005	2010	2054
Subtotal	**$ 2,796,612**			**$ 3,271,614**			
Acreage for Lake Development							
Grimes County	$ 1,806,282		1.16	$ 2,088,084	2005	2015	2054
Madison County	3,070,679		1.16	3,572,243	2005	2025	2054
Walker County	1,143,979		1.21	1,383,265	2005	2015	2054
Subtotal	**$ 6,020,940**			**$ 7,043,592**			
Acreage for Mitigation							
Grimes County	$ 3,612,381		1.16	$ 4,175,956	2005	2010	2054
Madison County	6,141,047		1.16	7,144,123	2005	2020	2054
Walker County	2,287,841		1.21	2,766,389	2005	2010	2054
Subtotal	**$ 12,041,269**			**$ 14,086,468**			
Total Impacts							

ANNUAL CALCULATION

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Basin of Origin Impacts														
Loss of Commerce from Farm Production:														
Acreage within Lake														
Grimes County	$ 75,940	$ 156,437	$ 241,695	$ 331,928	$ 341,886	$ 352,143	$ 362,707	$ 373,588	$ 384,796	$ 396,340	$ 408,230	$ 420,477	$ 433,091	$ 446,084
Madison County	418,763	862,652	1,332,797	1,830,374	1,885,285	1,941,844	2,000,099	2,060,102	2,121,905	2,185,563	2,251,129	2,318,663	2,388,223	2,459,870
Walker County	80,492	165,814	256,182	351,824	362,378	373,250	384,447	395,981	407,860	420,096	432,699	445,680	459,050	472,822
Subtotal	**$ 575,195**	**$ 1,184,902**	**$ 1,830,674**	**$ 2,514,126**	**$ 2,589,550**	**$ 2,667,236**	**$ 2,747,253**	**$ 2,829,671**	**$ 2,914,561**	**$ 3,001,998**	**$ 3,092,058**	**$ 3,184,820**	**$ 3,280,364**	**$ 3,378,775**
Acreage for Lake Development														
Grimes County	$ -	$ -	$ -	$ -	$ -	$ 15,163	$ 31,235	$ 48,259	$ 66,275	$ 85,330	$ 105,467	$ 126,737	$ 149,187	$ 172,871
Madison County	-	-	-	-	-	83,614	172,244	266,117	365,467	470,539	581,586	698,872	822,673	953,272
Walker County	-	-	-	-	-	16,072	33,108	51,151	70,248	90,444	111,789	134,333	158,129	183,232
Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 114,848**	**$ 236,587**	**$ 365,527**	**$ 501,990**	**$ 646,313**	**$ 798,842**	**$ 959,942**	**$ 1,129,989**	**$ 1,309,375**
Acreage for Mitigation														
Grimes County	$ 276,894	$ 570,402	$ 881,272	$ 1,210,280	$ 1,246,588	$ 1,283,986	$ 1,322,505	$ 1,362,181	$ 1,403,046	$ 1,445,137	$ 1,488,491	$ 1,533,146	$ 1,579,141	$ 1,626,515
Madison County	1,526,897	3,145,408	4,859,656	6,673,927	6,874,145	7,080,369	7,292,780	7,511,564	7,736,911	7,969,018	8,208,088	8,454,331	8,707,961	8,969,200
Walker County	293,491	604,592	934,094	1,282,823	1,321,307	1,360,947	1,401,775	1,443,828	1,487,143	1,531,757	1,577,710	1,625,041	1,673,793	1,724,006
Subtotal	**$ 2,097,283**	**$ 4,320,402**	**$ 6,675,021**	**$ 9,167,029**	**$ 9,442,040**	**$ 9,725,302**	**$ 10,017,061**	**$ 10,317,572**	**$ 10,627,100**	**$ 10,945,913**	**$ 11,274,290**	**$ 11,612,519**	**$ 11,960,894**	**$ 12,319,721**
Loss of Government Income for Agricultural Subsidies:														
Acreage within Lake														
Grimes County	$ 1,021	$ 2,102	$ 3,248	$ 4,461	$ 4,595	$ 4,733	$ 4,875	$ 5,021	$ 5,171	$ 5,327	$ 5,486	$ 5,651	$ 5,821	$ 5,995
Madison County	1,862	3,836	5,926	8,139	8,383	8,635	8,894	9,161	9,435	9,718	10,010	10,310	10,620	10,938
Walker County	399	822	1,270	1,744	1,796	1,850	1,906	1,963	2,022	2,082	2,145	2,209	2,276	2,344
Subtotal	**$ 3,282**	**$ 6,760**	**$ 10,445**	**$ 14,344**	**$ 14,774**	**$ 15,218**	**$ 15,674**	**$ 16,144**	**$ 16,629**	**$ 17,128**	**$ 17,641**	**$ 18,171**	**$ 18,716**	**$ 19,277**
Acreage for Lake Development														
Grimes County	$ -	$ -	$ -	$ -	$ -	$ 204	$ 420	$ 649	$ 891	$ 1,147	$ 1,417	$ 1,703	$ 2,005	$ 2,323
Madison County	-	-	-	-	-	372	766	1,183	1,625	2,092	2,586	3,108	3,658	4,239
Walker County	$ -	$ -	$ -	-	-	$ 80	$ 164	$ 254	$ 348	$ 448	$ 554	$ 666	$ 784	$ 908
Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 655**	**$ 1,350**	**$ 2,085**	**$ 2,864**	**$ 3,687**	**$ 4,558**	**$ 5,477**	**$ 6,447**	**$ 7,470**
Acreage for Mitigation														
Grimes County	$ 3,721	$ 7,666	$ 11,844	$ 16,266	$ 16,754	$ 17,256	$ 17,774	$ 18,307	$ 18,856	$ 19,422	$ 20,005	$ 20,605	$ 21,223	$ 21,860
Madison County	6,790	13,986	21,609	29,677	30,567	31,484	32,428	33,401	34,403	35,435	36,498	37,593	38,721	39,883
Walker County	1,455	2,997	4,630	6,359	6,550	6,746	6,949	7,157	7,372	7,593	7,821	8,056	8,297	8,546
Subtotal	**$ 11,966**	**$ 24,650**	**$ 38,084**	**$ 52,301**	**$ 53,870**	**$ 55,487**	**$ 57,151**	**$ 58,866**	**$ 60,632**	**$ 62,451**	**$ 64,324**	**$ 66,254**	**$ 68,241**	**$ 70,289**
Loss of Commerce for Forestry Products:														
Acreage within Lake														
Grimes County	$ 281,088	$ 579,041	$ 894,618	$ 1,228,609	$ 1,265,467	$ 1,303,431	$ 1,342,534	$ 1,382,810	$ 1,424,294	$ 1,467,023	$ 1,511,034	$ 1,556,365	$ 1,603,056	$ 1,651,147
Madison County	-	-	-	-	-	-	-	-	-	-	646,260	1,331,295	2,056,851	2,824,742
Walker County	186,208	383,589	592,646	813,900	838,317	863,466	889,370	916,052	943,533	971,839	1,000,994	1,031,024	1,061,955	1,093,813
Subtotal	**$ 467,296**	**$ 962,630**	**$ 1,487,264**	**$ 2,042,509**	**$ 2,103,784**	**$ 2,166,897**	**$ 2,231,904**	**$ 2,298,861**	**$ 2,367,827**	**$ 2,438,862**	**$ 3,158,288**	**$ 3,918,684**	**$ 4,721,862**	**$ 5,569,703**
Acreage for Lake Development														
Grimes County	$ -	$ -	$ -	$ -	$ -	$ 56,124	$ 115,616	$ 178,627	$ 245,314	$ 315,841	$ 390,380	$ 469,107	$ 552,206	$ 639,868
Madison County	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walker County	$ -	$ -	$ -	-	-	$ 37,180	$ 76,590	$ 118,332	$ 162,510	$ 209,231	$ 258,610	$ 310,763	$ 365,812	$ 423,885
Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 93,304**	**$ 192,206**	**$ 296,959**	**$ 407,823**	**$ 525,073**	**$ 648,990**	**$ 779,869**	**$ 918,018**	**$ 1,063,753**
Acreage for Mitigation														
Grimes County	$ 1,210,269	$ 2,493,155	$ 3,851,924	$ 5,289,976	$ 5,448,675	$ 5,612,136	$ 5,780,500	$ 5,953,915	$ 6,132,532	$ 6,316,508	$ 6,506,003	$ 6,701,184	$ 6,902,219	$ 7,109,286
Madison County	-	-	-	-	-	-	-	-	-	-	2,782,578	5,732,110	8,856,110	12,162,391
Walker County	801,751	1,651,607	2,551,733	3,504,379	3,609,511	3,717,796	3,829,330	3,944,210	4,062,536	4,184,412	4,309,945	4,439,243	4,572,420	4,709,593
Subtotal	**$ 2,012,020**	**$ 4,144,762**	**$ 6,403,657**	**$ 8,794,356**	**$ 9,058,186**	**$ 9,329,932**	**$ 9,609,830**	**$ 9,898,125**	**$ 10,195,068**	**$ 10,500,920**	**$ 13,598,526**	**$ 16,872,536**	**$ 20,330,749**	**$ 23,981,269**
Total Impacts	**$ 5,167,042**	**$ 10,644,106**	**$ 16,445,145**	**$ 22,584,665**	**$ 23,262,205**	**$ 24,168,879**	**$ 25,109,017**	**$ 26,083,811**	**$ 27,094,495**	**$ 28,142,344**	**$ 32,657,517**	**$ 37,418,272**	**$ 42,435,280**	**$ 47,719,633**

ANNUAL CALCULATION

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Basin of Origin Impacts												
Loss of Commerce from Farm Production:												
Acreage within Lake												
Grimes County	$ 459,466	$ 473,250	$ 487,448	$ 502,071	$ 517,133	$ 532,647	$ 548,627	$ 565,086	$ 582,038	$ 599,499	$ 617,484	$ 636,009
Madison County	2,533,666	2,609,676	2,687,966	2,768,605	2,851,663	2,937,213	3,025,330	3,116,090	3,209,572	3,305,859	3,405,035	3,507,186
Walker County	487,006	501,616	516,665	532,165	548,130	564,574	581,511	598,956	616,925	635,433	654,496	674,131
Subtotal	**$ 3,480,139**	**$ 3,584,543**	**$ 3,692,079**	**$ 3,802,841**	**$ 3,916,927**	**$ 4,034,434**	**$ 4,155,467**	**$ 4,280,131**	**$ 4,408,535**	**$ 4,540,791**	**$ 4,677,015**	**$ 4,817,326**
Acreage for Lake Development												
Grimes County	$ 197,841	$ 224,154	$ 251,867	$ 281,042	$ 311,740	$ 344,028	$ 377,972	$ 413,643	$ 451,114	$ 490,461	$ 531,763	$ 575,102
Madison County	1,090,967	1,236,065	1,388,888	1,549,767	1,719,050	1,897,094	2,084,274	2,280,978	2,487,607	2,704,582	2,932,336	3,171,322
Walker County	209,699	237,589	266,964	297,887	330,426	364,648	400,627	438,436	478,153	519,859	563,636	609,573
Subtotal	**$ 1,498,507**	**$ 1,697,808**	**$ 1,907,719**	**$ 2,128,696**	**$ 2,361,215**	**$ 2,605,770**	**$ 2,862,873**	**$ 3,133,056**	**$ 3,416,874**	**$ 3,714,902**	**$ 4,027,735**	**$ 4,355,996**
Acreage for Mitigation												
Grimes County	$ 1,675,310	$ 1,725,570	$ 1,777,337	$ 1,830,657	$ 1,885,576	$ 1,942,144	$ 2,000,408	$ 2,060,420	$ 2,122,233	$ 2,185,900	$ 2,251,477	$ 2,319,021
Madison County	9,238,276	9,515,424	9,800,887	10,094,913	10,397,761	10,709,694	11,030,984	11,361,914	11,702,771	12,053,855	12,415,470	12,787,934
Walker County	1,775,727	1,828,998	1,883,868	1,940,384	1,998,596	2,058,554	2,120,310	2,183,920	2,249,437	2,316,920	2,386,428	2,458,021
Subtotal	**$ 12,689,313**	**$ 13,069,992**	**$ 13,462,092**	**$ 13,865,955**	**$ 14,281,933**	**$ 14,710,391**	**$ 15,151,703**	**$ 15,606,254**	**$ 16,074,442**	**$ 16,556,675**	**$ 17,053,375**	**$ 17,564,976**
Loss of Government Income for Agricultural Subsidies:												
Acreage within Lake												
Grimes County	$ 6,175	$ 6,360	$ 6,551	$ 6,748	$ 6,950	$ 7,159	$ 7,373	$ 7,595	$ 7,822	$ 8,057	$ 8,299	$ 8,548
Madison County	11,266	11,604	11,952	12,311	12,680	13,061	13,453	13,856	14,272	14,700	15,141	15,595
Walker County	2,414	2,487	2,561	2,638	2,717	2,799	2,883	2,969	3,058	3,150	3,244	3,342
Subtotal	**$ 19,856**	**$ 20,451**	**$ 21,065**	**$ 21,697**	**$ 22,348**	**$ 23,018**	**$ 23,709**	**$ 24,420**	**$ 25,152**	**$ 25,907**	**$ 26,684**	**$ 27,485**
Acreage for Lake Development												
Grimes County	$ 2,659	$ 3,013	$ 3,385	$ 3,777	$ 4,190	$ 4,624	$ 5,080	$ 5,559	$ 6,063	$ 6,592	$ 7,147	$ 7,729
Madison County	4,851	5,496	6,176	6,891	7,644	8,436	9,268	10,143	11,061	12,026	13,039	14,102
Walker County	$ 1,040	$ 1,178	$ 1,323	$ 1,477	$ 1,638	$ 1,808	$ 1,986	$ 2,173	$ 2,370	$ 2,577	$ 2,794	$ 3,022
Subtotal	**$ 8,550**	**$ 9,687**	**$ 10,884**	**$ 12,145**	**$ 13,472**	**$ 14,867**	**$ 16,334**	**$ 17,875**	**$ 19,495**	**$ 21,195**	**$ 22,980**	**$ 24,853**
Acreage for Mitigation												
Grimes County	$ 22,515	$ 23,191	$ 23,887	$ 24,603	$ 25,341	$ 26,102	$ 26,885	$ 27,691	$ 28,522	$ 29,378	$ 30,259	$ 31,167
Madison County	41,079	42,312	43,581	44,888	46,235	47,622	49,051	50,522	52,038	53,599	55,207	56,863
Walker County	8,803	9,067	9,339	9,619	9,907	10,205	10,511	10,826	11,151	11,485	11,830	12,185
Subtotal	**$ 72,397**	**$ 74,569**	**$ 76,806**	**$ 79,111**	**$ 81,484**	**$ 83,928**	**$ 86,446**	**$ 89,040**	**$ 91,711**	**$ 94,462**	**$ 97,296**	**$ 100,215**
Loss of Commerce for Forestry Products:												
Acreage within Lake												
Grimes County	$ 1,700,682	$ 1,751,702	$ 1,804,253	$ 1,858,381	$ 1,914,132	$ 1,971,556	$ 2,030,703	$ 2,091,624	$ 2,154,373	$ 2,219,004	$ 2,285,574	$ 2,354,141
Madison County	2,909,485	2,996,769	3,086,672	3,179,272	3,274,650	3,372,890	3,474,077	3,578,299	3,685,648	3,796,217	3,910,104	4,027,407
Walker County	1,126,628	1,160,427	1,195,239	1,231,097	1,268,030	1,306,070	1,345,253	1,385,610	1,427,178	1,469,994	1,514,094	1,559,516
Subtotal	**$ 5,736,794**	**$ 5,908,898**	**$ 6,086,165**	**$ 6,268,750**	**$ 6,456,812**	**$ 6,650,517**	**$ 6,850,032**	**$ 7,055,533**	**$ 7,267,199**	**$ 7,485,215**	**$ 7,709,772**	**$ 7,941,065**
Acreage for Lake Development												
Grimes County	$ 732,294	$ 829,689	$ 932,268	$ 1,040,256	$ 1,153,884	$ 1,273,393	$ 1,399,035	$ 1,531,069	$ 1,669,766	$ 1,815,406	$ 1,968,283	$ 2,128,698
Madison County	-	129,037	265,817	410,687	564,010	726,163	897,538	1,078,541	1,269,597	1,471,146	1,683,645	1,907,569
Walker County	$ 485,113	$ 549,633	$ 617,587	$ 689,124	$ 764,398	$ 843,568	$ 926,800	$ 1,014,267	$ 1,106,147	$ 1,202,628	$ 1,303,902	$ 1,410,170
Subtotal	**$ 1,217,406**	**$ 1,508,359**	**$ 1,815,673**	**$ 2,140,068**	**$ 2,482,292**	**$ 2,843,125**	**$ 3,223,373**	**$ 3,623,877**	**$ 4,045,510**	**$ 4,489,180**	**$ 4,955,829**	**$ 5,446,437**
Acreage for Mitigation												
Grimes County	$ 7,322,564	$ 7,542,241	$ 7,768,508	$ 8,001,564	$ 8,241,610	$ 8,488,859	$ 8,743,525	$ 9,005,830	$ 9,276,005	$ 9,554,285	$ 9,840,914	$ 10,136,141
Madison County	12,527,262	12,903,080	13,290,173	13,688,878	14,099,544	14,522,530	14,958,206	15,406,952	15,869,161	16,345,236	16,835,593	17,340,661
Walker County	4,850,881	4,996,407	5,146,299	5,300,688	5,459,709	5,623,500	5,792,205	5,965,971	6,144,951	6,329,299	6,519,178	6,714,753
Subtotal	**$ 24,700,707**	**$ 25,441,728**	**$ 26,204,980**	**$ 26,991,130**	**$ 27,800,863**	**$ 28,634,889**	**$ 29,493,936**	**$ 30,378,754**	**$ 31,290,117**	**$ 32,228,820**	**$ 33,195,685**	**$ 34,191,555**
Total Impacts	**$ 49,423,668**	**$ 51,316,035**	**$ 53,277,463**	**$ 55,310,392**	**$ 57,417,347**	**$ 59,600,939**	**$ 61,863,872**	**$ 64,208,940**	**$ 66,639,035**	**$ 69,157,147**	**$ 71,766,371**	**$ 74,469,907**

ANNUAL CALCULATION

	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Basin of Origin Impacts												
Loss of Commerce from Farm Production:												
Acreage within Lake												
Grimes County	$ 655,089	$ 674,742	$ 694,984	$ 715,834	$ 737,309	$ 759,428	$ 782,211	$ 805,677	$ 829,847	$ 854,743	$ 880,385	$ 906,797
Madison County	3,612,402	3,720,774	3,832,397	3,947,369	4,065,790	4,187,764	4,313,397	4,442,799	4,576,083	4,713,365	4,854,766	5,000,409
Walker County	694,354	715,185	736,641	758,740	781,502	804,947	829,096	853,968	879,587	905,975	933,154	961,149
Subtotal	**$ 4,961,845**	**$ 5,110,701**	**$ 5,264,022**	**$ 5,421,942**	**$ 5,584,601**	**$ 5,752,139**	**$ 5,924,703**	**$ 6,102,444**	**$ 6,285,517**	**$ 6,474,083**	**$ 6,668,305**	**$ 6,868,354**
Acreage for Lake Development												
Grimes County	$ 620,562	$ 668,233	$ 718,205	$ 770,574	$ 825,439	$ 882,902	$ 943,070	$ 1,006,054	$ 1,071,967	$ 1,140,931	$ 1,213,067	$ 1,288,505
Madison County	3,422,007	3,684,879	3,960,444	4,249,227	4,551,772	4,868,645	5,200,434	5,547,749	5,911,222	6,291,511	6,689,296	7,105,287
Walker County	657,758	708,286	761,253	816,761	874,915	935,822	999,597	1,066,355	1,136,220	1,209,317	1,285,777	1,365,736
Subtotal	**$ 4,700,327**	**$ 5,061,398**	**$ 5,439,902**	**$ 5,836,562**	**$ 6,252,125**	**$ 6,687,369**	**$ 7,143,101**	**$ 7,620,158**	**$ 8,119,409**	**$ 8,641,758**	**$ 9,188,140**	**$ 9,759,528**
Acreage for Mitigation												
Grimes County	$ 2,388,592	$ 2,460,250	$ 2,534,057	$ 2,610,079	$ 2,688,381	$ 2,769,033	$ 2,852,104	$ 2,937,667	$ 3,025,797	$ 3,116,571	$ 3,210,068	$ 3,306,370
Madison County	13,171,572	13,566,719	13,973,721	14,392,933	14,824,721	15,269,462	15,727,546	16,199,373	16,685,354	17,185,914	17,701,492	18,232,537
Walker County	2,531,761	2,607,714	2,685,946	2,766,524	2,849,520	2,935,005	3,023,056	3,113,747	3,207,160	3,303,374	3,402,476	3,504,550
Subtotal	**$ 18,091,926**	**$ 18,634,683**	**$ 19,193,724**	**$ 19,769,536**	**$ 20,362,622**	**$ 20,973,500**	**$ 21,602,705**	**$ 22,250,787**	**$ 22,918,310**	**$ 23,605,859**	**$ 24,314,035**	**$ 25,043,456**
Loss of Government Income for Agricultural Subsidies:												
Acreage within Lake												
Grimes County	$ 8,804	$ 9,068	$ 9,340	$ 9,620	$ 9,909	$ 10,206	$ 10,513	$ 10,828	$ 11,153	$ 11,487	$ 11,832	$ 12,187
Madison County	16,063	16,545	17,041	17,553	18,079	18,621	19,180	19,756	20,348	20,959	21,587	22,235
Walker County	3,442	3,545	3,652	3,761	3,874	3,990	4,110	4,233	4,360	4,491	4,626	4,765
Subtotal	**$ 28,309**	**$ 29,158**	**$ 30,033**	**$ 30,934**	**$ 31,862**	**$ 32,818**	**$ 33,803**	**$ 34,817**	**$ 35,861**	**$ 36,937**	**$ 38,045**	**$ 39,187**
Acreage for Lake Development												
Grimes County	$ 8,340	$ 8,981	$ 9,652	$ 10,356	$ 11,094	$ 11,866	$ 12,674	$ 13,521	$ 14,407	$ 15,334	$ 16,303	$ 17,317
Madison County	15,216	16,385	17,611	18,895	20,240	21,649	23,124	24,669	26,285	27,976	29,745	31,595
Walker County	$ 3,261	$ 3,511	$ 3,774	$ 4,049	$ 4,337	$ 4,639	$ 4,955	$ 5,286	$ 5,632	$ 5,995	$ 6,374	$ 6,770
Subtotal	**$ 26,817**	**$ 28,877**	**$ 31,037**	**$ 33,300**	**$ 35,671**	**$ 38,154**	**$ 40,754**	**$ 43,476**	**$ 46,324**	**$ 49,304**	**$ 52,422**	**$ 55,682**
Acreage for Mitigation												
Grimes County	$ 32,102	$ 33,065	$ 34,057	$ 35,078	$ 36,131	$ 37,215	$ 38,331	$ 39,481	$ 40,665	$ 41,885	$ 43,142	$ 44,436
Madison County	58,569	60,326	62,136	64,000	65,920	67,898	69,935	72,033	74,194	76,420	78,712	81,073
Walker County	12,550	12,927	13,315	13,714	14,126	14,549	14,986	15,435	15,899	16,375	16,867	17,373
Subtotal	**$ 103,221**	**$ 106,318**	**$ 109,507**	**$ 112,793**	**$ 116,176**	**$ 119,662**	**$ 123,252**	**$ 126,949**	**$ 130,758**	**$ 134,680**	**$ 138,721**	**$ 142,882**
Loss of Commerce for Forestry Products:												
Acreage within Lake												
Grimes County	$ 2,424,766	$ 2,497,509	$ 2,572,434	$ 2,649,607	$ 2,729,095	$ 2,810,968	$ 2,895,297	$ 2,982,156	$ 3,071,621	$ 3,163,769	$ 3,258,682	$ 3,356,443
Madison County	4,148,229	4,272,676	4,400,856	4,532,882	4,668,869	4,808,935	4,953,203	5,101,799	5,254,853	5,412,498	5,574,873	5,742,119
Walker County	1,606,302	1,654,491	1,704,126	1,755,249	1,807,907	1,862,144	1,918,008	1,975,549	2,034,815	2,095,860	2,158,735	2,223,497
Subtotal	**$ 8,179,297**	**$ 8,424,676**	**$ 8,677,416**	**$ 8,937,738**	**$ 9,205,871**	**$ 9,482,047**	**$ 9,766,508**	**$ 10,059,503**	**$ 10,361,288**	**$ 10,672,127**	**$ 10,992,291**	**$ 11,322,060**
Acreage for Lake Development												
Grimes County	$ 2,296,966	$ 2,473,415	$ 2,658,383	$ 2,852,224	$ 3,055,302	$ 3,267,998	$ 3,490,706	$ 3,723,836	$ 3,967,811	$ 4,223,073	$ 4,490,081	$ 4,769,308
Madison County	2,143,414	2,391,693	2,652,940	2,927,709	3,216,576	3,520,140	3,839,023	4,173,872	4,525,355	4,894,172	5,281,045	5,686,725
Walker County	$ 1,521,640	$ 1,638,530	$ 1,761,064	$ 1,889,474	$ 2,024,005	$ 2,164,907	$ 2,312,441	$ 2,466,879	$ 2,628,502	$ 2,797,603	$ 2,974,483	$ 3,159,459
Subtotal	**$ 5,962,021**	**$ 6,503,638**	**$ 7,072,387**	**$ 7,669,407**	**$ 8,295,883**	**$ 8,953,045**	**$ 9,642,171**	**$ 10,364,586**	**$ 11,121,669**	**$ 11,914,848**	**$ 12,745,609**	**$ 13,615,492**
Acreage for Mitigation												
Grimes County	$ 10,440,226	$ 10,753,432	$ 11,076,035	$ 11,408,316	$ 11,750,566	$ 12,103,083	$ 12,466,175	$ 12,840,161	$ 13,225,365	$ 13,622,126	$ 14,030,790	$ 14,451,714
Madison County	17,860,881	18,396,707	18,948,608	19,517,066	20,102,578	20,705,656	21,326,825	21,966,630	22,625,629	23,304,398	24,003,530	24,723,636
Walker County	6,916,196	7,123,682	7,337,392	7,557,514	7,784,239	8,017,767	8,258,300	8,506,049	8,761,230	9,024,067	9,294,789	9,573,633
Subtotal	**$ 35,217,302**	**$ 36,273,821**	**$ 37,362,036**	**$ 38,482,897**	**$ 39,637,384**	**$ 40,826,505**	**$ 42,051,300**	**$ 43,312,839**	**$ 44,612,225**	**$ 45,950,591**	**$ 47,329,109**	**$ 48,748,982**
Total Impacts	**$ 77,271,065**	**$ 80,173,270**	**$ 83,180,063**	**$ 86,295,108**	**$ 89,522,194**	**$ 92,865,239**	**$ 96,328,297**	**$ 99,915,559**	**$ 103,631,362**	**$ 107,480,189**	**$ 111,466,677**	**$ 115,595,623**

ANNUAL CALCULATION

	2048	2049	2050	2051	2052	2053	2054	Total
Basin of Origin Impacts								
Loss of Commerce from Farm Production:								
Acreage within Lake								
Grimes County	$ 934,000	$ 962,020	$ 990,881	$ 1,020,608	$ 1,051,226	$ 1,082,762	$ 1,115,245	$ 27,699,889
Madison County	5,150,421	5,304,934	5,464,082	5,628,004	5,796,844	5,970,750	6,149,872	152,747,354
Walker County	989,983	1,019,683	1,050,273	1,081,782	1,114,235	1,147,662	1,182,092	29,360,190
Subtotal	**$ 7,074,405**	**$ 7,286,637**	**$ 7,505,236**	**$ 7,730,393**	**$ 7,962,305**	**$ 8,201,174**	**$ 8,447,210**	**$ 209,807,432**
Acreage for Lake Development								
Grimes County	$ 1,367,377	$ 1,449,821	$ 1,535,982	$ 1,626,008	$ 1,720,053	$ 1,818,277	$ 1,920,846	$ 27,839,119
Madison County	7,540,217	7,994,847	8,469,970	8,966,404	9,485,002	10,026,645	10,592,251	153,515,121
Walker County	1,449,336	1,536,722	1,628,047	1,723,469	1,823,151	1,927,262	2,035,980	29,507,765
Subtotal	**$ 10,356,929**	**$ 10,981,391**	**$ 11,633,999**	**$ 12,315,881**	**$ 13,028,205**	**$ 13,772,184**	**$ 14,549,076**	**$ 210,862,005**
Acreage for Mitigation								
Grimes County	$ 3,405,561	$ 3,507,728	$ 3,612,960	$ 3,721,348	$ 3,832,989	$ 3,947,978	$ 4,066,418	$ 100,999,586
Madison County	18,779,513	19,342,898	19,923,185	20,520,881	21,136,507	21,770,602	22,423,720	556,948,787
Walker County	3,609,686	3,717,977	3,829,516	3,944,402	4,062,734	4,184,616	4,310,154	107,053,390
Subtotal	**$ 25,794,760**	**$ 26,568,603**	**$ 27,365,661**	**$ 28,186,631**	**$ 29,032,230**	**$ 29,903,196**	**$ 30,800,292**	**$ 765,001,763**
Loss of Government Income for Agricultural Subsidies:								
Acreage within Lake								
Grimes County	$ 12,553	$ 12,929	$ 13,317	$ 13,717	$ 14,128	$ 14,552	$ 14,988	$ 372,274
Madison County	22,902	23,589	24,297	25,026	25,776	26,550	27,346	679,212
Walker County	4,908	5,055	5,206	5,363	5,523	5,689	5,860	145,544
Subtotal	**$ 40,362**	**$ 41,573**	**$ 42,820**	**$ 44,105**	**$ 45,428**	**$ 46,791**	**$ 48,195**	**$ 1,197,031**
Acreage for Lake Development								
Grimes County	$ 18,377	$ 19,485	$ 20,643	$ 21,853	$ 23,117	$ 24,437	$ 25,815	$ 374,146
Madison County	33,529	35,550	37,663	39,870	42,176	44,585	47,100	682,626
Walker County	$ 7,185	$ 7,618	$ 8,071	$ 8,544	$ 9,038	$ 9,554	$ 10,093	146,276
Subtotal	**$ 59,090**	**$ 62,653**	**$ 66,376**	**$ 70,267**	**$ 74,331**	**$ 78,576**	**$ 83,008**	**$ 1,203,047**
Acreage for Mitigation								
Grimes County	$ 45,769	$ 47,142	$ 48,557	$ 50,013	$ 51,514	$ 53,059	$ 54,651	$ 1,357,390
Madison County	83,506	86,011	88,591	91,249	93,986	96,806	99,710	2,476,549
Walker County	17,894	18,431	18,984	19,553	20,140	20,744	21,366	530,685
Subtotal	**$ 147,169**	**$ 151,584**	**$ 156,131**	**$ 160,815**	**$ 165,640**	**$ 170,609**	**$ 175,727**	**$ 4,364,624**
Loss of Commerce for Forestry Products:								
Acreage within Lake								
Grimes County	$ 3,457,136	$ 3,560,850	$ 3,667,676	$ 3,777,706	$ 3,891,037	$ 4,007,768	$ 4,128,001	$ 102,529,161
Madison County	5,914,383	6,091,814	6,274,569	6,462,806	6,656,690	6,856,391	7,062,083	152,341,167
Walker County	2,290,202	2,358,908	2,429,676	2,502,566	2,577,643	2,654,972	2,734,621	67,921,116
Subtotal	**$ 11,661,721**	**$ 12,011,573**	**$ 12,371,920**	**$ 12,743,078**	**$ 13,125,370**	**$ 13,519,131**	**$ 13,924,705**	**$ 322,791,444**
Acreage for Lake Development								
Grimes County	$ 5,061,247	$ 5,366,410	$ 5,685,329	$ 6,018,552	$ 6,366,652	$ 6,730,221	$ 7,109,875	$ 103,044,512
Madison County	6,111,993	6,557,659	7,024,564	7,513,582	8,025,619	8,561,616	9,122,549	108,573,998
Walker County	$ 3,352,856	$ 3,555,014	$ 3,766,283	$ 3,987,029	$ 4,217,630	$ 4,458,479	$ 4,709,983	68,262,513
Subtotal	**$ 14,526,096**	**$ 15,479,083**	**$ 16,476,176**	**$ 17,519,163**	**$ 18,609,901**	**$ 19,750,316**	**$ 20,942,407**	**$ 279,881,024**
Acreage for Mitigation								
Grimes County	$ 14,885,265	$ 15,331,823	$ 15,791,778	$ 16,265,531	$ 16,753,497	$ 17,256,102	$ 17,773,785	$ 441,456,101
Madison County	25,465,345	26,229,305	27,016,184	27,826,670	28,661,470	29,521,314	30,406,954	655,929,852
Walker County	9,860,842	10,156,667	10,461,367	10,775,208	11,098,464	11,431,418	11,774,361	292,445,492
Subtotal	**$ 50,211,452**	**$ 51,717,795**	**$ 53,269,329**	**$ 54,867,409**	**$ 56,513,431**	**$ 58,208,834**	**$ 59,955,099**	**$ 1,389,831,444**
Total Impacts	**$ 119,871,985**	**$ 124,300,893**	**$ 128,887,650**	**$ 133,637,742**	**$ 138,556,841**	**$ 143,650,812**	**$ 148,925,720**	**$ 3,184,939,814**

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	$-Value per year	(Applicable for income only) disposable	locally spent	Multiplier effect (ME)	$-Value per year w/ ME	Year of Value	First Year of Impact	Last Year of Impact
Basin of Origin Benefits								
Construction: Local Payroll & Materials								
Grimes County	$ 200,384	90.0%	42.2%	1.16	$ 87,864	2002	2010	2014
Madison County	110,095	88.4%	45.0%	1.16	50,966	2002	2010	2014
Walker County	525,446	86.0%	51.5%	1.21	281,362	2002	2010	2014
Subtotal	**$ 835,926**				**$ 420,193**			
Commerce from Lake Visitors								
Grimes County	$ 6,450,148			1.16	$ 7,456,450	1999	2025	2054
Madison County	10,965,252			1.16	12,756,310	1999	2025	2054
Walker County	4,085,094			1.21	4,939,574	1999	2025	2054
Subtotal	**$ 21,500,494**				**$ 25,152,334**			
Commerce from New Residents								
Grimes County	$ 199,846,373	90.0%	42.2%	1.16	$ 87,628,537	2005	2025	2054
Madison County	387,119,278	88.4%	45.0%	1.16	179,209,049	2005	2025	2054
Walker County	120,661,305	86.0%	51.5%	1.21	64,610,774	2005	2025	2054
Subtotal	**$ 707,626,956**				**$ 331,448,360**			
Total Benefits								

	Income	disposable	locally spent	Multiplier effect (ME)	Income per year w/ ME	Year of Value	First Year of Impact	Last Year of Impact
Basin of Destination Benefits (Montgomery County)								
Construction: Local Payroll & Materials								
Montgomery County	$5,831,984	83.5%	56.8%	1.36	$3,770,584	2002	2010	2014
Per Capita Income (disposable, locally spent)	$32,068	83.5%	56.8%	1.36	$20,733	2005		
Assumed Increase in Population								
Commerce from New Residents (Montgomery County)						2005	2025	2054
Total Benefits								

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	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Basin of Origin Benefits														
Construction: Local Payroll & Materials														
Grimes County	$ 22,261	$ 22,929	$ 23,616	$ 24,325	$ 25,055	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Madison County	12,913	13,300	13,699	14,110	14,533	-	-	-	-	-	-	-	-	-
Walker County	71,284	73,423	75,625	77,894	80,231	-	-	-	-	-	-	-	-	-
Subtotal	**$ 106,457**	**$ 109,651**	**$ 112,941**	**$ 116,329**	**$ 119,819**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Commerce from Lake Visitors														
Grimes County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Madison County	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walker County	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Commerce from New Residents														
Grimes County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Madison County	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walker County	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Total Benefits	**$ 106,457**	**$ 109,651**	**$ 112,941**	**$ 116,329**	**$ 119,819**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Basin of Destination Benefits (Montgomery County)														
Construction: Local Payroll & Materials														
Montgomery County	$ 955,293	$ 983,951	$ 1,013,470	$ 1,043,874	$ 1,075,190	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Per Capita Income (disposable, locally spent)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Assumed Increase in Population	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commerce from New Residents (Montgomery County)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Benefits	**$ 955,293**	**$ 983,951**	**$ 1,013,470**	**$ 1,043,874**	**$ 1,075,190**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

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	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Basin of Origin Benefits												
Construction: Local Payroll & Materials												
Grimes County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Madison County	-	-	-	-	-	-	-	-	-	-	-	-
Walker County	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Commerce from Lake Visitors												
Grimes County	$ -	$ 804,026	$ 1,656,293	$ 2,558,973	$ 3,514,322	$ 4,524,690	$ 5,592,517	$ 6,720,341	$ 7,910,802	$ 9,166,641	$ 10,490,712	$ 11,885,976
Madison County	-	1,375,507	2,833,545	4,377,827	6,012,216	7,740,728	9,567,540	11,496,994	13,533,604	15,682,064	17,947,251	20,334,235
Walker County	-	532,632	1,097,222	1,695,208	2,328,086	2,997,411	3,704,800	4,451,934	5,240,562	6,072,502	6,949,641	7,873,943
Subtotal	**$ -**	**$ 2,712,165**	**$ 5,587,060**	**$ 8,632,008**	**$ 11,854,624**	**$ 15,262,829**	**$ 18,864,856**	**$ 22,669,269**	**$ 26,684,968**	**$ 30,921,207**	**$ 35,387,604**	**$ 40,094,155**
Commerce from New Residents												
Grimes County	$ -	$ 3,165,338	$ 6,520,596	$ 10,074,320	$ 13,835,400	$ 17,813,077	$ 22,016,964	$ 26,457,051	$ 31,143,729	$ 36,087,796	$ 41,300,478	$ 46,793,441
Madison County	-	6,473,430	13,335,265	20,602,984	28,294,765	36,429,510	45,026,874	54,107,294	63,692,014	73,803,122	84,463,572	95,697,228
Walker County	-	2,333,885	4,807,803	7,428,055	10,201,196	13,134,040	16,233,674	19,507,464	22,963,072	26,608,460	30,451,904	34,502,008
Subtotal	**$ -**	**$ 11,972,652**	**$ 24,663,663**	**$ 38,105,360**	**$ 52,331,361**	**$ 67,376,627**	**$ 83,277,511**	**$ 100,071,809**	**$ 117,798,816**	**$ 136,499,378**	**$ 156,215,954**	**$ 176,992,676**
Total Benefits	**$ -**	**$ 14,684,817**	**$ 30,250,724**	**$ 46,737,368**	**$ 64,185,985**	**$ 82,639,456**	**$ 102,142,368**	**$ 122,741,079**	**$ 144,483,784**	**$ 167,420,585**	**$ 191,603,558**	**$ 217,086,831**
Basin of Destination Benefits (Montgomery County)												
Construction: Local Payroll & Materials												
Montgomery County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Per Capita Income (disposable, locally spent)	$ -	$ 37,446	$ 38,569	$ 39,726	$ 40,918	$ 42,146	$ 43,410	$ 44,712	$ 46,054	$ 47,435	$ 48,858	$ 50,324
Assumed Increase in Population	-	11,421	23,456	36,139	49,504	63,587	78,960	90,927	103,371	116,308	129,760	143,747
Commerce from New Residents (Montgomery County)	**-**	**427,666,001**	**904,686,242**	**1,435,660,657**	**2,025,593,580**	**2,679,928,623**	**3,427,647,614**	**4,065,579,368**	**4,760,604,272**	**5,517,127,309**	**6,339,876,572**	**7,233,926,500**
Total Benefits	**$ -**	**$ 427,666,001**	**$ 904,686,242**	**$ 1,435,660,657**	**$ 2,025,593,580**	**$ 2,679,928,623**	**$ 3,427,647,614**	**$ 4,065,579,368**	**$ 4,760,604,272**	**$ 5,517,127,309**	**$ 6,339,876,572**	**$ 7,233,926,500**

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	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Basin of Origin Benefits												
Construction: Local Payroll & Materials												
Grimes County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Madison County	-	-	-	-	-	-	-	-	-	-	-	-
Walker County	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Commerce from Lake Visitors												
Grimes County	$ 13,355,515	$ 14,902,529	$ 16,530,344	$ 18,242,415	$ 20,042,333	$ 21,933,829	$ 23,920,775	$ 26,007,199	$ 28,197,279	$ 29,043,197	$ 29,914,493	$ 30,811,928
Madison County	22,848,286	25,494,880	28,279,705	31,208,674	34,287,930	37,523,853	40,923,073	44,492,475	48,239,209	49,686,386	51,176,977	52,712,286
Walker County	8,847,449	9,872,278	10,950,635	12,084,808	13,277,175	14,530,209	15,846,475	17,228,639	18,679,472	19,239,856	19,817,052	20,411,564
Subtotal	**$ 45,051,250**	**$ 50,269,687**	**$ 55,760,683**	**$ 61,535,897**	**$ 67,607,439**	**$ 73,987,891**	**$ 80,690,323**	**$ 87,728,313**	**$ 95,115,960**	**$ 97,969,439**	**$ 100,908,522**	**$ 103,935,778**
Commerce from New Residents												
Grimes County	$ 52,578,812	$ 58,669,191	$ 65,077,672	$ 71,817,859	$ 78,903,888	$ 86,350,443	$ 94,172,777	$ 102,386,736	$ 111,008,777	$ 120,055,992	$ 129,546,132	$ 139,497,631
Madison County	107,528,885	119,984,314	133,090,293	146,874,645	161,366,276	176,595,219	192,592,668	209,391,028	227,023,957	245,526,410	264,934,688	285,286,489
Walker County	38,767,710	43,258,303	47,983,441	52,953,155	58,177,866	63,668,402	69,436,010	75,492,373	81,849,626	88,520,371	95,517,695	102,855,191
Subtotal	**$ 198,875,407**	**$ 221,911,809**	**$ 246,151,406**	**$ 271,645,659**	**$ 298,448,031**	**$ 326,614,063**	**$ 356,201,455**	**$ 387,270,138**	**$ 419,882,360**	**$ 454,102,772**	**$ 489,998,515**	**$ 527,639,310**
Total Benefits	**$ 243,926,658**	**$ 272,181,495**	**$ 301,912,089**	**$ 333,181,556**	**$ 366,055,469**	**$ 400,601,954**	**$ 436,891,778**	**$ 474,998,450**	**$ 514,998,320**	**$ 552,072,211**	**$ 590,907,037**	**$ 631,575,088**
Basin of Destination Benefits (Montgomery County)												
Construction: Local Payroll & Materials												
Montgomery County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Per Capita Income (disposable, locally spent)	$ 51,834	$ 53,389	$ 54,991	$ 56,640	$ 58,339	$ 60,090	$ 61,892	$ 63,749	$ 65,662	$ 67,631	$ 69,660	$ 71,750
Assumed Increase in Population	158,289	173,409	189,130	205,476	222,995	239,755	257,127	275,134	293,799	313,147	333,202	353,990
Commerce from New Residents (Montgomery County)	**8,204,722,776**	**9,258,108,995**	**10,400,355,242**	**11,638,188,700**	**13,009,435,305**	**14,406,773,206**	**15,914,165,701**	**17,539,524,211**	**19,291,309,383**	**21,178,568,671**	**23,210,976,468**	**25,398,876,965**
Total Benefits	**$ 8,204,722,776**	**$ 9,258,108,995**	**$ 10,400,355,242**	**$ 11,638,188,700**	**$ 13,009,435,305**	**$ 14,406,773,206**	**$ 15,914,165,701**	**$ 17,539,524,211**	**$ 19,291,309,383**	**$ 21,178,568,671**	**$ 23,210,976,468**	**$ 25,398,876,965**

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	2048	2049	2050	2051	2052	2053	2054	Total
Basin of Origin Benefits								
Construction: Local Payroll & Materials								
Grimes County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 118,185
Madison County	-	-	-	-	-	-	-	68,555
Walker County	-	-	-	-	-	-	-	378,457
Subtotal	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 565,197**
Commerce from Lake Visitors								
Grimes County	$ 31,736,285	$ 32,688,374	$ 33,669,025	$ 34,679,096	$ 35,719,469	$ 36,791,053	$ 37,894,785	$ 580,905,215
Madison County	54,293,655	55,922,465	57,600,139	59,328,143	61,107,987	62,941,227	64,829,463	993,798,325
Walker County	21,023,911	21,654,628	22,304,267	22,973,395	23,662,597	24,372,475	25,103,649	384,824,473
Subtotal	**$ 107,053,851**	**$ 110,265,467**	**$ 113,573,431**	**$ 116,980,633**	**$ 120,490,052**	**$ 124,104,754**	**$ 127,827,897**	**$ 1,959,528,013**
Commerce from New Residents								
Grimes County	$ 149,929,627	$ 160,861,996	$ 172,315,370	$ 184,311,171	$ 196,871,636	$ 210,019,849	$ 223,779,770	$ 2,663,363,517
Madison County	306,620,956	328,978,735	352,402,020	376,934,623	402,622,019	429,511,418	457,651,821	5,446,842,520
Walker County	110,546,970	118,607,687	127,052,554	135,897,366	145,158,520	154,853,036	164,998,580	1,963,766,419
Subtotal	**$ 567,097,554**	**$ 608,448,417**	**$ 651,769,945**	**$ 697,143,160**	**$ 744,652,175**	**$ 794,384,303**	**$ 846,430,171**	**$ 10,073,972,456**
Total Benefits	**$ 674,151,405**	**$ 718,713,884**	**$ 765,343,375**	**$ 814,123,793**	**$ 865,142,228**	**$ 918,489,057**	**$ 974,258,067**	**$ 12,034,065,666**
Basin of Destination Benefits (Montgomery County)								
Construction: Local Payroll & Materials								
Montgomery County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 5,071,778**
Per Capita Income (disposable, locally spent)	$ 73,903	$ 76,120	$ 78,403	$ 80,755	$ 83,178	$ 85,673	$ 88,244	
Assumed Increase in Population	375,539	397,875	421,546	442,235	463,562	485,547	508,209	
Commerce from New Residents (Montgomery County)	**27,753,329,927**	**30,286,159,581**	**33,050,608,553**	**35,712,893,718**	**38,558,222,368**	**41,598,457,174**	**44,846,210,136**	**480,075,183,819**
Total Benefits	**$ 27,753,329,927**	**$ 30,286,159,581**	**$ 33,050,608,553**	**$ 35,712,893,718**	**$ 38,558,222,368**	**$ 41,598,457,174**	**$ 44,846,210,136**	**$ 480,080,255,597**

PRESENT VALUE CALCULATION

Basin of Origin Impacts
Loss of Commerce from Farm Production:
Acreage within Lake
Acreage for Lake Development
Acreage for Mitigation
Loss of Government Income for Agricultural Subsidies:
Acreage within Lake
Acreage for Lake Development
Acreage for Mitigation
Loss of Commerce from Forestry
Acreage within Lake
Acreage for Lake Development
Acreage for Mitigation
Total Impacts (discounted)

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Basin of Origin Benefits
Construction: Local Payroll & Materials
Commerce from Lake Visitors
Commerce from New Residents
Total Benefits (discounted)

Basin of Destination Benefits (Montgomery County)
Construction: Local Payroll & Materials
Commerce from New Residents (Montgomery County)
Total Benefits Montgomery County (discounted)

Total Net Present Value

PRESENT VALUE CALCULATION

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Basin of Origin Impacts														
Loss of Commerce from Farm Production:														
Acreage within Lake	$ 450,681	$ 884,192	$ 1,301,026	$ 1,701,660	$ 1,669,247	$ 1,637,452	$ 1,606,262	$ 1,575,667	$ 1,545,654	$ 1,516,213	$ 1,487,333	$ 1,459,003	$ 1,431,212	$ 1,403,951
Acreage for Lake Development	-	-	-	-	-	70,507	138,328	203,539	266,216	326,432	384,257	439,761	493,010	544,072
Acreage for Mitigation	1,643,276	3,223,951	4,743,813	6,204,606	6,086,423	5,970,492	5,856,768	5,745,210	5,635,778	5,528,430	5,423,126	5,319,829	5,218,499	5,119,099
Loss of Government Income for Agricultural Subsidies:														
Acreage within Lake	2,571	5,045	7,423	9,709	9,524	9,342	9,164	8,990	8,819	8,651	8,486	8,324	8,166	8,010
Acreage for Lake Development	-	-	-	-	-	402	789	1,161	1,519	1,862	2,192	2,509	2,813	3,104
Acreage for Mitigation	9,376	18,394	27,065	35,400	34,725	34,064	33,415	32,779	32,154	31,542	30,941	30,352	29,774	29,206
Loss of Commerce from Forestry														
Acreage within Lake	366,139	718,329	1,056,970	1,382,450	1,356,118	1,330,287	1,304,948	1,280,092	1,255,709	1,231,791	1,519,190	1,795,194	2,060,133	2,314,327
Acreage for Lake Development	-	-	-	-	-	57,281	112,379	165,358	216,277	265,197	312,175	357,267	400,528	442,011
Acreage for Mitigation	1,576,471	3,092,885	4,550,959	5,952,366	5,838,988	5,727,769	5,618,668	5,511,646	5,406,662	5,303,678	6,541,123	7,729,503	8,870,238	9,964,713
Total Impacts (discounted)	**$ 4,048,513**	**$ 7,942,796**	**$ 11,687,257**	**$ 15,286,190**	**$ 14,995,025**	**$ 14,837,595**	**$ 14,680,722**	**$ 14,524,442**	**$ 14,368,789**	**$ 14,213,796**	**$ 15,708,824**	**$ 17,141,741**	**$ 18,514,372**	**$ 19,828,493**
Basin of Origin Benefits														
Construction: Local Payroll & Materials	$ 83,412	$ 81,823	$ 80,265	$ 78,736	$ 77,236	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from Lake Visitors	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commerce from New Residents	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Benefits (discounted)	**$ 83,412**	**$ 81,823**	**$ 80,265**	**$ 78,736**	**$ 77,236**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Basin of Destination Benefits (Montgomery County)														
Construction: Local Payroll & Materials	$ 748,497	$ 734,240	$ 720,254	$ 706,535	$ 693,077	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents (Montgomery County)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Benefits Montgomery County (discounted)	**$ 748,497**	**$ 734,240**	**$ 720,254**	**$ 706,535**	**$ 693,077**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Total Net Present Value	**$ (3,216,604)**	**$ (7,126,733)**	**$ (10,886,738)**	**$ (14,500,919)**	**$ (14,224,711)**	**$ (14,837,595)**	**$ (14,680,722)**	**$ (14,524,442)**	**$ (14,368,789)**	**$ (14,213,796)**	**$ (15,708,824)**	**$ (17,141,741)**	**$ (18,514,372)**	**$ (19,828,493)**

PRESENT VALUE CALCULATION

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Basin of Origin Impacts												
Loss of Commerce from Farm Production:												
Acreage within Lake	$ 1,377,209	$ 1,350,976	$ 1,325,244	$ 1,300,001	$ 1,275,239	$ 1,250,949	$ 1,227,121	$ 1,203,747	$ 1,180,819	$ 1,158,327	$ 1,136,264	$ 1,114,621
Acreage for Lake Development	593,010	639,886	684,761	727,695	768,744	807,966	845,414	881,143	915,204	947,648	978,523	1,007,879
Acreage for Mitigation	5,021,592	4,925,943	4,832,115	4,740,075	4,649,788	4,561,220	4,474,340	4,389,114	4,305,512	4,223,502	4,143,055	4,064,139
Loss of Government Income for Agricultural Subsidies:												
Acreage within Lake	7,857	7,708	7,561	7,417	7,276	7,137	7,001	6,868	6,737	6,609	6,483	6,359
Acreage for Lake Development	3,383	3,651	3,907	4,152	4,386	4,610	4,823	5,027	5,222	5,407	5,583	5,750
Acreage for Mitigation	28,650	28,104	27,569	27,044	26,529	26,023	25,528	25,042	24,565	24,097	23,638	23,187
Loss of Commerce from Forestry												
Acreage within Lake	2,270,244	2,227,002	2,184,582	2,142,971	2,102,153	2,062,112	2,022,834	1,984,303	1,946,507	1,909,431	1,873,061	1,837,383
Acreage for Lake Development	481,769	568,485	651,722	731,582	808,163	881,562	951,871	1,019,182	1,083,583	1,145,161	1,204,000	1,260,183
Acreage for Mitigation	9,774,909	9,588,720	9,406,078	9,226,914	9,051,163	8,878,760	8,709,641	8,543,743	8,381,005	8,221,367	8,064,770	7,911,155
Total Impacts (discounted)	**$ 19,558,624**	**$ 19,340,474**	**$ 19,123,538**	**$ 18,907,850**	**$ 18,693,440**	**$ 18,480,339**	**$ 18,268,573**	**$ 18,058,170**	**$ 17,849,154**	**$ 17,641,548**	**$ 17,435,376**	**$ 17,230,657**
Basin of Origin Benefits												
Construction: Local Payroll & Materials	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from Lake Visitors	-	1,022,187	2,005,433	2,950,851	3,859,526	4,732,513	5,570,844	6,375,522	7,147,524	7,887,803	8,597,288	9,276,883
Commerce from New Residents	-	3,490,180	6,847,401	10,075,462	13,178,064	16,158,817	19,021,236	21,768,747	24,404,691	26,932,320	29,354,803	31,675,231
Total Benefits (discounted)	**$ -**	**#REF!**	**#REF!**	**#REF!**	**$ 17,037,590**	**$ 20,891,330**	**$ 24,592,080**	**$ 28,144,269**	**$ 31,552,215**	**$ 34,820,123**	**$ 37,952,091**	**$ 40,952,114**
Basin of Destination Benefits (Montgomery County)												
Construction: Local Payroll & Materials	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents (Montgomery County)	-	161,182,818	324,730,219	490,780,411	659,475,147	830,959,868	1,012,193,841	1,143,406,529	1,275,119,852	1,407,384,072	1,540,249,689	1,673,767,457
Total Benefits Montgomery County (discounted)	**$ -**	**$ 161,182,818**	**$ 324,730,219**	**$ 490,780,411**	**$ 659,475,147**	**$ 830,959,868**	**$ 1,012,193,841**	**$ 1,143,406,529**	**$ 1,275,119,852**	**$ 1,407,384,072**	**$ 1,540,249,689**	**$ 1,673,767,457**
Total Net Present Value	**$ (19,558,624)**	**#REF!**	**#REF!**	**#REF!**	**$ 657,819,296**	**$ 833,370,859**	**$ 1,018,517,348**	**$ 1,153,492,629**	**$ 1,288,822,913**	**$ 1,424,562,646**	**$ 1,560,766,405**	**$ 1,697,488,914**

PRESENT VALUE CALCULATION

	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Basin of Origin Impacts												
Loss of Commerce from Farm Production:												
Acreage within Lake	$ 1,093,390	$ 1,072,563	$ 1,052,133	$ 1,032,093	$ 1,012,434	$ 993,149	$ 974,232	$ 955,675	$ 937,472	$ 919,616	$ 902,099	$ 884,916
Acreage for Lake Development	1,035,762	1,062,216	1,087,287	1,111,018	1,133,449	1,154,624	1,174,580	1,193,358	1,210,993	1,227,524	1,242,986	1,257,414
Acreage for Mitigation	3,986,727	3,910,790	3,836,298	3,763,226	3,691,546	3,621,230	3,552,255	3,484,593	3,418,219	3,353,110	3,289,242	3,226,589
Loss of Government Income for Agricultural Subsidies:												
Acreage within Lake	6,238	6,119	6,003	5,888	5,776	5,666	5,558	5,452	5,349	5,247	5,147	5,049
Acreage for Lake Development	5,909	6,060	6,203	6,339	6,467	6,588	6,701	6,809	6,909	7,003	7,092	7,174
Acreage for Mitigation	22,746	22,313	21,888	21,471	21,062	20,660	20,267	19,881	19,502	19,131	18,766	18,409
Loss of Commerce from Forestry												
Acreage within Lake	1,802,386	1,768,054	1,734,377	1,701,341	1,668,935	1,637,146	1,605,962	1,575,372	1,545,365	1,515,930	1,487,055	1,458,730
Acreage for Lake Development	1,313,788	1,364,894	1,413,576	1,459,908	1,503,963	1,545,810	1,585,516	1,623,150	1,658,774	1,692,453	1,724,246	1,754,215
Acreage for Mitigation	7,760,466	7,612,648	7,467,645	7,325,404	7,185,873	7,048,999	6,914,732	6,783,023	6,653,823	6,527,083	6,402,758	6,280,800
Total Impacts (discounted)	**$ 17,027,411**	**$ 16,825,657**	**$ 16,625,411**	**$ 16,426,688**	**$ 16,229,504**	**$ 16,033,872**	**$ 15,839,804**	**$ 15,647,313**	**$ 15,456,407**	**$ 15,267,097**	**$ 15,079,391**	**$ 14,893,296**
Basin of Origin Benefits												
Construction: Local Payroll & Materials	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from Lake Visitors	9,927,470	10,549,906	11,145,029	11,713,653	12,256,572	12,774,558	13,268,364	13,738,724	14,186,352	13,916,136	13,651,067	13,391,046
Commerce from New Residents	33,896,610	36,021,874	38,053,877	39,995,402	41,849,157	43,617,782	45,303,847	46,909,857	48,438,248	50,587,202	52,636,718	54,589,803
Total Benefits (discounted)	**$ 43,824,080**	**$ 46,571,781**	**$ 49,198,907**	**$ 51,709,055**	**$ 54,105,729**	**$ 56,392,340**	**$ 58,572,212**	**$ 60,648,581**	**$ 62,624,600**	**$ 64,503,338**	**$ 66,287,784**	**$ 67,980,849**
Basin of Destination Benefits (Montgomery County)												
Construction: Local Payroll & Materials	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents (Montgomery County)	1,807,988,403	1,942,963,845	2,078,745,415	2,215,385,078	2,358,484,239	2,487,436,215	2,616,855,910	2,746,783,586	2,877,259,564	3,008,324,237	3,140,018,085	3,272,381,685
Total Benefits Montgomery County (discounted)	**$ 1,807,988,403**	**$ 1,942,963,845**	**$ 2,078,745,415**	**$ 2,215,385,078**	**$ 2,358,484,239**	**$ 2,487,436,215**	**$ 2,616,855,910**	**$ 2,746,783,586**	**$ 2,877,259,564**	**$ 3,008,324,237**	**$ 3,140,018,085**	**$ 3,272,381,685**
Total Net Present Value	**$ 1,834,785,072**	**$ 1,972,709,968**	**$ 2,111,318,911**	**$ 2,250,667,445**	**$ 2,396,360,463**	**$ 2,527,794,683**	**$ 2,659,588,318**	**$ 2,791,784,855**	**$ 2,924,427,757**	**$ 3,057,560,478**	**$ 3,191,226,479**	**$ 3,325,469,238**

PRESENT VALUE CALCULATION

	2048	2049	2050	2051	2052	2053	2054	Total
Basin of Origin Impacts								
Loss of Commerce from Farm Production:								
Acreage within Lake	$ 868,061	$ 851,526	$ 835,307	$ 819,396	$ 803,788	$ 788,478	$ 773,460	$ 52,139,856
Acreage for Lake Development	1,270,841	1,283,300	1,294,824	1,305,442	1,315,187	1,324,087	1,332,170	35,681,057
Acreage for Mitigation	3,165,131	3,104,842	3,045,703	2,987,689	2,930,781	2,874,956	2,820,195	190,112,815
Loss of Government Income for Agricultural Subsidies:								
Acreage within Lake	4,953	4,858	4,766	4,675	4,586	4,499	4,413	297,478
Acreage for Lake Development	7,251	7,322	7,387	7,448	7,504	7,554	7,601	203,574
Acreage for Mitigation	18,058	17,714	17,377	17,046	16,721	16,403	16,090	1,084,665
Loss of Commerce from Forestry								
Acreage within Lake	1,430,945	1,403,688	1,376,952	1,350,724	1,324,996	1,299,758	1,275,000	**$ 72,496,976**
Acreage for Lake Development	1,782,416	1,808,906	1,833,741	1,856,973	1,878,655	1,898,837	1,917,569	**$ 44,733,126**
Acreage for Mitigation	6,161,166	6,043,811	5,928,690	5,815,763	5,704,987	5,596,320	5,489,724	**$ 312,147,609**
Total Impacts (discounted)	**$ 14,708,820**	**$ 14,525,968**	**$ 14,344,746**	**$ 14,165,156**	**$ 13,987,204**	**$ 13,810,892**	**$ 13,636,222**	**$ 708,897,156**
Basin of Origin Benefits								
Construction: Local Payroll & Materials	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 401,473
Commerce from Lake Visitors	13,135,979	12,885,770	12,640,326	12,399,558	12,163,376	11,931,693	11,704,422	296,806,376
Commerce from New Residents	56,449,387	58,218,324	59,899,393	61,495,299	63,008,676	64,442,089	65,798,036	1,164,118,532
Total Benefits (discounted)	**$ 69,585,366**	**$ 71,104,094**	**$ 72,539,719**	**$ 73,894,857**	**$ 75,172,052**	**$ 76,373,782**	**$ 77,502,459**	**$ 1,461,326,381**
Basin of Destination Benefits (Montgomery County)								
Construction: Local Payroll & Materials	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,602,603
Commerce from New Residents (Montgomery County)	3,405,455,727	3,539,281,021	3,678,417,350	3,785,447,994	3,892,422,258	3,999,363,403	4,106,294,498	67,478,558,415
Total Benefits Montgomery County (discounted)	**$ 3,405,455,727**	**$ 3,539,281,021**	**$ 3,678,417,350**	**$ 3,785,447,994**	**$ 3,892,422,258**	**$ 3,999,363,403**	**$ 4,106,294,498**	**$ 67,482,161,018**
Total Net Present Value	**$ 3,460,332,272**	**$ 3,595,859,147**	**$ 3,736,612,323**	**$ 3,845,177,695**	**$ 3,953,607,106**	**$ 4,061,926,293**	**$ 4,170,160,735**	**$ 68,234,590,243**

Table 1
Loss of Commerce from Farm Production

			Madison	Grimes	Walker
Acres of Farmable Land in the Lake Site	9,005	(1)	4,592	2,701	1,711
Acres of Farm Land Removed from Production by Lakeside Development	19,387	(2)	9,887	5,816	3,683
Acres of Farm Land Required for Mitigation	32,833	(3)	16,745	9,850	6,238
Total Acres of Land Removed from Agricultural Use	61,224	(4)	31,224	18,367	11,633
Annual Agr. Related Commerce/Acre, 3 counties	$ 94,057	(5)	$ 270.46	$ 83.91	$ 134.25
Annual Agr. Related Commerce Lost (within the lakesite)	$1,698,394	(6)	$1,242,040	$226,665	$229,689
Annual Agr. Related Commerce Lost (lakeside development)	$3,656,542	(7)	$2,674,039	$487,996	$494,506
Annual Agr. Related Commerce Lost (mitigation)	$6,192,698	(8)	$4,528,738	$826,467	$837,493
Total Annual Agr. Commerce Lost	$11,547,634	(9)	$8,444,817	$1,541,128	$1,561,689

Notes:
(1) Estimated Number of Farmable Acres within Proposed Take-line
(2) Estimated Farm Land Adjacent to Proposed Take-line Available for Residential Development
(3) Mitigation acreage estimated to be moderate: Texas Department Wildlife, 1990
(4) Estimated Number of Acres Removed from Agricultural Use
(5) Estimated Market Value of Agricultural Products per Acre, US Department of Agriculture Census 2002, escalated to 2005
(6) Estimated Market Value of Agricultural Commerce Lost (within lakesite)
(7) Estimated Market Value of Agricultural Commerce Lost (lakesite development)
(8) Estimated Market Value of Agricultural Commerce Lost (mitigation)
(9) Estimated Total Market Value of Agricultural Products Lost, US Department of Agriculture Census 2002, escalated to 2005

Table 2
Loss of Income from Agricultural Subsidies

			Madison	Grimes	Walker
Acres of farmable land in the lake site	9,005	(1)	4,592	2,701	1,711
Acres of land removed from production by lakeside development	19,387	(2)	9,887	5,816	3,683
Acres of Land Required for Mitigation	32,833	(3)	16,745	9,850	6,238
Total acres of land removed from Agr. use.	61,224	(4)	31,224	18,367	11,633
Subsidies per acre		(5)	$ 1.20	$ 1.13	$ 0.67
Annual Loss from Agricultural Subsidy (within lakesite)	$9,708	(6)	$ 5,523	$ 3,046	$ 1,139
Annual Loss from Agricultural Subsidy (lakeside development)	$20,900	(7)	$ 11,890	$ 6,558	$ 2,451
Annual Loss from Agricultural Subsidy (mitigation)	$35,397	(8)	$ 20,138	$ 11,107	$ 4,152
Total Annual Loss in Income from Government Agricultural Subsidy	$66,005	(9)	$ 37,551	$ 20,712	$ 7,742

Notes:
(1) Estimated Number of Farmable Acres within Proposed Take-line
(2) Area Adjacent to Proposed Take-line Available for Residential Development
(3) Mitigation acreage estimated to be moderate: Texas Department Wildlife, 1990
(4) Estimated Number of Acres Removed from Agricultural Use
(5) Estimated Subsidy/acre, EWG.org, 10 year average in 2005 $
(6) Estimated Annual Loss from Agricultural Subsidy (within lakesite)
(7) Estimated Annual Loss from Agricultural Subsidy (lakeside development)
(8) Estimated Annual Loss from Agricultural Subsidy (mitigation)
(9) Estimated Total Annual Value of Government Income Lost

Table 3
Loss of Commerce from Forestry

			Madison	Grimes	Walker
Acres of Forests in the Lake Site	18,395	(1)	9,382	5,519	3,495
Acres of Forests Removed from Production by Lakeside Development	39,604	(2)	20,198	11,881	7,525
Acres of Forests Required for Mitigation	79,204	(3)	40,394	23,761	15,049
Total Acres of Land Removed from Forestry Use	137,203	(4)	69,974	41,161	26,069
Annual Forestry Related Commerce/Acre, 3 counties		(5)	$ 152.03	$ 152.03	$ 152.03
Forestry Commerce Lost in the Lake Site	$2,796,612		1,426,272	838,983	531,356
Forestry Commerce Lost from Production by Lakeside Development	$6,020,940		3,070,679	1,806,282	1,143,979
Forestry Commerce Lost for Mitigation	$12,041,269		6,141,047	3,612,381	2,287,841
Annual Forestry Related Commerce Lost	$20,858,821	(6)	$10,637,999	$6,257,646	$3,963,176

Notes:
(1) Estimated Number of Forest Acres within Proposed Take-line
(2) Estimated Forest Adjacent to Proposed Take-line Available for Residential Development
(3) Mitigation acreage estimated to be moderate: Texas Department Wildlife, 1990
(4) Estimated Number of Acres Removed from Forestry Use
(5) Estimated Market Value of Forestry Products per Acre, Walker County Extension
(6) Estimated Market Value of Forestry Commerce Lost

Table 4
Short Term Benefits From Construction

	Percent of Total	Value	
Projected Lake Construction Cost		$215,119,804	(1)
Direct Construction Employment (Local Payroll)	15%	$32,267,971	(2)
Commerce from Construction	20%	$43,023,961	(3)
Total Short Term Benefits from Construction		$75,291,931	
Madison	0.3%	$110,095	(4)
Grimes	0.6%	$200,384	
Walker	1.6%	$525,446	

Notes:
(1) Estimated Project Cost Region H 2006, 2002 Dollars
(2) Estimated Construction Based Local Payroll, RSMeans Manuals
(3) Estimated Construction Based Materials, RS Means Manuals
(4) Benefits distributed by county population 2000 Census

Table 5
Commerce from Lake Visitors

		Madison	Grimes	Walker
Estimated visitors per year	1,565,950 (1)	798,635	469,785	297,531
Estimated spending/visitor per visit	$14.59 (2)	$14.59	$14.59	$14.59
Estimated spending/visitor per visit less State Sales Tax	$13.73 (3)	$13.73	$13.73	$13.73
Annual visitor commerce	$21,500,494 (4)	$10,965,252	$6,450,148	$4,085,094
Estimated non-local visitors	97% (5)	97%	97%	97%
Estimated non-local visitor annual commerce	$20,752,073 (6)	$10,583,557	$6,225,622	$3,942,894
Estimated local visitor annual commerce	$748,421 (7)			

Notes:
(1) Average Estimated Number of Visitors for Selected Lakes, USACE 1999 Summary (Addicks, Somerville)
(2) Estimated Spending/Visitor per visit, Average for Selected Lakes, USACE 1999 Summary (Addicks, Somerville)
(3) Estimated Spending/Visitor per visit Less 6.25% Texas State Sales Tax
(4) Estimated Total Annual Visitor Commerce
(5) Estimated % of out-of-town Lake Visitors for Somerville State Park, Texas A&M Recreation, Park & Tourism Sciences (Adjusted)
(6) Estimated Non-Local Visitor Annual Commerce, 1999 Dollars
(7) Estimated Local Visitor Annual Commerce

Table 6
Commerce from New Residents

			Madison	Grimes	Walker
Estimated population increase	35,600	(1)	18,156	10,680	6,764
Estimated annual per capita income		(2)	$ 21,322	$ 18,712	$ 17,839
Estimated residential commerce	$ 707,626,956	(3)	$ 387,119,278	$ 199,846,373	$ 120,661,305

Notes:
(1) Estimated Increase in Population Due to Adjacent Residential Development
(2) IMPLAN Professional Software, Analysis 2003
(3) Estimated Increase in New Resident Commerce

Table 7
Short Term Benefits From Construction

	Percent of Total	Value	
Projected Lake Construction Cost		$215,119,804	(1)
Direct Construction Employment (Local Payroll)	15%	$32,267,971	(2)
Local Purchase of Construction Materials	20%	$43,023,961	(3)
Total Short Term Benefits from Construction		$75,291,931	
Montgomery	7.7%	$5,831,984	(4)

Notes:
(1) Estimated Project Cost Region H 2006, 2002 Dollars
(2) Estimated Construction Based Local Payroll, RSMeans Manuals
(3) Estimated Construction Based Materials, RS Means Manuals
(4) Benefits distributed by county population 2000 Census

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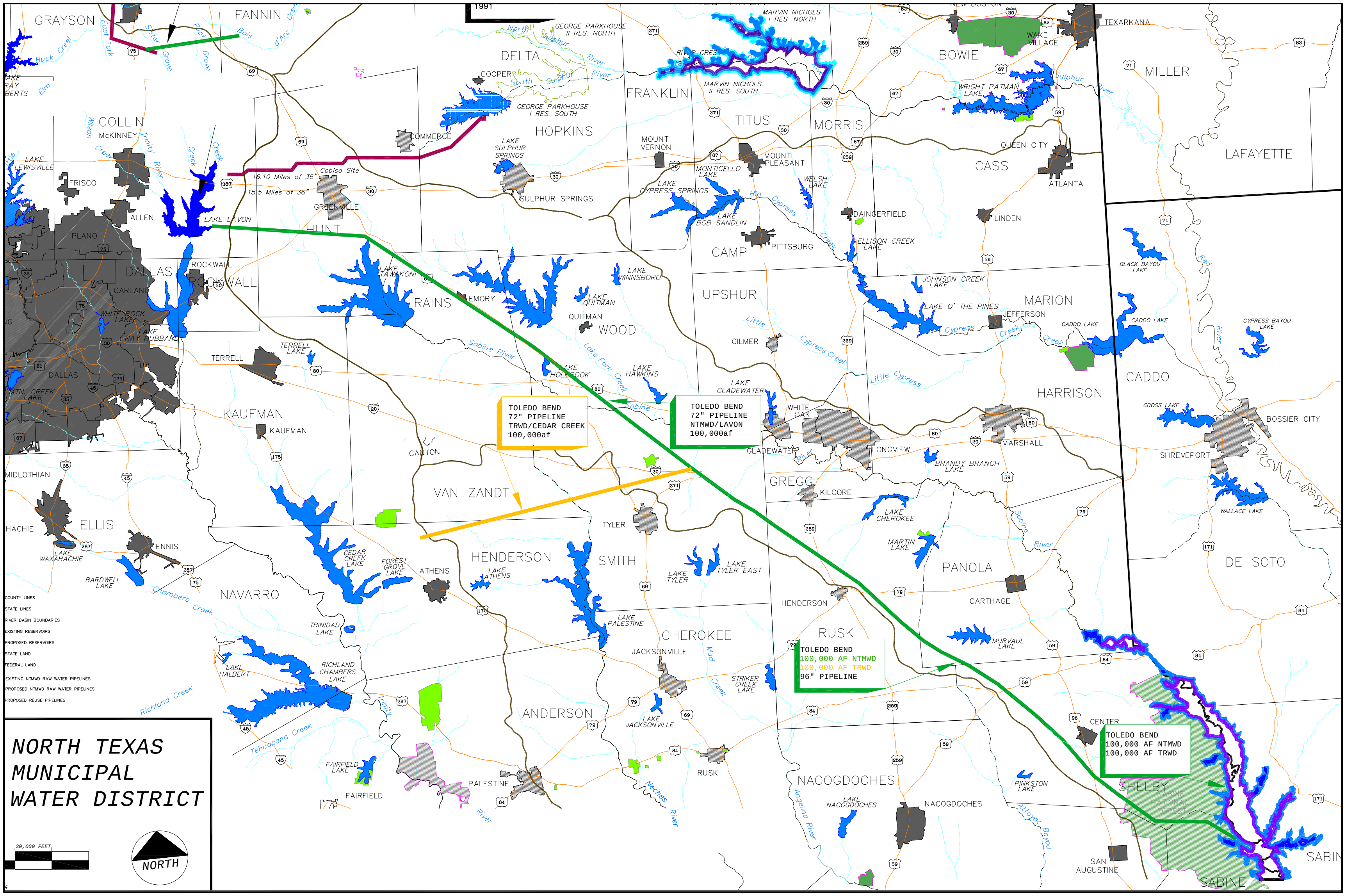
Appendix C, Figure 1
Toledo Bend Concept Map
Source: North Texas Municipal Water District



Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Summary of Toledo Bend Interbasin Transfer Cost Comparison

		TOLEDO BEND		GULF OF MEXICO DESALINATION
Construction (2005 Dollars)				
Pipeline	$	2,319,326,442	$	1,686,146,386
Pump Stations		252,864,668		210,028,286
Terminal Storage and Permitting		78,042,534		49,126,078
Desalination Facilities		-		815,593,241
Interest During Construction		322,453,747		335,918,485
Total Project Cost	**$**	**2,972,687,391**	**$**	**3,096,812,476**
Annual Cost (2005 Dollars)				
Debt Service	$	215,962,503	$	224,980,055
All other Annual Costs (1)		131,729,659		171,216,167
Total Annual Cost	**$**	**347,692,162**	**$**	**396,196,222**
PV (50 year life)	**$**	**7,009,021,964**	**$**	**6,341,778,112**
Acre Feet over 50 year life		**28,200,000**		**9,000,000**
PV Per Acre Foot	**$**	**249**	**$**	**705**

Notes:
(1) Includes all Operation and Maintenance costs

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
Toledo Bend Interbasin Transfer Cost Escalation

	2002	2005 (1)	2008 (1)
CONSTRUCTION COSTS			
TRANSMISSION FACILITIES			
Pipeline			
Pipeline - TB1	$ 586,973,000	$ 666,320,391	$ 729,725,922
Pipeline - TB2	385,762,000	437,909,558	479,580,034
Pipeline - A1	144,881,000	164,466,108	180,116,328
Pipeline - A2	42,279,000	47,994,303	52,561,331
Pipeline - A3 (rural)	41,473,000	47,079,347	51,559,310
Pipeline - A3 (urban)	5,655,000	6,419,447	7,030,306
Pipeline - A4	95,064,000	107,914,813	118,183,741
Pipeline - A5 (rural)	48,680,000	55,260,594	60,519,066
Pipeline - A5 (urban)	9,996,000	11,347,266	12,427,046
Pipeline - B1	49,817,000	56,551,294	61,932,587
Pipeline - B2	107,735,000	122,298,687	133,936,352
Pipeline - B3 (rural)	154,396,000	175,267,352	191,945,393
Pipeline - B3 (urban)	88,966,000	100,992,482	110,602,696
Pipeline - B4 (urban)	49,662,000	56,375,341	61,739,890
Right of Way Easements (rural)	5,559,000	6,074,469	6,637,737
Right of Way Easements (urban)	510,000	557,291	608,967
Less Cost of B2 without TB water (Table R-__)	(61,736,000)	(70,081,513)	(76,750,310)
Less Cost of B3 without TB water (Table R-__)	(158,318,000)	(179,719,530)	(196,821,231)
Less Cost of B4 without TB water (Table R-__)	(38,471,000)	(43,671,535)	(47,827,219)
Permitting & Mitigation	18,634,000	21,152,956	23,165,823
Engineering and Contingencies (30%) (2)	465,844,200	528,817,321	579,138,373
Subtotal of Pipeline	**$ 2,043,361,200**	**$ 2,319,326,442**	**$ 2,540,012,144**
Pump Stations			
Intake and Pump Station - TB1	$ 35,140,000	$ 39,890,248	$ 43,686,113
Booster Pump Station - TB1	26,000,000	29,514,697	32,323,248
Booster Pump Station - TB2	18,250,000	20,717,047	22,688,434
Intake and Pump Station - A1	25,136,000	28,533,901	31,249,122
Booster Pump Station - A2	8,550,000	9,705,795	10,629,376
Intake and Pump Station - A4	19,430,000	22,056,560	24,155,412
Intake and Pump Station - A5	13,520,000	15,347,642	16,808,089
Pump Station - B1	8,020,000	9,104,149	9,970,479
Intake and Pump Station - B2	20,060,000	22,771,724	24,938,629
Ennis Booster Pump Station - B3	16,490,000	18,719,129	20,500,399
Waxahachie Booster Pump Station - B3	16,490,000	18,719,129	20,500,399
Less Cost of B2 without TB water (Table R-__)	(14,378,000)	(16,321,627)	(17,874,756)
Less Cost of Boosters without TB water (Table R-__)	(29,160,000)	(33,101,868)	(36,251,766)
Permitting & Mitigation	1,963,000	2,228,360	2,440,405
Engineering and Contingencies (35%) (3)	57,241,800	64,979,784	71,163,112
Subtotal of Pump Station	**$ 222,752,800**	**$ 252,864,668**	**$ 276,926,694**
Storage Tanks			
Storage - TB1	$ 14,000,000	$ 15,892,529	$ 17,404,826
Storage - TB2	11,000,000	12,486,987	13,675,220
Storage - A2	4,200,000	4,767,759	5,221,448
Earthen Storage - A3	2,000,000	2,270,361	2,486,404
Storage - A5	4,200,000	4,767,759	5,221,448
Storage - B1	4,200,000	4,767,759	5,221,448
Storage - B3	11,000,000	12,486,987	13,675,220
Permitting and mitigation	439,000	498,344	545,766
Engineering and Contingencies (35%) (4)	17,710,000	20,104,049	22,017,105
Subtotal of Storage Tanks	**$ 68,749,000**	**$ 78,042,534**	**$ 85,468,884**
CONSTRUCTION TOTAL	**$ 2,334,863,000**	**$ 2,650,233,645**	**$ 2,902,407,722**
Interest During Construction (5)	**$ 284,082,622**	**$ 322,453,747**	**$ 353,135,749**
TOTAL CONSTRUCTION COST	**$ 2,618,945,622**	**$ 2,972,687,391**	**$ 3,255,543,471**
ANNUAL COSTS			
Debt Service (6% for 30 years)	$ 190,013,000	$ 215,962,503	$ 236,511,689
Operation and Maintenance (6)	25,058,208	28,445,593	31,152,411
All Other Annual Costs (7)	100,275,792	103,284,066	106,382,588
TOTAL ANNUAL COSTS	**$ 315,347,000**	**$ 347,692,162**	**$ 374,046,688**

Notes:
(1) All costs are inflated based upon factors contained in the Construction Cost Index History by ENR (Engineering News-Record) unless otherwise noted
(2) Cost adjusted to exclude Right of Way Easements in percentage calculation; Calculated by applying 30% to all Pipeline Costs excluding Right of Way Easements and Permitting & Mitigation
(3) Calculated by applying 35% to all Pump Station Costs excluding Permitting & Mitigation
(4) Cost adjusted to include Storage - TB1 in percentage calculation; Calculated by applying 35% to all Storage Tanks Costs excluding Permitting & Mitigation
(5) Interest During Construction calculated by applying the same percentage used to calculate Interest During Construction in 2002
(6) Calculated using percentages given in "U-3 Assumptions for Annual Costs"
(7) All other costs inflated at a 3% inflation rate

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Toledo Bend Interbasin Transfer Present Value Calculation

Year	Debt Service	Operations & Maintenance Cost [1]	Total	PV [2]
2005	$ -	$ -	$ -	$ -
2006	-	-	-	-
2007	-	-	-	-
2008	236,511,689	137,534,998	374,046,688	323,115,593
2009	236,511,689	141,661,048	378,172,738	311,123,647
2010	236,511,689	145,910,880	382,422,569	299,638,090
2011	236,511,689	150,288,206	386,799,896	288,636,038
2012	236,511,689	154,796,852	391,308,542	278,095,675
2013	236,511,689	159,440,758	395,952,447	267,996,202
2014	236,511,689	164,223,981	400,735,670	258,317,786
2015	236,511,689	169,150,700	405,662,390	249,041,517
2016	236,511,689	174,225,221	410,736,911	240,149,365
2017	236,511,689	179,451,978	415,963,667	231,624,134
2018	236,511,689	184,835,537	421,347,227	223,449,430
2019	236,511,689	190,380,603	426,892,293	215,609,616
2020	236,511,689	196,092,021	432,603,711	208,089,782
2021	236,511,689	201,974,782	438,486,471	200,875,705
2022	236,511,689	208,034,025	444,545,715	193,953,823
2023	236,511,689	214,275,046	450,786,736	187,311,200
2024	236,511,689	220,703,297	457,214,987	180,935,496
2025	236,511,689	227,324,396	463,836,086	174,814,943
2026	236,511,689	234,144,128	470,655,818	168,938,312
2027	236,511,689	241,168,452	477,680,142	163,294,895
2028	236,511,689	248,403,506	484,915,195	157,874,473
2029	236,511,689	255,855,611	492,367,300	152,667,300
2030	236,511,689	263,531,279	500,042,969	147,664,075
2031	236,511,689	271,437,218	507,948,907	142,855,924
2032	236,511,689	279,580,334	516,092,024	138,234,381
2033	236,511,689	287,967,744	524,479,434	133,791,366
2034	236,511,689	296,606,776	533,118,466	129,519,170
2035	236,511,689	305,504,980	542,016,669	125,410,434
2036	236,511,689	314,670,129	551,181,819	121,458,136
2037	236,511,689	324,110,233	560,621,923	117,655,574
2038	-	333,833,540	333,833,540	66,724,157
2039	-	343,848,546	343,848,546	65,453,221
2040	-	354,164,003	354,164,003	64,206,493
2041	-	364,788,923	364,788,923	62,983,512
2042	-	375,732,590	375,732,590	61,783,826
2043	-	387,004,568	387,004,568	60,606,992
2044	-	398,614,705	398,614,705	59,452,573
2045	-	410,573,146	410,573,146	58,320,143
2046	-	422,890,341	422,890,341	57,209,283
2047	-	435,577,051	435,577,051	56,119,582
2048	-	448,644,362	448,644,362	55,050,638
2049	-	462,103,693	462,103,693	54,002,054
2050	-	475,966,804	475,966,804	52,973,444
2051	-	490,245,808	490,245,808	51,964,426
2052	-	504,953,182	504,953,182	50,974,627
2053	-	520,101,778	520,101,778	50,003,682
2054	-	535,704,831	535,704,831	49,051,231
Total				$ 7,009,021,964

Acre Feet/year	600,000
Years	47
Total Acre Feet	28,200,000
PV/ acre foot	**$ 248.55**

Notes:

(1) O&M Inflated at 3% inflation rate

(2) PV calculation represents mid-year cost

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
Seawater Desalination Cost Escalation

CONSTRUCTION COSTS

	2002	2005 [1]	2010 [1]
TRANSMISSION FACILITIES			
Pipeline			
Pipeline Rural (2 pipelines)	$ 1,066,975,000	$ 1,211,209,373	$ 1,409,333,167
Pipeline Urban (2 pipelines)	66,938,000	75,986,722	88,416,264
Right of Way Easements (Rural)	8,076,000	8,824,863	10,230,435
Right of Way Easements (Urban)	3,630,000	3,966,599	4,598,375
Engineering and Contingencies (30%) [2]	340,174,000	386,158,829	449,324,829
Subtotal of Pipeline	**$ 1,485,793,000**	**$ 1,686,146,386**	**$ 1,961,903,071**
Pump Stations			
Intake and Pump Station at Gulf	$ 17,800,000	$ 20,206,216	$ 23,511,451
Booster Pump Station	89,250,000	101,314,873	117,887,472
Ground Storage Tanks (covered)	30,000,000	34,055,419	39,626,041
Engineering and Contingencies (35%) [3]	47,968,000	54,451,778	63,358,737
Subtotal of Pump Stations	**$ 185,018,000**	**$ 210,028,286**	**$ 244,383,701**
Terminal Storage and Permitting			
Ground Storage Tanks (covered)	$ 22,800,000	$ 25,882,119	$ 30,115,791
Permitting and Mitigation	12,937,600	14,686,513	17,088,862
Permitting of Treatment Plant and Reject Stream	7,538,400	8,557,446	9,957,232
Subtotal Terminal Storage and Permitting	**$ 43,276,000**	**$ 49,126,078**	**$ 57,161,885**
WATER TREATMENT FACILITIES			
Treatment Plant with RO	$ 532,200,000	$ 604,143,141	$ 702,965,966
Engineering and Contingencies (35%) [4]	186,270,000	211,450,100	246,038,088
Subtotal of Water Treatment	**$ 718,470,000**	**$ 815,593,241**	**$ 949,004,054**
CONSTRUCTION TOTAL	**$ 2,432,557,000**	**$ 2,760,893,991**	**$ 3,212,452,711**
Interest During Construction [5]	**$ 295,969,662**	**$ 335,918,485**	**$ 390,859,718**
TOTAL CAPITAL COST	**$ 2,728,526,662**	**$ 3,096,812,476**	**$ 3,603,312,430**
ANNUAL COSTS			
Debt Service (6% for 30 years)	$ 206,047,351	$ 224,980,055	$ 261,776,726
Electricity [6]	37,722,000	42,117,058	52,676,903
Facility Operation and Maintenance [7]	18,402,456	20,890,112	24,307,216
Water Treatment [8]	97,755,300	104,950,487	127,830,131
Reject Water Disposal [9]	3,258,510	3,258,510	3,258,510
TOTAL ANNUAL COSTS	**$ 363,185,617**	**$ 396,196,222**	**$ 469,849,486**

Notes:
(1) All costs are inflated based upon factors contained in the Construction Cost Index History by ENR (Engineering News-Record) unless otherwise noted
(2) Calculated by applying 30% to all Pipeline Costs excluding Right of Way Easements
(3) Calculated by applying 35% to all Pump Station Costs
(4) Calculated by applying 35% to Treatment Plant with RO
(5) Interest During Construction calculated by applying the same percentage used to calculate Interest During Construction in 2002
(6) Cost escalated using the Producer Price Industrial Electric Power Index; 2002 cost estimated at $0.06 kwh per Exhibit B of the TWDB planning guidelines
(7) Calculated using percentages given in "U-3 Assumptions for Annual Costs"
(8) Water Treatment cost escalated using the Handy-Whitman NARUC - account 320; 2002 cost estimated at $1.50 per 1,000 gallons per Region C Plan appendix U-19
(9) Held constant at $0.05 per 1,000 gallons per discussions with Freese and Nichols

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Seawater Desalination Present Value Calculation

		Operations & Maintenance Cost					
Year	Debt Service	Electricity (1)	Misc. (2)	Water Treatment (3)	Reject Water (4)	Total	PV (5)
2005	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2006	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-
2010	261,776,726	52,676,903	24,307,216	24,307,216	3,258,510	366,326,571	287,026,454
2011	261,776,726	55,087,451	25,036,432	25,285,117	3,258,510	370,444,237	276,431,193
2012	261,776,726	57,608,308	25,787,525	26,302,361	3,258,510	374,733,430	266,316,052
2013	261,776,726	60,244,522	26,561,151	27,360,528	3,258,510	379,201,438	256,658,459
2014	261,776,726	63,001,372	27,357,986	28,461,267	3,258,510	383,855,861	247,436,910
2015	261,776,726	65,884,378	28,178,725	29,606,290	3,258,510	388,704,629	238,630,923
2016	261,776,726	68,899,313	29,024,087	30,797,378	3,258,510	393,756,014	230,220,986
2017	261,776,726	72,052,215	29,894,809	32,036,385	3,258,510	399,018,645	222,188,512
2018	261,776,726	75,349,396	30,791,654	33,325,238	3,258,510	404,501,523	214,515,794
2019	261,776,726	78,797,460	31,715,403	34,665,942	3,258,510	410,214,042	207,185,966
2020	261,776,726	82,403,311	32,666,865	36,060,585	3,258,510	416,165,997	200,182,960
2021	261,776,726	86,174,169	33,646,871	37,511,335	3,258,510	422,367,611	193,491,469
2022	261,776,726	90,117,585	34,656,278	39,020,450	3,258,510	428,829,549	187,096,912
2023	261,776,726	94,241,456	35,695,966	40,590,278	3,258,510	435,562,936	180,985,397
2024	261,776,726	98,554,040	36,766,845	42,223,262	3,258,510	442,579,383	175,143,690
2025	261,776,726	103,063,971	37,869,850	43,921,943	3,258,510	449,891,000	169,559,186
2026	261,776,726	107,780,282	39,005,946	45,688,962	3,258,510	457,510,426	164,219,874
2027	261,776,726	112,712,416	40,176,124	47,527,071	3,258,510	465,450,847	159,114,312
2028	261,776,726	117,870,249	41,381,408	49,439,128	3,258,510	473,726,021	154,231,599
2029	261,776,726	123,264,110	42,622,850	51,428,110	3,258,510	482,350,305	149,561,351
2030	261,776,726	128,904,799	43,901,536	53,497,109	3,258,510	491,338,679	145,093,674
2031	261,776,726	134,803,611	45,218,582	55,649,347	3,258,510	500,706,776	140,819,142
2032	261,776,726	140,972,360	46,575,139	57,888,171	3,258,510	510,470,905	136,728,774
2033	261,776,726	147,423,396	47,972,393	60,217,064	3,258,510	520,648,090	132,814,015
2034	261,776,726	154,169,639	49,411,565	62,639,652	3,258,510	531,256,091	129,066,713
2035	261,776,726	161,224,596	50,893,912	65,159,702	3,258,510	542,313,446	125,479,101
2036	261,776,726	168,602,395	52,420,729	67,781,136	3,258,510	553,839,496	122,043,781
2037	261,776,726	176,317,809	53,993,351	70,508,033	3,258,510	565,854,430	118,753,700
2038	261,776,726	184,386,289	55,613,152	73,344,636	3,258,510	578,379,312	115,602,142
2039	261,776,726	192,823,990	57,281,546	76,295,357	3,258,510	591,436,130	112,582,706
2040	-	201,647,809	58,999,993	79,364,789	3,258,510	343,271,101	62,231,716
2041	-	210,875,415	60,769,993	82,557,707	3,258,510	357,461,624	61,718,400
2042	-	220,525,286	62,593,092	85,879,078	3,258,510	372,255,966	61,212,145
2043	-	230,616,744	64,470,885	89,334,072	3,258,510	387,680,211	60,712,801
2044	-	241,169,997	66,405,012	92,928,063	3,258,510	403,761,582	60,220,219
2045	-	252,206,178	68,397,162	96,666,644	3,258,510	420,528,493	59,734,257
2046	-	263,747,385	70,449,077	100,555,631	3,258,510	438,010,603	59,254,776
2047	-	275,816,730	72,562,549	104,601,075	3,258,510	456,238,864	58,781,642
2048	-	288,438,380	74,739,426	108,809,272	3,258,510	475,245,587	58,314,725
2049	-	301,637,609	76,981,608	113,186,768	3,258,510	495,064,496	57,853,898
2050	-	315,440,849	79,291,057	117,740,375	3,258,510	515,730,790	57,399,036
2051	-	329,875,738	81,669,788	122,477,177	3,258,510	537,281,214	56,950,022
2052	-	344,971,182	84,119,882	127,404,546	3,258,510	559,754,120	56,506,739
2053	-	360,757,409	86,643,478	132,530,147	3,258,510	583,189,544	56,069,073
2054	-	377,266,030	89,242,783	137,861,955	3,258,510	607,629,278	55,636,915
Total							$ 6,341,778,112

Notes;
(1) Inflated by the Industrial Electric Power index
(2) Inflated by the inflation factor
(3) Inflated by the Handy-Whitman Large Treatment Facility Index
(4) Held constant at $0.05 per thousand gallons per conversation with Freese and Nichols
(5) Half year convention applied to PV calculation

Acre Feet / year	200,000
Years	45
Total Acre-Feet	9,000,000
PV / acre-foot	**$ 704.64**

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Socioeconomic Impact of Toledo Bend Interbasin Transfer
Present Value Summary

Basin of Origin Benefits (SRA)		
Commerce from New Residents		
Harrison	$	5,665,848,006
Rusk		2,818,769,202
Wood		1,954,910,384
Economic Development [1]		
Upper Basin		90,741,428
Lower Basin		20,097,948
Total Benefits (discounted)	**$**	**10,550,366,968**
Receiving Basin Benefits (DWU, NTMWD, TRWD)		
Commerce from New Residents		
Dallas Water Utilities		435,376,917,179
North Texas Municipal Water District		401,203,678,455
Tarrant Regional Water District		464,107,346,540
Total Benefits to the Receiving Basin (discounted)	**$**	**1,300,687,942,173**
TOTAL NET ECONOMIC IMPACT (discounted to Year 2005)	**$**	**1,311,238,309,142**

Notes:
(1) Reflects payment to SRA by DWU, NTWMD, and TRWD as calculated by R.W. Beck
These numbers are estimates and have not been agreed to by the parties.

ANNUAL CALCULATION - SRA

	$-Value per year	(Applicable for income only) disposable	locally spent	Multiplier effect (ME)	$-Value per year w/ ME	Year of Value	First Year of Impact	Last Year of Impact
Benefits to SRA								
Commerce from New Residents [1]								
SRA - Harrison								
Per Capita Income (disposable, locally spent)	$ 24,053	89.7%	52.8%	1.33	$ 15,167	1999		
Assumed increase in population							2008	2054
Commerce from New Residents							2008	2054
SRA - Rusk								
Per Capita Income (disposable, locally spent)	$ 22,698	91.6%	46.6%	1.21	$ 11,711	1999		
Assumed increase in population							2008	2054
Commerce from New Residents							2008	2054
SRA - Wood								
Per Capita Income (disposable, locally spent)	$ 20,804	94.3%	48.5%	1.29	$ 12,253	1999		
Assumed increase in population							2008	2054
Commerce from New Residents							2008	2054
Total Benefits								
Economic Development [2]								
Upper Basin								
Collin				1.39			2008	2054
Rockwall				1.28			2008	2054
Hunt				1.25			2008	2054
Kaufman				1.24			2008	2054
Van Zandt				1.16			2008	2054
Rains				1.17			2008	2054
Hopkins				1.18			2008	2054
Wood				1.29			2008	2054
Smith				1.44			2008	2054
Franklin				1.18			2008	2054
Upshur				1.18			2008	2054
Gregg				1.40			2008	2054
Rusk				1.21			2008	2054
Harrison				1.33			2008	2054
Panola				1.20			2008	2054
Total Upper Basin Benefits								
Lower Basin								
Shelby				1.21			2008	2054
San Augustine				1.13			2008	2054
Sabine				1.10			2008	2054
Jasper				1.22			2008	2054
Newton				1.07			2008	2054
Orange				1.23			2008	2054
Total Lower Basin Benefits								

(1) SRA Comprehensive Sabine Watershed Management Plan (Dec 1999), 80% of water to Harrison, 10% to Rusk, 10% to Wood
(2) It is assumed that the Maintenance and Interbasin Transfer fee will be used for Economic Development in the Sabine Basin

ANNUAL CALCULATION - SRA

	2005	2006	2007	2008	2009	2010	2011
Benefits to SRA							
Commerce from New Residents [1]							
SRA - Harrison							
Per Capita Income (disposable, locally spent)				$ 19,789	$ 20,383	$ 20,995	$ 21,624
Assumed increase in population				517	1,035	1,552	2,069
Commerce from New Residents				$ 10,238,030	$ 21,090,341	$ 32,584,577	$ 44,749,485
SRA - Rusk							
Per Capita Income (disposable, locally spent)				$ 15,281	$ 15,739	$ 16,211	$ 16,698
Assumed increase in population				333	667	1,000	1,333
Commerce from New Residents				$ 5,093,437	$ 10,492,481	$ 16,210,883	$ 22,262,947
SRA - Wood							
Per Capita Income (disposable, locally spent)				$ 15,988	$ 16,467	$ 16,961	$ 17,470
Assumed increase in population				221	442	663	884
Commerce from New Residents				3,532,469	7,276,885	11,242,788	15,440,095
Total Benefits				$ 18,863,936	$ 38,859,708	$ 60,038,248	$ 82,452,527
Economic Development [2]							
Upper Basin							
Collin	$ 212,689.48	$ 218,515.87	$ 224,517.06	$ 230,698.28	$ 237,064.94	$ 339,779.90	$ 346,291.79
Rockwall	56,933	58,493	60,099	61,754	63,458	90,953	92,696
Hunt	295,831	303,935	312,282	320,880	329,735	472,602	481,660
Kaufman	17,365	17,841	18,331	18,835	19,355	27,741	28,273
Van Zandt	111,212	114,258	117,396	120,628	123,957	177,665	181,070
Rains	53,998	55,477	57,001	58,570	60,186	86,264	87,917
Hopkins	49,123	50,468	51,854	53,282	54,752	78,475	79,979
Wood	209,896	215,646	221,568	227,669	233,952	335,318	341,744
Smith	509,266	523,217	537,586	552,386	567,631	813,573	829,165
Franklin	2,485	2,553	2,624	2,696	2,770	3,971	4,047
Upshur	50,361	51,741	53,162	54,626	56,133	80,454	81,996
Gregg	615,600	632,463	649,833	667,724	686,151	983,445	1,002,293
Rusk	120,511	123,812	127,213	130,715	134,322	192,521	196,211
Harrison	148,330	152,393	156,578	160,889	165,329	236,962	241,504
Panola	117,093	120,301	123,605	127,008	130,513	187,061	190,646
Total Upper Basin Benefits	$ 2,570,693.39	$ 2,641,114.69	$ 2,713,648.62	$ 2,788,358.58	$ 2,865,309.83	$ 4,106,784.83	$ 4,185,491.51
Lower Basin							
Shelby	$ 105,444.15	$ 108,332.67	$ 111,307.85	$ 114,372.29	$ 117,528.66	$ 168,451.21	$ 171,679.58
San Augustine	3,413	3,507	3,603	3,702	3,804	5,453	5,557
Sabine	42,692	43,861	45,066	46,306	47,584	68,201	69,508
Jasper	102,246	105,047	107,932	110,903	113,964	163,342	166,473
Newton	68,022	69,885	71,804	73,781	75,817	108,667	110,750
Orange	247,556	254,337	261,322	268,517	275,927	395,480	403,060
Total Lower Basin Benefits	$ 569,372.38	$ 584,969.70	$ 601,034.95	$ 617,582.15	$ 634,625.77	$ 909,594.99	$ 927,027.41

(1) SRA Comprehensive Sabine Watershed Manageme

(2) It is assumed that the Maintenance and Interbasin T

ANNUAL CALCULATION - SRA

	2012	2013	2014	2015	2016	2017	2018
Benefits to SRA							
Commerce from New Residents (1)							
SRA - Harrison							
Per Capita Income (disposable, locally spent)	$ 22,273	$ 22,941	$ 23,630	$ 24,338	$ 25,069	$ 25,821	$ 26,595
Assumed increase in population	2,587	3,104	3,621	4,139	4,656	5,174	5,691
Commerce from New Residents	$ 57,614,963	$ 71,212,094	$ 85,573,199	$ 100,731,880	$ 116,723,066	$ 133,583,065	$ 151,349,612
SRA - Rusk							
Per Capita Income (disposable, locally spent)	$ 17,199	$ 17,715	$ 18,246	$ 18,793	$ 19,357	$ 19,938	$ 20,536
Assumed increase in population	1,667	2,000	2,333	2,667	3,000	3,333	3,667
Commerce from New Residents	$ 28,663,544	$ 35,428,140	$ 42,572,815	$ 50,114,285	$ 58,069,928	$ 66,457,806	$ 75,296,694
SRA - Wood							
Per Capita Income (disposable, locally spent)	$ 17,994	$ 18,534	$ 19,090	$ 19,663	$ 20,253	$ 20,860	$ 21,486
Assumed increase in population	1,105	1,326	1,547	1,768	1,989	2,210	2,430
Commerce from New Residents	19,879,123	24,570,596	29,525,666	34,755,927	40,273,430	46,090,703	52,220,767
Total Benefits	$ 106,157,629	$ 131,210,830	$ 157,671,680	$ 185,602,092	$ 215,066,424	$ 246,131,574	$ 278,867,074
Economic Development (2)							
Upper Basin							
Collin	$ 353,404.20	$ 360,669.63	$ 367,668.63	$ 375,286.92	$ 383,503.32	$ 391,445.38	$ 472,366.81
Rockwall	94,600	96,544	98,418	100,457	102,657	104,782	126,444
Hunt	491,552	501,658	511,393	521,989	533,417	544,464	657,018
Kaufman	28,854	29,447	30,018	30,640	31,311	31,959	38,566
Van Zandt	184,789	188,588	192,248	196,231	200,527	204,680	246,993
Rains	89,722	91,567	93,344	95,278	97,364	99,380	119,925
Hopkins	81,622	83,300	84,916	86,676	88,574	90,408	109,097
Wood	348,763	355,933	362,840	370,358	378,467	386,305	466,163
Smith	846,195	863,591	880,350	898,591	918,264	937,281	1,131,040
Franklin	4,130	4,215	4,296	4,385	4,481	4,574	5,520
Upshur	83,680	85,401	87,058	88,862	90,807	92,688	111,849
Gregg	1,022,879	1,043,908	1,064,165	1,086,215	1,109,996	1,132,984	1,367,199
Rusk	200,241	204,357	208,323	212,640	217,295	221,795	267,646
Harrison	246,464	251,531	256,412	261,725	267,455	272,994	329,429
Panola	194,562	198,562	202,415	206,609	211,132	215,505	260,055
Total Upper Basin Benefits	$ 4,271,456.34	$ 4,359,270.74	$ 4,443,864.83	$ 4,535,944.18	$ 4,635,252.55	$ 4,731,245.03	$ 5,709,310.23
Lower Basin							
Shelby	$ 175,205.67	$ 178,807.62	$ 182,277.49	$ 186,054.38	$ 190,127.79	$ 194,065.18	$ 234,183.25
San Augustine	5,671	5,788	5,900	6,022	6,154	6,282	7,580
Sabine	70,936	72,394	73,799	75,328	76,978	78,572	94,815
Jasper	169,892	173,385	176,749	180,412	184,361	188,179	227,081
Newton	113,025	115,348	117,587	120,023	122,651	125,191	151,071
Orange	411,338	419,795	427,941	436,808	446,371	455,615	549,802
Total Lower Basin Benefits	$ 946,067.41	$ 965,517.06	$ 984,253.46	$ 1,004,647.74	$ 1,026,643.15	$ 1,047,904.13	$ 1,264,531.80

(1) SRA Comprehensive Sabine Watershed Manageme
(2) It is assumed that the Maintenance and Interbasin T

ANNUAL CALCULATION - SRA

	2019	2020	2021	2022	2023	2024	2025
Benefits to SRA							
Commerce from New Residents [1]							
SRA - Harrison							
Per Capita Income (disposable, locally spent)	$ 27,393	$ 28,215	$ 29,061	$ 29,933	$ 30,831	$ 31,756	$ 32,709
Assumed increase in population	6,208	6,726	7,243	7,760	8,278	8,795	9,312
Commerce from New Residents	$ 170,061,928	$ 189,760,768	$ 210,488,483	$ 232,289,076	$ 255,208,264	$ 279,293,544	$ 304,594,254
SRA - Rusk							
Per Capita Income (disposable, locally spent)	$ 21,152	$ 21,787	$ 22,440	$ 23,113	$ 23,807	$ 24,521	$ 25,257
Assumed increase in population	4,000	4,333	4,667	5,000	5,333	5,667	6,000
Commerce from New Residents	$ 84,606,104	$ 94,406,311	$ 104,718,385	$ 115,564,218	$ 126,966,554	$ 138,949,022	$ 151,536,169
SRA - Wood							
Per Capita Income (disposable, locally spent)	$ 22,131	$ 22,795	$ 23,478	$ 24,183	$ 24,908	$ 25,655	$ 26,425
Assumed increase in population	2,651	2,872	3,093	3,314	3,535	3,756	3,977
Commerce from New Residents	58,677,153	65,473,923	72,625,690	80,147,636	88,055,537	96,365,778	105,095,384
Total Benefits	$ 313,345,185	$ 349,641,002	$ 387,832,558	$ 428,000,930	$ 470,230,355	$ 514,608,344	$ 561,225,806
Economic Development [2]							
Upper Basin							
Collin	$ 478,980.83	$ 485,725.77	$ 492,285.58	$ 499,652.96	$ 506,826.32	$ 514,154.97	$ 521,967.35
Rockwall	128,214	130,020	131,775	133,748	135,668	137,629	139,721
Hunt	666,218	675,599	684,723	694,971	704,948	715,142	726,008
Kaufman	39,106	39,657	40,193	40,794	41,380	41,978	42,616
Van Zandt	250,451	253,978	257,408	261,260	265,011	268,843	272,928
Rains	121,604	123,316	124,982	126,852	128,673	130,534	132,517
Hopkins	110,625	112,183	113,698	115,399	117,056	118,749	120,553
Wood	472,690	479,347	485,820	493,091	500,170	507,403	515,112
Smith	1,146,877	1,163,027	1,178,734	1,196,374	1,213,550	1,231,098	1,249,804
Franklin	5,597	5,676	5,753	5,839	5,923	6,008	6,100
Upshur	113,415	115,012	116,565	118,310	120,008	121,743	123,593
Gregg	1,386,343	1,405,865	1,424,851	1,446,175	1,466,938	1,488,149	1,510,761
Rusk	271,393	275,215	278,932	283,106	287,171	291,323	295,750
Harrison	334,041	338,745	343,320	348,458	353,461	358,572	364,020
Panola	263,696	267,409	271,021	275,077	279,026	283,061	287,362
Total Upper Basin Benefits	$ 5,789,251.26	$ 5,870,774.74	$ 5,950,060.52	$ 6,039,107.12	$ 6,125,808.72	$ 6,214,387.18	$ 6,308,812.27
Lower Basin							
Shelby	$ 237,462.25	$ 240,806.17	$ 244,058.29	$ 247,710.79	$ 251,267.10	$ 254,900.39	$ 258,773.50
San Augustine	7,686	7,795	7,900	8,018	8,133	8,251	8,376
Sabine	96,142	97,496	98,813	100,291	101,731	103,202	104,770
Jasper	230,260	233,503	236,656	240,198	243,646	247,169	250,925
Newton	153,186	155,343	157,441	159,797	162,091	164,435	166,934
Orange	557,501	565,351	572,986	581,562	589,911	598,441	607,534
Total Lower Basin Benefits	$ 1,282,237.61	$ 1,300,293.91	$ 1,317,854.59	$ 1,337,577.16	$ 1,356,780.34	$ 1,376,399.23	$ 1,397,313.05

(1) SRA Comprehensive Sabine Watershed Manageme
(2) It is assumed that the Maintenance and Interbasin T

ANNUAL CALCULATION - SRA

	2026	2027	2028	2029	2030	2031	2032
Benefits to SRA							
Commerce from New Residents [1]							
SRA - Harrison							
Per Capita Income (disposable, locally spent)	$ 33,690	$ 34,701	$ 35,742	$ 36,814	$ 37,918	$ 39,056	$ 40,228
Assumed increase in population	9,830	10,347	10,864	11,382	11,899	12,416	12,934
Commerce from New Residents	$ 331,161,641	$ 359,048,937	$ 388,311,426	$ 419,006,520	$ 451,193,839	$ 484,935,291	$ 520,295,156
SRA - Rusk							
Per Capita Income (disposable, locally spent)	$ 26,014	$ 26,795	$ 27,599	$ 28,427	$ 29,279	$ 30,158	$ 31,063
Assumed increase in population	6,333	6,667	7,000	7,333	7,666	8,000	8,333
Commerce from New Residents	$ 164,753,490	$ 178,627,469	$ 193,185,607	$ 208,456,470	$ 224,469,717	$ 241,256,148	$ 258,847,742
SRA - Wood							
Per Capita Income (disposable, locally spent)	$ 27,218	$ 28,034	$ 28,875	$ 29,742	$ 30,634	$ 31,553	$ 32,500
Assumed increase in population	4,198	4,419	4,640	4,861	5,082	5,303	5,524
Commerce from New Residents	114,262,036	123,884,103	133,980,657	144,571,509	155,677,229	167,319,179	179,519,536
Total Benefits	$ 610,177,168	$ 661,560,509	$ 715,477,690	$ 772,034,498	$ 831,340,785	$ 893,510,617	$ 958,662,433
Economic Development [2]							
Upper Basin							
Collin	$ 529,927.26	$ 538,041.66	$ 546,639.60	$ 555,385.51	$ 564,287.00	$ 573,351.88	$ 582,910.10
Rockwall	141,851	144,024	146,325	148,666	151,049	153,475	156,034
Hunt	737,080	748,366	760,325	772,490	784,871	797,479	810,774
Kaufman	43,266	43,928	44,630	45,344	46,071	46,811	47,592
Van Zandt	277,090	281,333	285,829	290,402	295,056	299,796	304,794
Rains	134,538	136,598	138,781	141,002	143,262	145,563	147,990
Hopkins	122,392	124,266	126,251	128,271	130,327	132,421	134,628
Wood	522,968	530,976	539,461	548,092	556,876	565,822	575,255
Smith	1,268,863	1,288,293	1,308,880	1,329,821	1,351,135	1,372,840	1,395,726
Franklin	6,193	6,287	6,388	6,490	6,594	6,700	6,812
Upshur	125,478	127,399	129,435	131,506	133,614	135,760	138,024
Gregg	1,533,800	1,557,286	1,582,171	1,607,485	1,633,249	1,659,486	1,687,151
Rusk	300,260	304,857	309,729	314,685	319,728	324,864	330,280
Harrison	369,571	375,230	381,226	387,326	393,534	399,856	406,521
Panola	291,744	296,211	300,945	305,760	310,660	315,651	320,913
Total Upper Basin Benefits	$ 6,405,020.57	$ 6,503,096.11	$ 6,607,015.99	$ 6,712,724.38	$ 6,820,313.09	$ 6,929,876.70	$ 7,045,403.16
Lower Basin							
Shelby	$ 262,719.75	$ 266,742.59	$ 271,005.15	$ 275,341.08	$ 279,754.13	$ 284,248.18	$ 288,986.82
San Augustine	8,504	8,634	8,772	8,912	9,055	9,201	9,354
Sabine	106,368	107,997	109,723	111,478	113,265	115,084	117,003
Jasper	254,752	258,653	262,786	266,990	271,269	275,627	280,222
Newton	169,480	172,075	174,824	177,621	180,468	183,367	186,424
Orange	616,799	626,243	636,251	646,430	656,791	667,342	678,467
Total Lower Basin Benefits	$ 1,418,621.83	$ 1,440,344.19	$ 1,463,360.98	$ 1,486,773.89	$ 1,510,603.28	$ 1,534,870.07	$ 1,560,457.56

(1) SRA Comprehensive Sabine Watershed Manageme
(2) It is assumed that the Maintenance and Interbasin T

ANNUAL CALCULATION - SRA

	2033	2034	2035	2036	2037	2038	2039
Benefits to SRA							
Commerce from New Residents [1]							
SRA - Harrison							
Per Capita Income (disposable, locally spent)	$ 41,435	$ 42,678	$ 43,958	$ 45,277	$ 46,635	$ 48,034	$ 49,475
Assumed increase in population	13,451	13,968	14,486	15,003	15,521	16,038	16,555
Commerce from New Residents	$ 557,340,171	$ 596,139,621	$ 636,765,432	$ 679,292,267	$ 723,797,622	$ 770,361,936	$ 819,068,690
SRA - Rusk							
Per Capita Income (disposable, locally spent)	$ 31,994	$ 32,954	$ 33,943	$ 34,961	$ 36,010	$ 37,090	$ 38,203
Assumed increase in population	8,666	9,000	9,333	9,666	10,000	10,333	10,666
Commerce from New Residents	$ 277,277,701	$ 296,580,495	$ 316,791,906	$ 337,949,080	$ 360,090,571	$ 383,256,398	$ 407,488,093
SRA - Wood							
Per Capita Income (disposable, locally spent)	$ 33,475	$ 34,479	$ 35,513	$ 36,579	$ 37,676	$ 38,806	$ 39,970
Assumed increase in population	5,745	5,966	6,187	6,408	6,629	6,849	7,070
Commerce from New Residents	192,301,327	205,688,457	219,705,745	234,378,950	249,734,812	265,801,085	282,606,573
Total Benefits	$ 1,026,919,198	$ 1,098,408,573	$ 1,173,263,083	$ 1,251,620,296	$ 1,333,623,005	$ 1,419,419,419	$ 1,509,163,356
Economic Development [2]							
Upper Basin							
Collin	$ 592,627.03	$ 600,944.58	$ 526,679.13	$ 537,372.00	$ 548,385.66	$ 559,729.72	$ 571,414.11
Rockwall	158,635	160,861	140,982	143,844	146,792	149,829	152,957
Hunt	824,289	835,858	732,562	747,435	762,753	778,532	794,784
Kaufman	48,385	49,064	43,001	43,874	44,773	45,699	46,653
Van Zandt	309,875	314,224	275,392	280,983	286,742	292,673	298,783
Rains	150,457	152,568	133,714	136,428	139,224	142,105	145,071
Hopkins	136,873	138,794	121,641	124,111	126,655	129,275	131,973
Wood	584,844	593,052	519,762	530,315	541,184	552,379	563,910
Smith	1,418,992	1,438,908	1,261,086	1,286,689	1,313,060	1,340,223	1,368,200
Franklin	6,925	7,022	6,155	6,280	6,408	6,541	6,677
Upshur	140,324	142,294	124,709	127,241	129,849	132,535	135,302
Gregg	1,715,276	1,739,350	1,524,399	1,555,348	1,587,225	1,620,059	1,653,878
Rusk	335,786	340,499	298,419	304,478	310,718	317,146	323,766
Harrison	413,298	419,099	367,306	374,763	382,444	390,355	398,504
Panola	326,262	330,841	289,956	295,842	301,906	308,151	314,584
Total Upper Basin Benefits	$ 7,162,847.83	$ 7,263,378.80	$ 6,365,761.72	$ 6,495,002.21	$ 6,628,119.91	$ 6,765,231.14	$ 6,906,455.71
Lower Basin							
Shelby	$ 293,804.14	$ 297,927.70	$ 261,109.44	$ 266,410.59	$ 271,870.79	$ 277,494.79	$ 283,287.50
San Augustine	9,510	9,644	8,452	8,623	8,800	8,982	9,170
Sabine	118,953	120,623	105,716	107,863	110,073	112,350	114,696
Jasper	284,893	288,892	253,190	258,331	263,625	269,079	274,696
Newton	189,532	192,192	168,441	171,860	175,383	179,011	182,748
Orange	689,777	699,458	613,018	625,464	638,283	651,487	665,087
Total Lower Basin Benefits	$ 1,586,469.90	$ 1,608,736.09	$ 1,409,926.55	$ 1,438,551.50	$ 1,468,035.20	$ 1,498,403.40	$ 1,529,682.66

(1) SRA Comprehensive Sabine Watershed Manageme
(2) It is assumed that the Maintenance and Interbasin T

ANNUAL CALCULATION - SRA

	2040	2041	2042	2043	2044	2045	2046
Benefits to SRA							
Commerce from New Residents [1]							
SRA - Harrison							
Per Capita Income (disposable, locally spent)	$ 50,959	$ 52,488	$ 54,063	$ 55,685	$ 57,355	$ 59,076	$ 60,848
Assumed increase in population	17,073	17,590	18,107	18,625	19,142	19,659	20,177
Commerce from New Residents	$ 870,004,525	$ 923,259,347	$ 978,926,455	$ 1,037,102,655	$ 1,097,888,394	$ 1,161,387,885	$ 1,227,709,246
SRA - Rusk							
Per Capita Income (disposable, locally spent)	$ 39,349	$ 40,530	$ 41,745	$ 42,998	$ 44,288	$ 45,616	$ 46,985
Assumed increase in population	11,000	11,333	11,666	12,000	12,333	12,666	13,000
Commerce from New Residents	$ 432,828,759	$ 459,323,125	$ 487,017,608	$ 515,960,368	$ 546,201,379	$ 577,792,486	$ 610,787,478
SRA - Wood							
Per Capita Income (disposable, locally spent)	$ 41,169	$ 42,405	$ 43,677	$ 44,987	$ 46,337	$ 47,727	$ 49,159
Assumed increase in population	7,291	7,512	7,733	7,954	8,175	8,396	8,617
Commerce from New Residents	300,181,169	318,555,895	337,762,942	357,835,711	378,808,860	400,718,345	423,601,472
Total Benefits	$ 1,603,014,453	$ 1,701,138,367	$ 1,803,707,004	$ 1,910,898,735	$ 2,022,898,633	$ 2,139,898,716	$ 2,262,098,195
Economic Development [2]							
Upper Basin							
Collin	$ 583,449.03	$ 595,845.00	$ 608,612.85	$ 621,763.73	$ 635,309.14	$ 649,260.91	$ 663,631.23
Rockwall	156,178	159,496	162,914	166,434	170,060	173,795	177,641
Hunt	811,523	828,765	846,524	864,816	883,656	903,062	923,049
Kaufman	47,636	48,648	49,690	50,764	51,870	53,009	54,182
Van Zandt	305,076	311,557	318,233	325,110	332,193	339,488	347,002
Rains	148,126	151,274	154,515	157,854	161,293	164,835	168,483
Hopkins	134,753	137,616	140,565	143,602	146,730	149,953	153,272
Wood	575,787	588,020	600,620	613,598	626,966	640,734	654,916
Smith	1,397,017	1,426,698	1,457,269	1,488,758	1,521,191	1,554,597	1,589,006
Franklin	6,818	6,963	7,112	7,266	7,424	7,587	7,755
Upshur	138,151	141,086	144,110	147,223	150,431	153,734	157,137
Gregg	1,688,711	1,724,590	1,761,544	1,799,608	1,838,813	1,879,194	1,920,787
Rusk	330,585	337,609	344,843	352,295	359,970	367,875	376,017
Harrison	406,897	415,542	424,447	433,618	443,065	452,795	462,816
Panola	321,210	328,034	335,063	342,303	349,760	357,441	365,353
Total Upper Basin Benefits	$ 7,051,917.02	$ 7,201,742.16	$ 7,356,062.06	$ 7,515,011.56	$ 7,678,729.54	$ 7,847,359.06	$ 8,021,047.47
Lower Basin							
Shelby	$ 289,254.01	$ 295,399.50	$ 301,729.36	$ 308,249.12	$ 314,964.47	$ 321,881.27	$ 329,005.59
San Augustine	9,363	9,562	9,767	9,978	10,195	10,419	10,649
Sabine	117,111	119,599	122,162	124,802	127,521	130,321	133,206
Jasper	280,481	286,440	292,578	298,900	305,412	312,119	319,027
Newton	186,597	190,561	194,644	198,850	203,182	207,644	212,240
Orange	679,094	693,523	708,383	723,690	739,456	755,695	772,421
Total Lower Basin Benefits	$ 1,561,900.29	$ 1,595,084.45	$ 1,629,264.13	$ 1,664,469.20	$ 1,700,730.43	$ 1,738,079.49	$ 1,776,549.03

(1) SRA Comprehensive Sabine Watershed Manageme

(2) It is assumed that the Maintenance and Interbasin T

ANNUAL CALCULATION - SRA

	2047	2048	2049	2050	2051	2052	2053
<u>Benefits to SRA</u>							
Commerce from New Residents [(1)]							
SRA - Harrison							
Per Capita Income (disposable, locally spent)	$ 62,673	$ 64,554	$ 66,490	$ 68,485	$ 70,540	$ 72,656	$ 74,835
Assumed increase in population	20,694	21,211	21,729	22,246	22,763	23,281	23,798
Commerce from New Residents	$ 1,296,964,639	$ 1,369,270,418	$ 1,444,747,275	$ 1,523,520,401	$ 1,605,719,641	$ 1,691,479,667	$ 1,780,940,147
SRA - Rusk							
Per Capita Income (disposable, locally spent)	$ 48,394	$ 49,846	$ 51,342	$ 52,882	$ 54,468	$ 56,102	$ 57,785
Assumed increase in population	13,333	13,666	14,000	14,333	14,666	15,000	15,333
Commerce from New Residents	$ 645,242,156	$ 681,214,406	$ 718,764,273	$ 757,954,040	$ 798,848,304	$ 841,514,066	$ 886,020,810
SRA - Wood							
Per Capita Income (disposable, locally spent)	$ 50,633	$ 52,152	$ 53,717	$ 55,328	$ 56,988	$ 58,698	$ 60,459
Assumed increase in population	8,838	9,059	9,280	9,501	9,722	9,943	10,164
Commerce from New Residents	447,496,939	472,444,894	498,486,978	525,666,387	554,027,922	583,618,050	614,484,960
Total Benefits	$ 2,389,703,735	$ 2,522,929,718	$ 2,661,998,527	$ 2,807,140,827	$ 2,958,595,867	$ 3,116,611,783	$ 3,281,445,917
Economic Development [(2)]							
<u>Upper Basin</u>							
Collin	$ 678,432.67	$ 693,678.15	$ 709,380.99	$ 725,554.91	$ 742,214.06	$ 759,372.98	$ 777,046.66
Rockwall	181,604	185,684	189,888	194,217	198,677	203,270	208,001
Hunt	943,637	964,842	986,683	1,009,179	1,032,351	1,056,217	1,080,800
Kaufman	55,391	56,635	57,917	59,238	60,598	61,999	63,442
Van Zandt	354,741	362,713	370,923	379,381	388,091	397,063	406,305
Rains	172,241	176,111	180,098	184,204	188,434	192,790	197,277
Hopkins	156,690	160,211	163,838	167,573	171,421	175,384	179,466
Wood	669,523	684,568	700,065	716,026	732,467	749,400	766,842
Smith	1,624,446	1,660,950	1,698,549	1,737,276	1,777,165	1,818,251	1,860,569
Franklin	7,928	8,106	8,290	8,479	8,673	8,874	9,080
Upshur	160,642	164,252	167,970	171,800	175,744	179,807	183,992
Gregg	1,963,628	2,007,754	2,053,204	2,100,017	2,148,234	2,197,898	2,249,052
Rusk	384,404	393,042	401,939	411,103	420,543	430,265	440,279
Harrison	473,139	483,771	494,722	506,002	517,620	529,587	541,912
Panola	373,501	381,895	390,540	399,444	408,615	418,062	427,792
Total Upper Basin Benefits	$ 8,199,946.53	$ 8,384,212.56	$ 8,574,006.57	$ 8,769,494.40	$ 8,970,846.87	$ 9,178,239.91	$ 9,391,854.75
<u>Lower Basin</u>							
Shelby	$ 336,343.63	$ 343,901.82	$ 351,686.75	$ 359,705.22	$ 367,964.25	$ 376,471.06	$ 385,233.06
San Augustine	10,887	11,132	11,384	11,643	11,910	12,186	12,469
Sabine	136,177	139,237	142,389	145,635	148,979	152,423	155,971
Jasper	326,143	333,472	341,020	348,796	356,804	365,053	373,549
Newton	216,974	221,850	226,872	232,044	237,372	242,860	248,512
Orange	789,649	807,394	825,671	844,496	863,886	883,858	904,429
Total Lower Basin Benefits	$ 1,816,172.65	$ 1,856,984.98	$ 1,899,021.68	$ 1,942,319.48	$ 1,986,916.22	$ 2,032,850.86	$ 2,080,163.53

(1) SRA Comprehensive Sabine Watershed Manageme

(2) It is assumed that the Maintenance and Interbasin T

ANNUAL CALCULATION - SRA

		2054		Total
Benefits to SRA				
Commerce from New Residents [(1)]				
SRA - Harrison				
Per Capita Income (disposable, locally spent)	$	77,080		
Assumed increase in population		24,315		
Commerce from New Residents	$	1,874,245,924	$	30,087,031,797
SRA - Rusk				
Per Capita Income (disposable, locally spent)	$	59,519		
Assumed increase in population		15,666		
Commerce from New Residents	$	932,440,596	$	14,968,350,461
SRA - Wood				
Per Capita Income (disposable, locally spent)	$	62,273		
Assumed increase in population		10,385		
Commerce from New Residents		646,678,629		
Total Benefits	$	3,453,365,149	$	55,436,432,161
Economic Development [(2)]				
Upper Basin				
Collin	$	795,250.56		25,424,272
Rockwall		212,873		6,805,594
Hunt		1,106,120		35,362,799
Kaufman		64,928		2,075,760
Van Zandt		415,823		13,293,926
Rains		201,899		6,454,730
Hopkins		183,670		5,871,966
Wood		784,807		25,090,375
Smith		1,904,156		60,876,146
Franklin		9,293		297,099
Upshur		188,302		6,020,052
Gregg		2,301,741		73,586,981
Rusk		450,593		14,405,533
Harrison		554,608		17,730,885
Panola		437,814		13,996,969
Total Upper Basin Benefits	$	9,611,878.02		307,293,086
Lower Basin				
Shelby	$	394,257.93		12,604,481
San Augustine		12,762		407,990
Sabine		159,624		5,103,217
Jasper		382,300		12,222,199
Newton		254,334		8,131,104
Orange		925,617		29,592,100
Total Lower Basin Benefits	$	2,128,895.59		68,061,090

(1) SRA Comprehensive Sabine Watershed Manageme
(2) It is assumed that the Maintenance and Interbasin T

PRESENT VALUE CALCULATION - SRA

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Benefits to SRA											
Commerce from New Residents											
SRA - Harrison											
Commerce from New Residents				$ 8,843,995	$ 17,351,076	$ 25,530,869	$ 33,392,755	$ 40,945,878	$ 48,199,148	$ 55,161,247	$ 61,840,636
SRA - Rusk											
Commerce from New Residents				4,399,903	8,632,190	12,701,651	16,612,954	20,370,645	23,979,160	27,442,816	30,765,824
SRA - Wood											
Commerce from New Residents				3,051,479	5,986,712	8,809,019	11,521,637	14,127,721	16,630,346	19,032,508	21,337,124
Total Benefits				$ 16,295,377	$ 31,969,978	$ 47,041,538	$ 61,527,345	$ 75,444,245	$ 88,808,654	$ 101,636,571	$ 113,943,584
Economic Development											
Upper Basin	$ 2,570,693	$ 2,515,347	$ 2,461,359	$ 2,408,689	$ 2,357,297	$ 3,217,773	$ 3,123,278	$ 3,035,644	$ 2,950,526	$ 2,864,555	$ 2,784,676
Lower Basin	569,372	557,114	545,156	533,491	522,108	712,691	691,762	672,352	653,500	634,459	616,767
Total Benefits	$ 3,140,066	$ 3,072,461	$ 3,006,516	$ 2,942,180	$ 2,879,406	$ 3,930,465	$ 3,815,040	$ 3,707,997	$ 3,604,026	$ 3,499,013	$ 3,401,443

PRESENT VALUE CALCULATION - SRA

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Benefits to SRA											
Commerce from New Residents											
SRA - Harrison											
Commerce from New Residents	$ 68,245,559	$ 74,384,049	$ 80,263,931	$ 85,892,830	$ 91,278,174	$ 96,427,199	$ 101,346,954	$ 106,044,305	$ 110,525,939	$ 114,798,371	$ 118,867,943
SRA - Rusk											
Commerce from New Residents	33,952,284	37,006,193	39,931,445	42,731,832	45,411,050	47,972,699	50,420,285	52,757,226	54,986,846	57,112,388	59,137,007
SRA - Wood											
Commerce from New Residents	23,547,041	25,665,028	27,693,788	29,635,949	31,494,076	33,270,665	34,968,148	36,588,894	38,135,211	39,609,345	41,013,486
Total Benefits	$ 125,744,884	$ 137,055,270	$ 147,889,163	$ 158,260,611	$ 168,183,300	$ 177,670,563	$ 186,735,388	$ 195,390,425	$ 203,647,996	$ 211,520,104	$ 219,018,436
Economic Development											
Upper Basin	$ 2,710,136	$ 2,634,534	$ 3,027,769	$ 2,923,965	$ 2,823,943	$ 2,725,791	$ 2,634,842	$ 2,545,400	$ 2,459,244	$ 2,377,725	$ 2,299,033
Lower Basin	600,257	583,512	670,608	647,617	625,464	603,724	583,580	563,770	544,688	526,633	509,203
Total Benefits	$ 3,310,393	$ 3,218,046	$ 3,698,377	$ 3,571,582	$ 3,449,407	$ 3,329,516	$ 3,218,423	$ 3,109,170	$ 3,003,932	$ 2,904,358	$ 2,808,237

PRESENT VALUE CALCULATION - SRA

	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Benefits to SRA											
Commerce from New Residents											
SRA - Harrison											
Commerce from New Residents	$ 122,740,833	$ 126,423,058	$ 129,920,476	$ 133,238,791	$ 136,383,558	$ 139,360,183	$ 142,173,931	$ 144,829,928	$ 147,333,161	$ 149,688,487	$ 151,900,632
SRA - Rusk											
Commerce from New Residents	61,063,777	62,895,690	64,635,662	66,286,529	67,851,056	69,331,932	70,731,777	72,053,140	73,298,503	74,470,282	75,570,828
SRA - Wood											
Commerce from New Residents	42,349,765	43,620,257	44,826,986	45,971,917	47,056,969	48,084,006	49,054,845	49,971,254	50,834,955	51,647,622	52,410,888
Total Benefits	$ 226,154,375	$ 232,939,006	$ 239,383,124	$ 245,497,238	$ 251,291,583	$ 256,776,121	$ 261,960,553	$ 266,854,322	$ 271,466,619	$ 275,806,391	$ 279,882,348
Economic Development											
Upper Basin	$ 2,223,083	$ 2,151,055	$ 2,081,400	$ 2,014,057	$ 1,948,964	$ 1,887,099	$ 1,827,197	$ 1,764,611	$ 1,472,894	$ 1,431,235	$ 1,391,018
Lower Basin	492,381	476,428	461,001	446,085	431,668	417,966	404,698	390,837	326,225	316,998	308,091
Total Benefits	$ 2,715,464	$ 2,627,483	$ 2,542,401	$ 2,460,143	$ 2,380,632	$ 2,305,065	$ 2,231,895	$ 2,155,448	$ 1,799,119	$ 1,748,234	$ 1,699,109

PRESENT VALUE CALCULATION - SRA

	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048
Benefits to SRA											
Commerce from New Residents											
SRA - Harrison											
Commerce from New Residents	$ 153,974,197	$ 155,913,656	$ 157,723,369	$ 159,407,572	$ 160,970,391	$ 162,415,840	$ 163,747,821	$ 164,970,135	$ 166,086,474	$ 167,100,433	$ 168,015,507
SRA - Rusk											
Commerce from New Residents	76,602,430	77,567,314	78,467,649	79,305,543	80,083,049	80,802,162	81,464,825	82,072,928	82,628,309	83,132,755	83,588,006
SRA - Wood											
Commerce from New Residents	53,126,338	53,795,518	54,419,930	55,001,037	55,540,263	56,038,992	56,498,571	56,920,311	57,305,486	57,655,336	57,971,068
Total Benefits	$ 283,702,964	$ 287,276,488	$ 290,610,948	$ 293,714,152	$ 296,593,703	$ 299,256,993	$ 301,711,217	$ 303,963,373	$ 306,020,268	$ 307,888,524	$ 309,574,580
Economic Development											
Upper Basin	$ 1,352,184	$ 1,314,677	$ 1,278,444	$ 1,243,434	$ 1,209,599	$ 1,176,891	$ 1,145,267	$ 1,114,683	$ 1,085,100	$ 1,056,478	$ 1,028,780
Lower Basin	299,490	291,182	283,157	275,403	267,909	260,665	253,660	246,887	240,334	233,995	227,860
Total Benefits	$ 1,651,674	$ 1,605,859	$ 1,561,601	$ 1,518,837	$ 1,477,508	$ 1,437,556	$ 1,398,927	$ 1,361,570	$ 1,325,435	$ 1,290,473	$ 1,256,640

PRESENT VALUE CALCULATION - SRA

	2049	2050	2051	2052	2053	2054	Total
Benefits to SRA							
Commerce from New Residents							
SRA - Harrison							
Commerce from New Residents	$ 168,835,094	$ 169,562,502	$ 170,200,943	$ 170,753,544	$ 171,223,342	$ 171,613,291	$ 5,665,848,006
SRA - Rusk							
Commerce from New Residents	83,995,752	84,357,639	84,675,264	84,950,184	85,183,909	85,377,910	2,818,769,202
SRA - Wood							
Commerce from New Residents	58,253,853	58,504,834	58,725,118	58,915,784	59,077,880	59,212,426	1,954,910,384
Total Benefits	$ 311,084,700	$ 312,424,974	$ 313,601,325	$ 314,619,511	$ 315,485,131	$ 316,203,627	$ 10,439,527,592
Economic Development							
Upper Basin	$ 1,001,970	$ 976,014	$ 950,880	$ 926,536	$ 902,953	$ 880,101	$ 90,741,428
Lower Basin	221,922	216,173	210,607	205,215	199,991	194,930	20,097,948
Total Benefits	$ 1,223,892	$ 1,192,187	$ 1,161,486	$ 1,131,751	$ 1,102,944	$ 1,075,031	$ 110,839,376

ANNUAL CALCULATION

	Income			Multiplier effect (ME)	Income per year w/ ME	Year of Value	First Year of Impact	Last Year of Impact
	per capita	disposable	locally spent					
Benefits to Receiving Basin								
Commerce from New Residents								
DWU								
Per Capita Income (disposable, locally spent)	$ 36,617	76.1%	70.2%	1.49	$ 29,154	2005		
Assumed increase in population (1)							2008	2054
Commerce from New Residents							2008	2054
NTMWD								
Per Capita Income (disposable, locally spent)	$ 39,941	78.1%	59.5%	1.39	$ 25,851	2000		
Assumed increase in population (2)							2008	2054
Commerce from New Residents							2008	2054
TRWD								
Per Capita Income (disposable, locally spent)	$ 31,054	80.9%	70.2%	1.55	$ 27,322	2000		
Assumed increase in population (3)							2008	2054
Commerce from New Residents							2008	2054
Total Benefits								

PRESENT VALUE CALCULATION

Benefits to Receiving Basin

Commerce from New Residents

Dallas (DWU)

Commerce from New Residents

Collin (NTMWD)

Commerce from New Residents

Tarrant (TRWD)

Commerce from New Residents

Total Benefits

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Notes:

(1) Freese & Nichols Technical Report, December 2003. Population increase projected until 2040

(2) Freese & Nichols Technical Report, December 2003. Population increase projected until 2038

(3) Freese & Nichols Technical Report, December 2003. Population increase projected until 2051

ANNUAL CALCULATION

	2008	2009	2010	2011	2012	2013	2014
Benefits to Receiving Basin							
Commerce from New Residents							
DWU							
Per Capita Income (disposable, locally spent)	$ 31,858	$ 32,813	$ 33,798	$ 34,812	$ 35,856	$ 36,932	$ 38,040
Assumed increase in population (1)	341,680	348,244	354,522	361,333	368,274	375,349	382,560
Commerce from New Residents	$ 10,885,116,239	$ 11,427,057,793	$ 11,982,050,360	$ 12,578,605,403	$ 13,204,861,366	$ 13,862,296,980	$ 14,552,464,600
NTMWD							
Per Capita Income (disposable, locally spent)	$ 32,747	$ 33,729	$ 34,741	$ 35,783	$ 36,857	$ 37,963	$ 39,102
Assumed increase in population (2)	276,506	283,851	287,307	294,938	302,773	310,815	319,071
Commerce from New Residents	$ 9,054,702,945	$ 9,574,078,346	$ 9,981,373,615	$ 10,553,902,604	$ 11,159,271,707	$ 11,799,364,624	$ 12,476,173,104
TRWD							
Per Capita Income (disposable, locally spent)	$ 34,610	$ 35,649	$ 36,718	$ 37,820	$ 38,954	$ 40,123	$ 41,326
Assumed increase in population (3)	338,800	345,259	341,330	347,838	354,470	361,228	368,115
Commerce from New Residents	$ 11,725,950,889	$ 12,307,997,578	$ 12,532,989,494	$ 13,155,095,548	$ 13,808,081,380	$ 14,493,479,785	$ 15,212,899,642
Total Benefits	$ 31,665,770,073	$ 33,309,133,717	$ 34,496,413,469	$ 36,287,603,554	$ 38,172,214,453	$ 40,155,141,389	$ 42,241,537,346

PRESENT VALUE CALCULATION

	2008	2009	2010	2011	2012	2013	2014
Benefits to Receiving Basin							
Commerce from New Residents							
Dallas (DWU)							
Commerce from New Residents	$ 9,402,972,672	$ 9,401,068,726	$ 9,388,249,985	$ 9,386,349,020	$ 9,384,448,440	$ 9,382,548,244	$ 9,380,648,434
Collin (NTMWD)							
Commerce from New Residents	7,821,792,847	7,876,617,949	7,820,667,404	7,875,484,618	7,930,686,060	7,986,274,424	8,042,252,423
Tarrant (TRWD)							
Commerce from New Residents	10,129,317,257	10,125,820,067	9,819,925,213	9,816,534,842	9,813,145,642	9,809,757,611	9,806,370,751
Total Benefits	$ 17,224,765,519	$ 17,277,686,675	$ 17,208,917,389	$ 17,261,833,637	$ 17,315,134,500	$ 17,368,822,669	$ 17,422,900,857

Notes:
(1) Freese & Nichols Technical Report, December 2003. P
(2) Freese & Nichols Technical Report, December 2003. P
(3) Freese & Nichols Technical Report, December 2003. P

ANNUAL CALCULATION

	2015	2016	2017	2018	2019	2020	2021
Benefits to Receiving Basin							
Commerce from New Residents							
DWU							
Per Capita Income (disposable, locally spent)	$ 39,181	$ 40,356	$ 41,567	$ 42,814	$ 44,098	$ 45,421	$ 46,784
Assumed increase in population (1)	389,909	397,400	405,035	412,816	420,746	437,550	445,956
Commerce from New Residents	$ 15,276,993,865	$ 16,037,595,554	$ 16,836,065,617	$ 17,674,289,422	$ 18,554,246,205	$ 19,874,115,092	$ 20,863,595,459
NTMWD							
Per Capita Income (disposable, locally spent)	$ 40,275	$ 41,483	$ 42,727	$ 44,009	$ 45,329	$ 46,689	$ 48,090
Assumed increase in population (2)	327,547	336,247	345,179	354,348	363,761	371,438	381,305
Commerce from New Residents	$ 13,191,803,142	$ 13,948,481,532	$ 14,748,562,797	$ 15,594,536,516	$ 16,489,035,067	$ 17,342,176,111	$ 18,336,918,813
TRWD							
Per Capita Income (disposable, locally spent)	$ 42,566	$ 43,843	$ 45,159	$ 46,513	$ 47,909	$ 49,346	$ 50,826
Assumed increase in population (3)	375,133	382,285	389,574	397,001	404,570	416,980	424,930
Commerce from New Residents	$ 15,968,029,690	$ 16,760,642,493	$ 17,592,598,601	$ 18,465,850,915	$ 19,382,449,277	$ 20,576,312,768	$ 21,597,669,144
Total Benefits	$ 44,436,826,697	$ 46,746,719,579	$ 49,177,227,015	$ 51,734,676,854	$ 54,425,730,549	$ 57,792,603,970	$ 60,798,183,416

PRESENT VALUE CALCULATION

	2015	2016	2017	2018	2019	2020	2021
Benefits to Receiving Basin							
Commerce from New Residents							
Dallas (DWU)							
Commerce from New Residents	$ 9,378,749,008	$ 9,376,849,967	$ 9,374,951,310	$ 9,373,053,038	$ 9,371,155,150	$ 9,559,789,169	$ 9,557,853,470
Collin (NTMWD)							
Commerce from New Residents	8,098,622,787	8,155,388,266	8,212,551,630	8,270,115,668	8,328,083,188	8,341,883,227	8,400,353,786
Tarrant (TRWD)							
Commerce from New Residents	9,802,985,060	9,799,600,538	9,796,217,184	9,792,834,998	9,789,453,980	9,897,558,257	9,894,141,083
Total Benefits	$ 17,477,371,795	$ 17,532,238,233	$ 17,587,502,940	$ 17,643,168,706	$ 17,699,238,338	$ 17,901,672,396	$ 17,958,207,256

Notes:
(1) Freese & Nichols Technical Report, December 2003. P
(2) Freese & Nichols Technical Report, December 2003. P
(3) Freese & Nichols Technical Report, December 2003. P

ANNUAL CALCULATION

	2022	2023	2024	2025	2026	2027	2028
Benefits to Receiving Basin							
Commerce from New Residents							
DWU							
Per Capita Income (disposable, locally spent)	$ 48,188	$ 49,633	$ 51,122	$ 52,656	$ 54,235	$ 55,863	$ 57,538
Assumed increase in population (1)	454,523	463,255	472,154	481,225	490,470	499,892	509,496
Commerce from New Residents	$ 21,902,339,473	$ 22,992,799,843	$ 24,137,551,391	$ 25,339,297,134	$ 26,600,874,664	$ 27,925,262,849	$ 29,315,588,869
NTMWD							
Per Capita Income (disposable, locally spent)	$ 49,533	$ 51,019	$ 52,549	$ 54,126	$ 55,749	$ 57,422	$ 59,145
Assumed increase in population (2)	391,433	401,831	412,505	423,462	434,710	446,258	458,111
Commerce from New Residents	$ 19,388,719,697	$ 20,500,851,606	$ 21,676,775,112	$ 22,920,149,283	$ 24,234,843,073	$ 25,624,947,356	$ 27,094,787,658
TRWD							
Per Capita Income (disposable, locally spent)	$ 52,351	$ 53,922	$ 55,539	$ 57,206	$ 58,922	$ 60,689	$ 62,510
Assumed increase in population (3)	433,032	441,288	449,701	458,275	467,012	475,916	484,990
Commerce from New Residents	$ 22,669,723,080	$ 23,794,991,074	$ 24,976,114,540	$ 26,215,866,002	$ 27,517,155,606	$ 28,883,037,951	$ 30,316,719,258
Total Benefits	$ 63,960,782,250	$ 67,288,642,524	$ 70,790,441,044	$ 74,475,312,420	$ 78,352,873,343	$ 82,433,248,156	$ 86,727,095,785

PRESENT VALUE CALCULATION

	2022	2023	2024	2025	2026	2027	2028
Benefits to Receiving Basin							
Commerce from New Residents							
Dallas (DWU)							
Commerce from New Residents	$ 9,555,918,163	$ 9,553,983,248	$ 9,552,048,725	$ 9,550,114,593	$ 9,548,180,853	$ 9,546,247,505	$ 9,544,314,548
Collin (NTMWD)							
Commerce from New Residents	8,459,234,181	8,518,527,285	8,578,235,990	8,638,363,211	8,698,911,879	8,759,884,950	8,821,285,398
Tarrant (TRWD)							
Commerce from New Residents	9,890,725,089	9,887,310,274	9,883,896,638	9,880,484,181	9,877,072,902	9,873,662,800	9,870,253,876
Total Benefits	$ 18,015,152,344	$ 18,072,510,533	$ 18,130,284,715	$ 18,188,477,804	$ 18,247,092,733	$ 18,306,132,455	$ 18,365,599,946

Notes:
(1) Freese & Nichols Technical Report, December 2003. P
(2) Freese & Nichols Technical Report, December 2003. P
(3) Freese & Nichols Technical Report, December 2003. P

ANNUAL CALCULATION

	2029	2030	2031	2032	2033	2034	2035
Benefits to Receiving Basin							
Commerce from New Residents							
DWU							
Per Capita Income (disposable, locally spent)	$ 59,265	$ 61,043	$ 62,874	$ 64,760	$ 66,703	$ 68,704	$ 70,765
Assumed increase in population (1)	519,284	540,167	550,544	561,121	571,901	582,887	594,085
Commerce from New Residents	$ 30,775,135,595	$ 32,973,161,216	$ 34,614,808,933	$ 36,338,190,008	$ 38,147,373,733	$ 40,046,631,999	$ 42,040,449,381
NTMWD							
Per Capita Income (disposable, locally spent)	$ 60,919	$ 62,746	$ 64,629	$ 66,568	$ 68,565	$ 70,622	$ 72,740
Assumed increase in population (2)	470,280	491,472	504,527	517,928	531,686	545,809	560,307
Commerce from New Residents	$ 28,648,937,617	$ 30,838,105,239	$ 32,606,970,919	$ 34,477,298,273	$ 36,454,907,117	$ 38,545,951,089	$ 40,756,936,798
TRWD							
Per Capita Income (disposable, locally spent)	$ 64,385	$ 66,317	$ 68,306	$ 70,356	$ 72,466	$ 74,640	$ 76,879
Assumed increase in population (3)	494,236	507,331	517,004	526,861	536,906	547,142	557,574
Commerce from New Residents	$ 31,821,564,896	$ 33,644,646,242	$ 35,314,681,799	$ 37,067,613,718	$ 38,907,556,765	$ 40,838,829,954	$ 42,865,966,684
Total Benefits	$ 91,245,638,108	$ 97,455,912,697	$ 102,536,461,650	$ 107,883,101,999	$ 113,509,837,615	$ 119,431,413,042	$ 125,663,352,862

PRESENT VALUE CALCULATION

	2029	2030	2031	2032	2033	2034	2035
Benefits to Receiving Basin							
Commerce from New Residents							
Dallas (DWU)							
Commerce from New Residents	$ 9,542,381,983	$ 9,737,065,899	$ 9,735,094,304	$ 9,733,123,109	$ 9,731,152,313	$ 9,729,181,916	$ 9,727,211,918
Collin (NTMWD)							
Commerce from New Residents	8,883,116,219	9,106,577,951	9,170,408,466	9,234,686,386	9,299,414,848	9,364,597,010	9,430,236,051
Tarrant (TRWD)							
Commerce from New Residents	9,866,846,129	9,935,357,288	9,931,927,064	9,928,498,024	9,925,070,168	9,921,643,495	9,918,218,005
Total Benefits	$ 18,425,498,202	$ 18,843,643,850	$ 18,905,502,770	$ 18,967,809,495	$ 19,030,567,161	$ 19,093,778,926	$ 19,157,447,969

Notes:
(1) Freese & Nichols Technical Report, December 2003. P
(2) Freese & Nichols Technical Report, December 2003. P
(3) Freese & Nichols Technical Report, December 2003. P

ANNUAL CALCULATION	2036	2037	2038	2039	2040	2041	2042
Benefits to Receiving Basin							
Commerce from New Residents							
DWU							
Per Capita Income (disposable, locally spent)	$ 72,888	$ 75,075	$ 77,327	$ 79,647	$ 82,036	$ 84,497	$ 87,032
Assumed increase in population (1)	605,498	617,130	628,986	641,070	663,402	663,402	663,402
Commerce from New Residents	$ 44,133,533,731	$ 46,330,827,293	$ 48,637,518,372	$ 51,059,053,585	$ 54,422,912,506	$ 56,055,599,881	$ 57,737,267,878
NTMWD							
Per Capita Income (disposable, locally spent)	$ 74,923	$ 77,170	$ 79,485	$ 81,870	$ 84,326	$ 86,856	$ 89,461
Assumed increase in population (2)	575,191	590,470	606,154	606,154	618,417	618,417	618,417
Commerce from New Residents	$ 43,094,744,071	$ 45,566,647,360	$ 48,180,338,378	$ 49,625,748,529	$ 52,148,587,214	$ 53,713,044,831	$ 55,324,436,176
TRWD							
Per Capita Income (disposable, locally spent)	$ 79,186	$ 81,561	$ 84,008	$ 86,528	$ 89,124	$ 91,798	$ 94,552
Assumed increase in population (3)	568,204	579,037	590,077	601,327	615,968	627,711	639,679
Commerce from New Residents	$ 44,993,725,378	$ 47,227,100,658	$ 49,571,335,066	$ 52,031,931,370	$ 54,897,720,948	$ 57,622,705,640	$ 60,482,951,714
Total Benefits	$ 132,222,003,180	$ 139,124,575,311	$ 146,389,191,816	$ 152,716,733,484	$ 161,469,220,668	$ 167,391,350,352	$ 173,544,655,767

PRESENT VALUE CALCULATION	2036	2037	2038	2039	2040	2041	2042
Benefits to Receiving Basin							
Commerce from New Residents							
Dallas (DWU)							
Commerce from New Residents	$ 9,725,242,319	$ 9,723,273,119	$ 9,721,304,317	$ 9,719,335,914	$ 9,866,345,338	$ 9,678,414,951	$ 9,494,064,190
Collin (NTMWD)							
Commerce from New Residents	9,496,335,175	9,562,897,605	9,629,926,590	9,446,499,417	9,454,032,257	9,273,955,452	9,097,308,681
Tarrant (TRWD)							
Commerce from New Residents	9,914,793,699	9,911,370,574	9,907,948,631	9,904,527,870	9,952,423,496	9,948,987,379	9,945,552,449
Total Benefits	$ 19,221,577,494	$ 19,286,170,724	$ 19,351,230,907	$ 19,165,835,331	$ 19,320,377,595	$ 18,952,370,402	$ 18,591,372,871

Notes:
(1) Freese & Nichols Technical Report, December 2003. P
(2) Freese & Nichols Technical Report, December 2003. P
(3) Freese & Nichols Technical Report, December 2003. P

ANNUAL CALCULATION	2043	2044	2045	2046	2047	2048	2049
Benefits to Receiving Basin							
Commerce from New Residents							
DWU							
Per Capita Income (disposable, locally spent)	$ 89,643	$ 92,332	$ 95,102	$ 97,955	$ 100,894	$ 103,921	$ 107,038
Assumed increase in population (1)	663,402	663,402	663,402	663,402	663,402	663,402	663,402
Commerce from New Residents	$ 59,469,385,914	$ 61,253,467,491	$ 63,091,071,516	$ 64,983,803,662	$ 66,933,317,771	$ 68,941,317,305	$ 71,009,556,824
NTMWD							
Per Capita Income (disposable, locally spent)	$ 92,145	$ 94,910	$ 97,757	$ 100,690	$ 103,710	$ 106,822	$ 110,026
Assumed increase in population (2)	618,417	618,417	618,417	618,417	618,417	618,417	618,417
Commerce from New Residents	$ 56,984,169,261	$ 58,693,694,339	$ 60,454,505,169	$ 62,268,140,324	$ 64,136,184,534	$ 66,060,270,070	$ 68,042,078,172
TRWD							
Per Capita Income (disposable, locally spent)	$ 97,389	$ 100,310	$ 103,320	$ 106,419	$ 109,612	$ 112,900	$ 116,287
Assumed increase in population (3)	651,875	664,303	676,968	689,875	703,028	716,432	730,091
Commerce from New Residents	$ 63,485,173,204	$ 66,636,417,413	$ 69,944,081,452	$ 73,415,929,609	$ 77,060,111,570	$ 80,885,181,551	$ 84,900,118,378
Total Benefits	$ 179,938,728,379	$ 186,583,579,242	$ 193,489,658,137	$ 200,667,873,594	$ 208,129,613,874	$ 215,886,768,925	$ 223,951,753,374

PRESENT VALUE CALCULATION	2043	2044	2045	2046	2047	2048	2049
Benefits to Receiving Basin							
Commerce from New Residents							
Dallas (DWU)							
Commerce from New Residents	$ 9,313,224,872	$ 9,135,830,112	$ 8,961,814,301	$ 8,791,113,076	$ 8,623,663,303	$ 8,459,403,050	$ 8,298,271,563
Collin (NTMWD)							
Commerce from New Residents	8,924,026,611	8,754,045,152	8,587,301,435	8,423,733,788	8,263,281,716	8,105,885,874	7,951,488,048
Tarrant (TRWD)							
Commerce from New Residents	9,942,118,705	9,938,686,146	9,935,254,773	9,931,824,584	9,928,395,579	9,924,967,758	9,921,541,121
Total Benefits	$ 18,237,251,483	$ 17,889,875,264	$ 17,549,115,735	$ 17,214,846,864	$ 16,886,945,019	$ 16,565,288,924	$ 16,249,759,611

Notes:
(1) Freese & Nichols Technical Report, December 2003. P
(2) Freese & Nichols Technical Report, December 2003. P
(3) Freese & Nichols Technical Report, December 2003. P

ANNUAL CALCULATION

	2050	2051	2052	2053	2054	Total
Benefits to Receiving Basin						
Commerce from New Residents						
DWU						
Per Capita Income (disposable, locally spent)	$ 110,250	$ 113,557	$ 116,964	$ 120,473	$ 124,087	
Assumed increase in population (1)	666,469	666,469	666,469	666,469	666,469	
Commerce from New Residents	$ 73,477,967,680	$ 75,682,306,711	$ 77,952,775,912	$ 80,291,359,189	$ 82,700,099,965	$ 1,850,921,962,227
NTMWD						
Per Capita Income (disposable, locally spent)	$ 113,327	$ 116,727	$ 120,229	$ 123,836	$ 127,551	
Assumed increase in population (2)	627,744	627,744	627,744	627,744	627,744	
Commerce from New Residents	$ 71,140,383,535	$ 73,274,595,041	$ 75,472,832,892	$ 77,737,017,879	$ 80,069,128,416	$ 1,750,007,107,946
TRWD						
Per Capita Income (disposable, locally spent)	$ 119,776	$ 123,369	$ 127,070	$ 130,882	$ 134,809	
Assumed increase in population (3)	743,338	757,510	757,510	757,510	757,510	
Commerce from New Residents	$ 89,033,856,465	$ 93,453,273,006	$ 96,256,871,196	$ 99,144,577,332	$ 102,118,914,652	$ 2,031,576,491,375
Total Benefits	$ 233,652,207,681	$ 242,410,174,758	$ 249,682,480,000	$ 257,172,954,400	$ 264,888,143,032	$ 5,632,505,561,549

PRESENT VALUE CALCULATION

	2050	2051	2052	2053	2054	Total
Benefits to Receiving Basin						
Commerce from New Residents						
Dallas (DWU)						
Commerce from New Residents	$ 8,177,841,285	$ 8,022,072,880	$ 7,869,271,491	$ 7,719,380,606	$ 7,572,344,785	$ 435,376,917,179
Collin (NTMWD)						
Commerce from New Residents	7,917,676,330	7,766,863,448	7,618,923,192	7,473,800,845	7,331,442,734	401,203,678,455
Tarrant (TRWD)						
Commerce from New Residents	9,909,157,400	9,905,736,221	9,717,055,531	9,531,968,759	9,350,407,450	464,107,346,540
Total Benefits	$ 16,095,517,615	$ 15,788,936,328	$ 15,488,194,683	$ 15,193,181,451	$ 14,903,787,519	$ 836,580,595,634

Notes:
(1) Freese & Nichols Technical Report, December 2003. P
(2) Freese & Nichols Technical Report, December 2003. P
(3) Freese & Nichols Technical Report, December 2003. P

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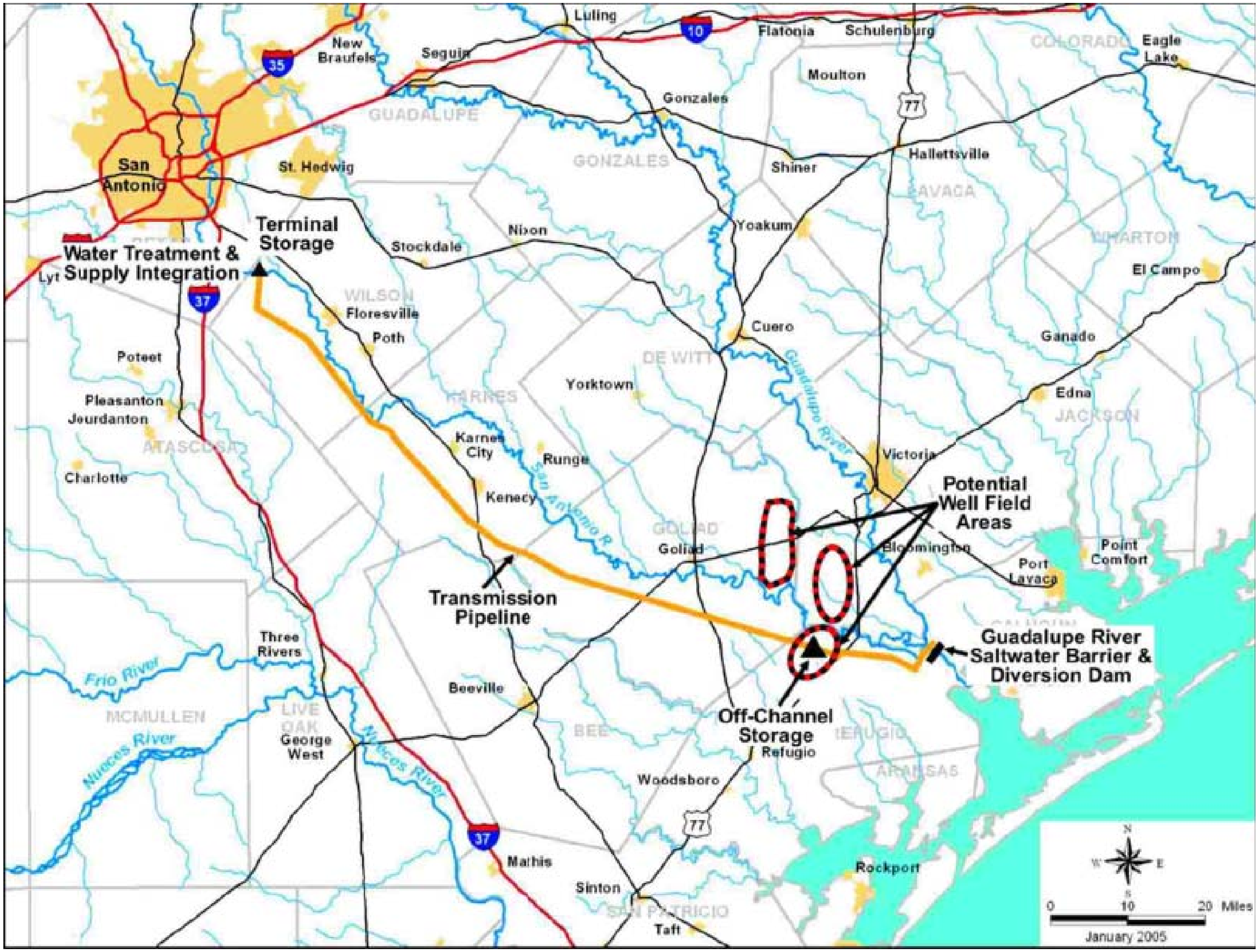
Appendix D, Figure 1
Lower Guadalupe Water Supply Project
Source: 2006 Region L Water Plan



Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfers in Texas
Comparison of Lower Guadalupe Water Supply Project (LGWSP) to Alternative Strategies

	Lower Guadalupe Water Supply Project							
	Inter-Basin		In-Basin Use		SAWS Gonzales-Carrizo Project		Seawater Desalination	
Total Project Cost (2005 Dollars)	**$**	**1,360,398,744**	**$**	**1,727,099,468**	**$**	**427,168,338**	**$**	**758,552,894**
Annual Cost (2005 Dollars)								
Operation and Maintenance	$	30,013,288	$	48,575,924	$	13,629,412	$	37,557,194
Debt Service		98,831,488		125,471,896		31,033,315		55,108,042
Water Cost		8,387,743		8,387,743		4,966,591		-
Total Annual Cost	**$**	**137,232,519**	**$**	**182,435,563**	**$**	**49,629,318**	**$**	**92,665,236**
PV (50 year life)	**$**	**973,316,866**	**$**	**1,327,061,223**	**$**	**1,190,387,503**	**$**	**1,811,932,992**
Acre Feet over 50 year life		**1,519,080**		**3,134,130**		**2,941,636**		**2,520,324**
PV Per Acre Foot	**$**	**641**	**$**	**423**	**$**	**405**	**$**	**719**

Texas Water Development Board
Socioeconomic Analysis of Selected Interbasin Transfer in Texas
Cost Escalation Lower Guadalupe Water Supply Project (Interbasin Transfer)

		2002		2005 (1)		2025 (1)
Capital Cost						
Off-Channel (2-25,000 acft reservoirs) and Terminal Storage (10,570 acre feet)	$	82,534,000	$	93,691,000		171,741,666
Intake and Pump Station at Guadalupe River (259 MGD)		17,461,000		19,821,389		36,333,889
Pipeline from Guadalupe River to Off-Channel Storage (120 in dia., 19 miles)		68,309,000		77,543,055		142,141,438
Intake and Pump Station at Off-Channel Storage (48 MGD)		16,709,000		18,967,733		34,769,083
Transmission Pipeline to Bexar County (54 in dia., 101 miles)		117,204,000		133,047,713		243,885,068
Transmission Pump Station(s)		14,250,000		16,176,324		29,652,249
Well Fields		40,397,000		45,857,893		84,060,485
Total Capital Cost	**$**	**356,864,000**	**$**	**405,105,107**	**$**	**742,583,880**
Non-Capital Cost (2)						
Engineering, Legal Costs and Contingencies	$	152,844,000	$	173,505,551	$	318,046,904
Environmental & Archaeology Studies and Mitigation		8,274,000		9,392,485		17,217,032
Study Period Costs		8,771,000		9,956,669		18,251,220
Land Acquisition and Surveying (4,118 acres)		43,533,000		49,417,819		90,586,061
Interest During Constraction (4 years)		83,481,676		94,766,783		173,713,647
Total	**$**	**296,903,676**	**$**	**337,039,308**	**$**	**617,814,865**
Total Project Cost	**$**	**653,767,676**	**$**	**742,144,415**	**$**	**1,360,398,744**
Annual Costs (3)						
Debt Service (4)	$	47,495,510	$	53,915,984	$	98,831,488
O&M - Intake, Pipeline, Pump Station		4,067,000		4,444,121		8,026,576
O&M - Dam and Reservoir		1,238,000		1,352,796		2,443,300
Energy Costs (5)		7,153,000		7,986,409		19,543,412
Purchase of Water		4,250,000		4,644,090		8,387,743
Total Annual Cost	**$**	**64,203,510**	**$**	**72,343,399**	**$**	**137,232,519**

Notes:
(1) All costs are inflated based upon factors contained in the Construction Cost Index History by ENR (Engineering News-Record) unless otherwise noted
(2) Non-Capital cost are esculated based the allocation percentage used in 2002
(3) Annual costs are esculated by a 3% inflation factor unless otherwise noted
(4) Debt Service includes Reservoir Debt and assumes a 30 year note at 6%
(5) Cost escalated using the Producer Price Industrial Electric Power Index; 2002 cost estimated at $0.06 kwh per Exhibit B of the TWDB planning guidelines

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Present Value Calculation of Lower Guadalupe Water Supply Project (Interbasin Transfer)

		Operations and Maintenance			Source Cost		
Year	Debt Service	Intake, Pipeline, Pump Station (1)	Dam & Reservoir (1)	Energy (2)	Puchase of Water (1)	Total	PV (3)
2005	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2006	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-
2014	-	-	-	-	-	-	-
2015	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-
2017	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-
2019	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-
2021	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-
2025	98,831,488	8,026,576	2,443,300	19,543,412	8,387,743	137,232,519	51,721,493
2026	98,831,488	8,267,374	2,516,599	20,437,738	8,639,375	138,692,574	49,782,640
2027	98,831,488	8,515,395	2,592,097	21,372,989	8,898,556	140,210,526	47,930,950
2028	98,831,488	8,770,857	2,669,860	22,351,039	9,165,513	141,788,756	46,162,351
2029	98,831,488	9,033,982	2,749,956	23,373,845	9,440,478	143,429,749	44,472,963
2030	98,831,488	9,305,002	2,832,454	24,443,455	9,723,693	145,136,092	42,859,090
2031	98,831,488	9,584,152	2,917,428	25,562,012	10,015,403	146,910,484	41,317,212
2032	98,831,488	9,871,676	3,004,951	26,731,756	10,315,866	148,755,737	39,843,974
2033	98,831,488	10,167,827	3,095,099	27,955,028	10,625,341	150,674,783	38,436,179
2034	98,831,488	10,472,862	3,187,952	29,234,278	10,944,102	152,670,681	37,090,780
2035	98,831,488	10,787,047	3,283,591	30,572,068	11,272,425	154,746,619	35,804,878
2036	98,831,488	11,110,659	3,382,099	31,971,076	11,610,598	156,905,919	34,575,706
2037	98,831,488	11,443,979	3,483,562	33,434,105	11,958,915	159,152,048	33,400,630
2038	98,831,488	11,787,298	3,588,069	34,964,083	12,317,683	161,488,620	32,277,141
2039	98,831,488	12,140,917	3,695,711	36,564,074	12,687,213	163,919,403	31,202,845
2040	98,831,488	12,505,144	3,806,582	38,237,283	13,067,830	166,448,327	30,175,465
2041	98,831,488	12,880,299	3,920,779	39,987,059	13,459,865	169,079,490	29,192,828
2042	98,831,488	13,266,708	4,038,403	41,816,907	13,863,661	171,817,166	28,252,864
2043	98,831,488	13,664,709	4,159,555	43,730,491	14,279,570	174,665,813	27,353,603
2044	98,831,488	14,074,650	4,284,342	45,731,642	14,707,958	177,630,079	26,493,165
2045	98,831,488	14,496,890	4,412,872	47,824,367	15,149,196	180,714,813	25,669,759
2046	98,831,488	14,931,796	4,545,258	50,012,858	15,603,672	183,925,073	24,881,679
2047	98,831,488	15,379,750	4,681,616	52,301,497	16,071,782	187,266,133	24,127,298
2048	98,831,488	15,841,143	4,822,064	54,694,866	16,553,936	190,743,497	23,405,067
2049	98,831,488	16,316,377	4,966,726	57,197,758	17,050,554	194,362,903	22,713,508
2050	98,831,488	16,805,868	5,115,728	59,815,184	17,562,070	198,130,339	22,051,215
2051	98,831,488	17,310,044	5,269,200	62,552,387	18,088,933	202,052,052	21,416,846
2052	98,831,488	17,829,346	5,427,276	65,414,847	18,631,601	206,134,557	20,809,122
2053	98,831,488	18,364,226	5,590,094	68,408,296	19,190,549	210,384,653	20,226,824
2054	98,831,488	18,915,153	5,757,797	71,538,728	19,766,265	214,809,431	19,668,792
Total							$ 973,316,866

Notes:
(1) Inflated by General Inflation
(2) Inflated by the Industrial Electric Power index
(3) PV calculation represents mid-year cost

Acre Feet/year	50,636
Years	30
Total Acre Feet	1,519,080
PV/ acre foot	**$ 640.73**

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Present Value Calculation of Lower Guadalupe Water Supply Project (In-basinTransfer)

	2002	2005 (1)	2025 (1)
Capital Cost			
Off-Channel (2-25,000 acft reservoirs) and Terminal Storage (10,570 acre feet)	$ 82,534,000	$ 93,691,000	$ 171,741,666
Intake and Pump Station at Guadalupe River (259 MGD)	17,461,000	19,821,389	36,333,889
Pipeline from Guadalupe River to Off-Channel Storage (120 in dia., 19 miles)	68,309,000	77,543,055	142,141,438
Intake and Pump Station at Off-Channel Storage (98 MGD)	25,975,000	29,486,317	54,050,328
Transmission Pipeline to Bexar County (78 in dia., 101 miles)	200,453,000	227,550,367	417,114,549
Transmission Pump Station(s)	20,343,000	23,092,980	42,330,927
Well Fields	40,397,000	45,857,893	84,060,485
Total Capital Cost	**$ 455,472,000**	**$ 517,043,001**	**$ 947,773,283**
Non-Capital Cost (2)			
Engineering, Legal Costs and Contingencies	$ 210,091,000	$ 238,491,238	$ 437,169,874
Environmental & Archaeology Studies and Mitigation	8,283,000	9,402,701	17,235,760
Study Period Costs	8,771,000	9,956,669	18,251,220
Land Acquisition and Surveying (4,118 acres)	43,543,000	49,429,171	90,606,870
Interest During Constraction (4 years)	103,833,273	117,869,522	216,062,462
Total	**$ 374,521,273**	**$ 425,149,301**	**$ 779,326,185**
Total Project Cost	**$ 829,993,273**	**$ 942,192,302**	**$ 1,727,099,468**
Annual Costs (3)			
Debt Service (4)	$ 60,298,108	$ 68,449,245	$ 125,471,896
O&M - Intake, Pipeline, Pump Station	5,684,000	6,211,060	11,217,866
O&M - Dam and Reservoir	1,238,000	1,352,796	2,443,300
Energy Costs (5)	12,779,000	14,267,904	34,914,758
Purchase of Water	4,250,000	4,644,090	8,387,743
Total Annual Cost	**$ 84,249,108**	**$ 94,925,095**	**$ 182,435,563**

Notes:

(1) All costs are inflated based upon factors contained in the Construction Cost Index History by ENR (Engineering News-Record) unless otherwise noted
(2) Non-Capital cost are esculated based the allocation percentage used in 2002
(3) Annual costs are esculated by a 3% inflation factor unless otherwise noted
(4) Debt Service includes Reservoir Debt and assumes a 30 year note at 6%
(5) Cost escalated using the Producer Price Industrial Electric Power Index; 2002 cost estimated at $0.06 kwh per Exhibit B of the TWDB planning guidelines

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Present Value Calculation of Lower Guadalupe Water Supply Project (In-basin Transfer)

		Operations and Maintenance			Source Cost		
Year	Debt Service	Intake, Pipeline, Pump Station [1]	Dam & Reservoir [1]	Energy [2]	Puchase of Water [1]	Total	PV [3]
2005	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2006	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-
2014	-	-	-	-	-	-	-
2015	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-
2017	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-
2019	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-
2021	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-
2025	125,471,896	11,217,866	2,443,300	34,914,758	8,387,743	182,435,563	68,758,045
2026	125,471,896	11,554,402	2,516,599	36,512,492	8,639,375	184,694,764	66,294,775
2027	125,471,896	11,901,034	2,592,097	38,183,340	8,898,556	187,046,924	63,941,967
2028	125,471,896	12,258,065	2,669,860	39,930,648	9,165,513	189,495,982	61,694,454
2029	125,471,896	12,625,807	2,749,956	41,757,915	9,440,478	192,046,052	59,547,318
2030	125,471,896	13,004,581	2,832,454	43,668,799	9,723,693	194,701,423	57,495,870
2031	125,471,896	13,394,718	2,917,428	45,667,127	10,015,403	197,466,573	55,535,644
2032	125,471,896	13,796,560	3,004,951	47,756,900	10,315,866	200,346,173	53,662,386
2033	125,471,896	14,210,457	3,095,099	49,942,304	10,625,341	203,345,098	51,872,041
2034	125,471,896	14,636,770	3,187,952	52,227,714	10,944,102	206,468,435	50,160,747
2035	125,471,896	15,075,873	3,283,591	54,617,706	11,272,425	209,721,492	48,524,824
2036	125,471,896	15,528,150	3,382,099	57,117,067	11,610,598	213,109,809	46,960,766
2037	125,471,896	15,993,994	3,483,562	59,730,801	11,958,915	216,639,169	45,465,232
2038	125,471,896	16,473,814	3,588,069	62,464,143	12,317,683	220,315,604	44,035,039
2039	125,471,896	16,968,028	3,695,711	65,322,564	12,687,213	224,145,413	42,667,155
2040	125,471,896	17,477,069	3,806,582	68,311,790	13,067,830	228,135,168	41,358,690
2041	125,471,896	18,001,381	3,920,779	71,437,806	13,459,865	232,291,728	40,106,889
2042	125,471,896	18,541,423	4,038,403	74,706,872	13,863,661	236,622,255	38,909,130
2043	125,471,896	19,097,665	4,159,555	78,125,533	14,279,570	241,134,221	37,762,913
2044	125,471,896	19,670,595	4,284,342	81,700,636	14,707,958	245,835,427	36,665,854
2045	125,471,896	20,260,713	4,412,872	85,439,339	15,149,196	250,734,017	35,615,684
2046	125,471,896	20,868,535	4,545,258	89,349,129	15,603,672	255,838,490	34,610,241
2047	125,471,896	21,494,591	4,681,616	93,437,834	16,071,782	261,157,720	33,647,462
2048	125,471,896	22,139,428	4,822,064	97,713,643	16,553,936	266,700,968	32,725,383
2049	125,471,896	22,803,611	4,966,726	102,185,118	17,050,554	272,477,905	31,842,132
2050	125,471,896	23,487,720	5,115,728	106,861,211	17,562,070	278,498,625	30,995,925
2051	125,471,896	24,192,351	5,269,200	111,751,287	18,088,933	284,773,667	30,185,062
2052	125,471,896	24,918,122	5,427,276	116,865,138	18,631,601	291,314,032	29,407,923
2053	125,471,896	25,665,665	5,590,094	122,213,004	19,190,549	298,131,208	28,662,963
2054	125,471,896	26,435,635	5,757,797	127,805,593	19,766,265	305,237,187	27,948,711
Total							$ 1,327,061,223

Notes:
(1) Inflated by General Inflation
(2) Inflated by the Industrial Electric Power index
(3) PV calculation represents mid-year cost

Acre Feet/year	104,471
Years	30
Total Acre Feet	3,134,130
PV/ acre foot	**$ 423.42**

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Cost Escalation of SAWS Gonzales - Carrizo Project

	2002	2005 (1)	2008 (1)
Capital Costs			
Wells	$ 39,992,000	$ 45,398,145	$ 49,718,129
Well Field Piping	25,514,000	28,962,999	31,719,052
Pipeline	95,208,000	108,078,279	118,362,762
Pump Station	14,831,000	16,835,864	18,437,927
SCADA and Telemetry (Supply)	2,138,000	2,427,016	2,657,966
Electric Power Infrastructure Improvements (Supply)	2,672,000	3,033,203	3,321,835
Contingency and Inflation (Supply) (18%) (2)	36,279,540	41,183,832	45,102,791
Total Capital Costs	**$ 216,634,540**	**$ 245,919,338**	**$ 269,320,462**
Non-Capital Costs (3)			
Engineering, Legal, and Program Management (19%)	$ 41,160,563	$ 46,724,674	$ 51,170,888
Environmental & Archaeology Studies, Mitigation, and Permitting	4,877,000	5,536,276	6,063,095
Land Acquisition and Surveying	9,731,000	11,046,443	12,097,597
Groundwater Lease Acquisition	6,176,000	7,010,876	7,678,015
Interest During Construction	39,064,260	44,344,992	48,564,761
Mitigation Reserve for Possible Impacts to Local Wells	12,002,000	13,624,438	14,920,909
Test Drilling Programs and Concept Studies	13,958,000	15,844,852	17,352,611
Total Non-Capital Costs	**$ 126,968,823**	**$ 144,132,551**	**$ 157,847,876**
Total Project Cost	**$ 343,603,363**	**$ 390,051,888**	**$ 427,168,338**
Annual Costs (4)			
Debt Service (5)	$ 24,962,410	$ 28,336,845	$ 31,033,315
Groundwater Leases	3,532,000	4,009,458	4,390,989
District Export Fee	463,000	525,589	575,602
Maintenance - Pipelines, Tanks, Wells	2,092,000	2,374,798	2,600,778
Maintenance - Pump Stations, SCADA	759,000	861,602	943,590
Power (Pumping) (6)	7,898,000	8,818,210	10,085,043
Total Annual Cost	**$ 39,706,410**	**$ 44,926,502**	**$ 49,629,318**

Notes:
(1) All costs are inflated based upon factors contained in the Construction Cost Index History by ENR (Engineering News-Record) unless otherwise noted
(2) Calculated at 18% of all capital costs excluding integration/Distribution
(3) Non-Capital cost are escalated based the allocation percentage used in 2002
(4) Annual costs are escalated by a 3% inflation factor unless otherwise noted
(5) Debt Service on Total Project Cost assumed at 6% interest for 30 years
(6) Cost escalated using the Producer Price Industrial Electric Power Index; 2002 cost estimated at $0.06 kwh per Exhibit B of the TWDB planning guidelines

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Present Value Calculation of SAWS Gonzales - Carrizo Project

		Operations and Maintenance							
Year	Debt Service	Pipelines, Tanks, Wells (1)	Pump Stations, SCADA(1)	Water Treatment (2)	Power (3)	Groundwater Leases (1)	Direct Export Fee (1)	Total	PV (4)
2005	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2006	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-
2008	31,033,315	2,600,778	943,590	4,676,752	10,085,043	4,390,989	575,602	54,306,070	46,911,625
2009	31,033,315	2,678,802	971,898	4,864,902	10,546,545	4,522,719	592,871	55,211,051	45,422,268
2010	31,033,315	2,759,166	1,001,055	5,060,622	11,029,166	4,658,400	610,657	56,152,380	43,996,859
2011	31,033,315	2,841,941	1,031,086	5,264,215	11,533,871	4,798,152	628,976	57,131,557	42,632,447
2012	31,033,315	2,927,199	1,062,019	5,475,999	12,061,673	4,942,097	647,846	58,150,147	41,326,224
2013	31,033,315	3,015,015	1,093,880	5,696,304	12,613,627	5,090,360	667,281	59,209,781	40,075,510
2014	31,033,315	3,105,465	1,126,696	5,925,471	13,190,839	5,243,070	687,299	60,312,157	38,877,754
2015	31,033,315	3,198,629	1,160,497	6,163,858	13,794,465	5,400,363	707,918	61,459,046	37,730,523
2016	31,033,315	3,294,588	1,195,312	6,411,836	14,425,714	5,562,373	729,156	62,652,294	36,631,499
2017	31,033,315	3,393,426	1,231,171	6,669,790	15,085,849	5,729,245	751,031	63,893,826	35,578,473
2018	31,033,315	3,495,229	1,268,106	6,938,122	15,776,192	5,901,122	773,562	65,185,647	34,569,341
2019	31,033,315	3,600,085	1,306,150	7,217,249	16,498,127	6,078,156	796,768	66,529,849	33,602,095
2020	31,033,315	3,708,088	1,345,334	7,507,605	17,253,098	6,260,500	820,671	67,928,611	32,674,824
2021	31,033,315	3,819,331	1,385,694	7,809,643	18,042,617	6,448,315	845,292	69,384,206	31,785,704
2022	31,033,315	3,933,911	1,427,265	8,123,832	18,868,265	6,641,765	870,650	70,899,002	30,933,000
2023	31,033,315	4,051,928	1,470,083	8,450,661	19,731,696	6,841,018	896,770	72,475,470	30,115,055
2024	31,033,315	4,173,486	1,514,185	8,790,639	20,634,638	7,046,248	923,673	74,116,184	29,330,291
2025	31,033,315	4,298,690	1,559,611	9,144,295	21,578,899	7,257,636	951,383	75,823,829	28,577,204
2026	31,033,315	4,427,651	1,606,399	9,512,178	22,566,372	7,475,365	979,925	77,601,204	27,854,360
2027	31,033,315	4,560,480	1,654,591	9,894,861	23,599,031	7,699,626	1,009,322	79,451,227	27,160,392
2028	31,033,315	4,697,295	1,704,229	10,292,941	24,678,947	7,930,614	1,039,602	81,376,942	26,493,997
2029	31,033,315	4,838,214	1,755,356	10,707,035	25,808,280	8,168,533	1,070,790	83,381,522	25,853,934
2030	31,033,315	4,983,360	1,808,016	11,137,789	26,989,293	8,413,589	1,102,914	85,468,276	25,239,019
2031	31,033,315	5,132,861	1,862,257	11,585,872	28,224,350	8,665,997	1,136,001	87,640,653	24,648,122
2032	31,033,315	5,286,847	1,918,125	12,051,983	29,515,924	8,925,976	1,170,081	89,902,251	24,080,167
2033	31,033,315	5,445,452	1,975,668	12,536,845	30,866,603	9,193,756	1,205,184	92,256,822	23,534,128
2034	31,033,315	5,608,816	2,034,938	13,041,213	32,279,089	9,469,568	1,241,339	94,708,279	23,009,028
2035	31,033,315	5,777,080	2,095,987	13,565,873	33,756,213	9,753,655	1,278,579	97,260,703	22,503,933
2036	31,033,315	5,950,393	2,158,866	14,111,641	35,300,931	10,046,265	1,316,937	99,918,347	22,017,955
2037	31,033,315	6,128,904	2,223,632	14,679,365	36,916,337	10,347,653	1,356,445	102,685,651	21,550,244
2038	-	6,312,772	2,290,341	15,269,929	38,605,665	10,658,083	1,397,138	74,533,928	14,897,286
2039	-	6,502,155	2,359,051	15,884,252	40,372,299	10,977,825	1,439,052	77,534,635	14,759,090
2040	-	6,697,219	2,429,823	16,523,290	42,219,776	11,307,160	1,482,224	80,659,493	14,622,782
2041	-	6,898,136	2,502,718	17,188,037	44,151,796	11,646,375	1,526,691	83,913,752	14,488,331
2042	-	7,105,080	2,577,799	17,879,528	46,172,226	11,995,766	1,572,491	87,302,890	14,355,706
2043	-	7,318,232	2,655,133	18,598,837	48,285,113	12,355,639	1,619,666	90,832,621	14,224,876
2044	-	7,537,779	2,734,787	19,347,086	50,494,688	12,726,308	1,668,256	94,508,905	14,095,811
2045	-	7,763,913	2,816,831	20,125,436	52,805,376	13,108,097	1,718,304	98,337,957	13,968,482
2046	-	7,996,830	2,901,336	20,935,101	55,221,803	13,501,340	1,769,853	102,326,263	13,842,861
2047	-	8,236,735	2,988,376	21,777,339	57,748,808	13,906,380	1,822,949	106,480,587	13,718,918
2048	-	8,483,837	3,078,027	22,653,461	60,391,451	14,323,572	1,877,637	110,807,986	13,596,628
2049	-	8,738,352	3,170,368	23,564,831	63,155,025	14,753,279	1,933,966	115,315,820	13,475,961
2050	-	9,000,503	3,265,479	24,512,866	66,045,062	15,195,877	1,991,985	120,011,771	13,356,891
2051	-	9,270,518	3,363,443	25,499,040	69,067,350	15,651,754	2,051,745	124,903,850	13,239,393
2052	-	9,548,633	3,464,346	26,524,890	72,227,941	16,121,306	2,113,297	130,000,414	13,123,440
2053	-	9,835,092	3,568,277	27,592,011	75,533,164	16,604,946	2,176,696	135,310,185	13,009,007
2054	-	10,130,145	3,675,325	28,702,062	78,989,637	17,103,094	2,241,997	140,842,261	12,896,069
Total									$ 1,190,387,503

Notes
(1) Inflated by General Inflation
(2) Water Treatment cost escalated using the Handy-Whitman NARUC - account 320
(3) Escalated using Producer Price Index, Industrial Electrical Power
(4) Half year convention applied to PV calculation

Acre Feet/year	62,588
Years	47
Total Acre Feet	2,941,636
PV/ acre foot	**$ 404.67**

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Cost Escalation of Desalinated Seawater

	2002	2005 (1)	2010 (1)
Capital Costs			
(2) Water Treatment Plant (Pretreatment and Desal) (2)	$ 129,272,000	$ 138,786,944	$ 169,043,077
Concentrate Disposal	43,279,000	49,129,483	57,165,848
Transmission Pump Stations	23,524,000	26,703,990	31,072,100
Transmission Pipeline	169,196,000	192,068,025	223,485,587
Total Capital Cost	**$ 365,271,000**	**$ 406,688,442**	**$ 480,766,611**
Non-Capital Cost (3)			
(4) Engineering, Legal, and Contingencies (4)	$ 142,607,550	$ 159,099,286	$ 187,767,892
Environmental & Archaeology Studies, Mitigation, and Permitting	11,559,000	12,869,655	15,213,858
Land Acquisition and Surveying (673 acres)	6,693,000	7,451,908	8,809,270
Interest During Construction (2.5 years)	50,141,076	55,826,486	65,995,262
Total Non-Capital Cost	**$ 211,000,626**	**$ 235,247,334**	**$ 277,786,283**
Total Project Cost	**$ 576,271,626**	**$ 641,935,776**	**$ 758,552,894**
Annual Costs			
Debt Service (5)	$ 41,865,506	$ 46,635,935	$ 55,108,042
O&M Pipeline, Pump Stations, Tank, Distribution (6)	3,437,000	3,901,616	4,539,823
Water Treatment Plants Excluding Electricity (2)	13,481,000	14,473,256	17,628,487
WTP Energy Cost (7)	6,413,000	7,160,190	8,955,437
Finished Water Pumping Energy Cost (7)	4,607,000	5,143,770	6,433,447
Total Annual Cost	**$ 69,803,506**	**$ 77,314,768**	**$ 92,665,236**

Notes:
(1) All costs are inflated based upon factors contained in the Construction Cost Index History by ENR (Engineering News-Record) unless otherwise noted
(2) Water Treatment cost escalated using the Handy-Whitman NARUC - account 320
(3) Non-Capital cost are esculated based the allocation percentage used in 2002 unless otherwise noted
(4) Calculated utilizing engineering, legal, and contingency percentages provided in Exhibit B of the TWDB planning guidelines
(5) Debt Service on Total Project Cost assumed at 6% interest for 30 years
(6) Calculated utilizing the same percentage of O&M as that which was used in 2002
(7) Cost escalated using the Producer Price Industrial Electric Power Index; 2002 cost estimated at $0.06 kwh per Exhibit B of the TWDB planning guidelines

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Present Value Calculation of Desalinated Seawater

		Operations and Maintenance				
Year	Debt Service	Pipeline, PS, Tank, Dist. (1)	Water Treatment Plant (2)	Power (3)	Total	PV (4)
2005	$ -	$ -	$ -	$ -	$ -	$ -
2006	-	-	-	-	-	-
2007	-	-	-	-	-	-
2008	-	-	-	-	-	-
2009	-	-	-	-	-	-
2010	55,108,042	4,539,823	17,628,487	15,388,884	92,665,236	72,605,637
2011	55,108,042	4,676,018	18,337,697	16,093,095	94,214,851	70,304,573
2012	55,108,042	4,816,299	19,075,439	16,829,531	95,829,310	68,104,102
2013	55,108,042	4,960,788	19,842,861	17,599,667	97,511,358	65,999,525
2014	55,108,042	5,109,611	20,641,158	18,405,045	99,263,856	63,986,367
2015	55,108,042	5,262,900	21,471,570	19,247,279	101,089,790	62,060,362
2016	55,108,042	5,420,787	22,335,391	20,128,053	102,992,273	60,217,449
2017	55,108,042	5,583,410	23,233,964	21,049,133	104,974,550	58,453,757
2018	55,108,042	5,750,912	24,168,688	22,012,363	107,040,005	56,765,600
2019	55,108,042	5,923,440	25,141,016	23,019,670	109,192,168	55,149,465
2020	55,108,042	6,101,143	26,152,462	24,073,074	111,434,721	53,602,006
2021	55,108,042	6,284,177	27,204,599	25,174,682	113,771,500	52,120,035
2022	55,108,042	6,472,703	28,299,065	26,326,700	116,206,510	50,700,515
2023	55,108,042	6,666,884	29,437,562	27,531,437	118,743,925	49,340,553
2024	55,108,042	6,866,890	30,621,862	28,791,303	121,388,097	48,037,392
2025	55,108,042	7,072,897	31,853,808	30,108,821	124,143,568	46,788,405
2026	55,108,042	7,285,084	33,135,315	31,486,631	127,015,073	45,591,090
2027	55,108,042	7,503,636	34,468,379	32,927,491	130,007,549	44,443,064
2028	55,108,042	7,728,745	35,855,074	34,434,286	133,126,147	43,342,054
2029	55,108,042	7,960,608	37,297,556	36,010,034	136,376,239	42,285,896
2030	55,108,042	8,199,426	38,798,070	37,657,889	139,763,427	41,272,527
2031	55,108,042	8,445,409	40,358,952	39,381,152	143,293,555	40,299,985
2032	55,108,042	8,698,771	41,982,630	41,183,272	146,972,715	39,366,395
2033	55,108,042	8,959,734	43,671,629	43,067,860	150,807,266	38,469,974
2034	55,108,042	9,228,526	45,428,578	45,038,689	154,803,836	37,609,022
2035	55,108,042	9,505,382	47,256,212	47,099,704	158,969,340	36,781,920
2036	55,108,042	9,790,544	49,157,372	49,255,034	163,310,992	35,987,124
2037	55,108,042	10,084,260	51,135,018	51,508,994	167,836,313	35,223,164
2038	55,108,042	10,386,788	53,192,226	53,866,097	172,553,153	34,488,637
2039	55,108,042	10,698,391	55,332,198	56,331,063	177,469,695	33,782,208
2040	-	11,019,343	57,558,263	58,908,829	127,486,435	23,112,052
2041	-	11,349,923	59,873,884	61,604,556	132,828,364	22,933,802
2042	-	11,690,421	62,282,665	64,423,643	138,396,729	22,757,354
2043	-	12,041,134	64,788,353	67,371,733	144,201,220	22,582,685
2044	-	12,402,368	67,394,848	70,454,731	150,251,947	22,409,772
2045	-	12,774,439	70,106,204	73,678,810	156,559,453	22,238,594
2046	-	13,157,672	72,926,640	77,050,426	163,134,739	22,069,129
2047	-	13,552,402	75,860,545	80,576,331	169,989,279	21,901,354
2048	-	13,958,974	78,912,484	84,263,585	177,135,043	21,735,249
2049	-	14,377,743	82,087,205	88,119,571	184,584,520	21,570,793
2050	-	14,809,076	85,389,649	92,152,011	192,350,735	21,407,965
2051	-	15,253,348	88,824,952	96,368,979	200,447,279	21,246,745
2052	-	15,710,948	92,398,461	100,778,920	208,888,329	21,087,113
2053	-	16,182,277	96,115,735	105,390,665	217,688,676	20,929,048
2054	-	16,667,745	99,982,558	110,213,447	226,863,751	20,772,533
Total						$ 1,811,932,992

Notes:
(1) Inflated by General Inflation
(2) Water Treatment cost escalated using the Handy-Whitman NARUC - account 320
(3) Escalated using Producer Price Index, Industrial Electrical Power
(4) Half year convention applied to PV calculation

Acre Feet/year	56,007
Years	45
Total Acre Feet	2,520,324
PV/ acre foot	**$ 718.93**

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Socioeconomic Impact of Lower Guadalupe Water Supply Project
Present Value Summary

Economic Benefits to the Basin

Construction: Local Payroll & Materials	$	315,096,330
Commerce from New Residents (Bexar County)		90,803,675,039
Total Benefits (discounted)	**$**	**91,118,771,369**
TOTAL NET ECONOMIC IMPACT (discounted to Year 2005)	**$**	**91,118,771,369**

ANNUAL CALCULATION

	$-Value per year	*(Applicable for income only)* disposable	locally spent	Multiplier effect (ME)	$-Value per year w/ ME	Year of Value	First Year of Impact	Last Year of Impact
Basin Benefits								
Construction:								
Local Payroll and Materials								
Refugio County	$ 1,130,090	92.8%	40.6%	1.12	$ 477,185	2002	2010	2014
Goliad County	1,000,162	92.5%	38.4%	1.13	402,054	2002	2010	2014
Karnes County	2,229,864	93.5%	45.5%	1.18	1,119,626	2002	2010	2014
Wilson County	4,678,586	90.8%	38.7%	1.12	1,843,487	2002	2010	2014
Bexar County	201,090,711	85.3%	68.4%	1.54	309,541,254	2002	2010	2014
Victoria County	12,139,378	87.4%	60.0%	1.35	16,404,951	2002	2010	2014
Subtotal								
Commerce from New Residents								
Per Capita Income (disposable, locally spent)	$ 27,810	85.3%	68.4%	1.54	$ 24,984	2005	2025	2054
Assumed Increase in Population								
Commerce from New Residents (Bexar County)								

Total Benefits

PRESENT VALUE CALCULATION

Basin Benefits
Construction:
Local Payroll and Materials
Commerce from New Residents
Total Benefits (discounted)

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ANNUAL CALCULATION

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Basin Benefits											
Construction:											
Local Payroll and Materials											
Refugio County	$ -	$ -	$ -	$ -	$ -	$ 120,897	$ 124,524	$ 128,259	$ 132,107	$ 136,070	$ -
Goliad County	-	-	-	-	-	101,862	104,918	108,065	111,307	114,647	-
Karnes County	-	-	-	-	-	283,662	292,172	300,937	309,965	319,264	-
Wilson County	-	-	-	-	-	467,055	481,067	495,499	510,363	525,674	-
Bexar County	-	-	-	-	-	78,423,520	80,776,225	83,199,512	85,695,498	88,266,363	-
Victoria County	-	-	-	-	-	4,156,260	4,280,948	4,409,376	4,541,658	4,677,907	-
Subtotal	$ -	$ -	$ -	$ -	$ -	$ 83,553,255	$ 86,059,853	$ 88,641,649	$ 91,300,898	$ 94,039,925	$ -
Commerce from New Residents											
Per Capita Income (disposable, locally spent)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Assumed Increase in Population	-	-	-	-	-	-	-	-	-	-	-
Commerce from New Residents (Bexar County)	-	-	-	-	-	-	-	-	-	-	-
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Benefits	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 83,553,255**	**$ 86,059,853**	**$ 88,641,649**	**$ 91,300,898**	**$ 94,039,925**	**$ -**

PRESENT VALUE CALCULATION

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Basin Benefits											
Construction:											
Local Payroll and Materials	$ -	$ -	$ -	$ -	$ -	$ 65,466,162	$ 64,219,187	$ 62,995,965	$ 61,796,042	$ 60,618,974	$ -
Commerce from New Residents	-	-	-	-	-	-	-	-	-	-	-
Total Benefits (discounted)	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 65,466,162**	**$ 64,219,187**	**$ 62,995,965**	**$ 61,796,042**	**$ 60,618,974**	**$ -**

ANNUAL CALCULATION

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Basin Benefits											
Construction:											
Local Payroll and Materials											
Refugio County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Goliad County	-	-	-	-	-	-	-	-	-	-	-
Karnes County	-	-	-	-	-	-	-	-	-	-	-
Wilson County	-	-	-	-	-	-	-	-	-	-	-
Bexar County	-	-	-	-	-	-	-	-	-	-	-
Victoria County	-	-	-	-	-	-	-	-	-	-	-
Subtotal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents											
Per Capita Income (disposable, locally spent)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 45,123	$ 46,477
Assumed Increase in Population	-	-	-	-	-	-	-	-	-	18,612	37,703
Commerce from New Residents (Bexar County)	-	-	-	-	-	-	-	-	-	839,819,212	1,752,296,445
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 839,882,947	$ 1,752,380,624
Total Benefits	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 839,882,947**	**$ 1,752,380,624**

PRESENT VALUE CALCULATION

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Basin Benefits											
Construction:											
Local Payroll and Materials	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents	-	-	-	-	-	-	-	-	-	316,519,029	628,973,430
Total Benefits (discounted)	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 316,519,029**	**$ 628,973,430**

ANNUAL CALCULATION

	2027	2028	2029	2030	2031	2032	2033	2034
Basin Benefits								
Construction:								
Local Payroll and Materials								
Refugio County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Goliad County	-	-	-	-	-	-	-	-
Karnes County	-	-	-	-	-	-	-	-
Wilson County	-	-	-	-	-	-	-	-
Bexar County	-	-	-	-	-	-	-	-
Victoria County	-	-	-	-	-	-	-	-
Subtotal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents								
Per Capita Income (disposable, locally spent)	$ 47,871	$ 49,307	$ 50,786	$ 52,310	$ 53,879	$ 55,496	$ 57,160	$ 58,875
Assumed Increase in Population	57,285	77,372	97,975	119,449	133,743	148,275	163,050	178,072
Commerce from New Residents (Bexar County)	2,742,293,896	3,814,971,230	4,975,803,074	6,248,380,382	7,205,960,269	8,228,622,920	9,320,037,043	10,484,062,424
	$ 2,742,399,052	$ 3,815,097,909	$ 4,975,951,836	$ 6,248,552,142	$ 7,206,147,891	$ 8,228,826,691	$ 9,320,257,254	$ 10,484,299,372
Total Benefits	**$ 2,742,399,052**	**$ 3,815,097,909**	**$ 4,975,951,836**	**$ 6,248,552,142**	**$ 7,206,147,891**	**$ 8,228,826,691**	**$ 9,320,257,254**	**$ 10,484,299,372**

PRESENT VALUE CALCULATION

	2027	2028	2029	2030	2031	2032	2033	2034
Basin Benefits								
Construction:								
Local Payroll and Materials	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents	937,452,815	1,242,045,165	1,542,836,861	1,845,164,046	2,026,609,562	2,204,022,817	2,377,482,148	2,547,064,396
Total Benefits (discounted)	**$ 937,452,815**	**$ 1,242,045,165**	**$ 1,542,836,861**	**$ 1,845,164,046**	**$ 2,026,609,562**	**$ 2,204,022,817**	**$ 2,377,482,148**	**$ 2,547,064,396**

ANNUAL CALCULATION

	2035	2036	2037	2038	2039	2040	2041	2042
Basin Benefits								
Construction:								
Local Payroll and Materials								
Refugio County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Goliad County	-	-	-	-	-	-	-	-
Karnes County	-	-	-	-	-	-	-	-
Wilson County	-	-	-	-	-	-	-	-
Bexar County	-	-	-	-	-	-	-	-
Victoria County	-	-	-	-	-	-	-	-
Subtotal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents								
Per Capita Income (disposable, locally spent)	$ 60,642	$ 62,461	$ 64,335	$ 66,265	$ 68,253	$ 70,300	$ 72,409	$ 74,581
Assumed Increase in Population	193,345	208,873	224,661	240,712	257,032	273,898	286,016	298,277
Commerce from New Residents (Bexar County)	11,724,759,483	13,046,399,303	14,453,474,138	15,950,708,444	17,543,070,446	19,255,078,055	20,710,177,019	22,245,921,525
	$ 11,725,013,470	$ 13,046,670,637	$ 14,453,763,133	$ 15,951,015,421	$ 17,543,395,730	$ 19,255,422,253	$ 20,710,535,445	$ 22,246,294,383
Total Benefits	**$ 11,725,013,470**	**$ 13,046,670,637**	**$ 14,453,763,133**	**$ 15,951,015,421**	**$ 17,543,395,730**	**$ 19,255,422,253**	**$ 20,710,535,445**	**$ 22,246,294,383**

PRESENT VALUE CALCULATION

	2035	2036	2037	2038	2039	2040	2041	2042
Basin Benefits								
Construction:								
Local Payroll and Materials	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents	2,712,844,935	2,874,897,700	3,033,295,211	3,188,108,605	3,339,407,659	3,490,758,595	3,575,765,621	3,658,022,187
Total Benefits (discounted)	**$ 2,712,844,935**	**$ 2,874,897,700**	**$ 3,033,295,211**	**$ 3,188,108,605**	**$ 3,339,407,659**	**$ 3,490,758,595**	**$ 3,575,765,621**	**$ 3,658,022,187**

ANNUAL CALCULATION

	2043	2044	2045	2046	2047	2048	2049	2050
Basin Benefits								
Construction:								
Local Payroll and Materials								
Refugio County	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Goliad County	-	-	-	-	-	-	-	-
Karnes County	-	-	-	-	-	-	-	-
Wilson County	-	-	-	-	-	-	-	-
Bexar County	-	-	-	-	-	-	-	-
Victoria County	-	-	-	-	-	-	-	-
Subtotal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents								
Per Capita Income (disposable, locally spent)	$ 76,819	$ 79,123	$ 81,497	$ 83,942	$ 86,460	$ 89,054	$ 91,726	$ 94,478
Assumed Increase in Population	310,683	323,235	335,935	348,785	361,787	374,943	388,254	401,836
Commerce from New Residents (Bexar County)	23,866,290,520	25,575,448,072	27,377,751,695	29,277,761,039	31,280,246,966	33,390,201,026	35,612,845,342	37,964,454,391
	$ 23,866,678,021	$ 25,575,850,430	$ 27,378,169,127	$ 29,278,193,766	$ 31,280,695,214	$ 33,390,665,023	$ 35,613,325,321	$ 37,964,950,704
Total Benefits	**$ 23,866,678,021**	**$ 25,575,850,430**	**$ 27,378,169,127**	**$ 29,278,193,766**	**$ 31,280,695,214**	**$ 33,390,665,023**	**$ 35,613,325,321**	**$ 37,964,950,704**

PRESENT VALUE CALCULATION

	2043	2044	2045	2046	2047	2048	2049	2050
Basin Benefits								
Construction:								
Local Payroll and Materials	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commerce from New Residents	3,737,589,132	3,814,526,070	3,888,891,419	3,960,742,422	4,030,135,168	4,097,124,619	4,161,764,627	4,225,311,237
Total Benefits (discounted)	**$ 3,737,589,132**	**$ 3,814,526,070**	**$ 3,888,891,419**	**$ 3,960,742,422**	**$ 4,030,135,168**	**$ 4,097,124,619**	**$ 4,161,764,627**	**$ 4,225,311,237**

ANNUAL CALCULATION

	2051	2052	2053	2054	Total
Basin Benefits					
Construction:					
Local Payroll and Materials					
Refugio County	$ -	$ -	$ -	$ -	$ 641,857
Goliad County	-	-	-	-	540,799
Karnes County	-	-	-	-	1,505,999
Wilson County	-	-	-	-	2,479,658
Bexar County	-	-	-	-	416,361,118
Victoria County	-	-	-	-	22,066,150
Subtotal	$ -	$ -	$ -	$ -	$ 443,595,580
Commerce from New Residents					
Per Capita Income (disposable, locally spent)	$ 97,312	$ 100,231	$ 103,238	$ 106,335	
Assumed Increase in Population	414,144	426,582	439,151	451,854	
Commerce from New Residents (Bexar County)	40,301,091,748	42,756,802,184	45,337,160,429	48,047,990,341	611,329,879,061
	$ 40,301,603,204	$ 42,757,328,997	$ 45,337,702,818	$ 48,048,548,530	$ 611,329,879,061
Total Benefits	**$ 40,301,603,204**	**$ 42,757,328,997**	**$ 45,337,702,818**	**$ 48,048,548,530**	**$ 611,773,474,641**

PRESENT VALUE CALCULATION

	2051	2052	2053	2054	Total
Basin Benefits					
Construction:					
Local Payroll and Materials	$ -	$ -	$ -	$ -	**$ 315,096,330**
Commerce from New Residents	4,271,781,731	4,316,265,592	4,358,810,219	4,399,462,023	**90,803,675,039**
Total Benefits (discounted)	**$ 4,271,781,731**	**$ 4,316,265,592**	**$ 4,358,810,219**	**$ 4,399,462,023**	**$ 91,118,771,369**

Table 1
Short Term Benefits From Construction

	Percent of Total		Value	
Projected Construction Cost		$	635,053,692	(1)
Direct Construction Employment (Local Payroll)	15%	$	95,258,054	(2)
Local Purchase of Construction Materials	20%	$	127,010,738	(3)
Total Short Term Benefits From Construction		$	222,268,792	(4)
Distribution to Counties in Basin				
Refugio County	0.5%	$	1,130,090	(5)
Goliad County	0.4%	$	1,000,162	
Karnes County	1.0%	$	2,229,864	
Wilson County	2.1%	$	4,678,586	
Bexar County	90.5%	$	201,090,711	
Victoria County	5.5%	$	12,139,378	

(1) Estimated Project Cost Region L 2006 for Raw Water Only, 2002 Dollars
(2) Estimated Construction Based Local Payroll, RSMeans Manuals
(3) Estimated Value of Local Construction Commerce, RSMeans Manuals
(4) Estimated Value of Short Term Benefits from Project Construction
(5) U.S. Census, Population Figures, 2000

Texas Water Development Board
Socioeconomic Impact of Selected Interbasin Transfers in Texas
Results of Market Survey of Water Rights Transactions

Seller	Buyer	Priority Date	Yield in Acre-Feet	Transaction Price	Price per Acre - Foot
Brazos Electric Cooperative	Brazos River Authority	2/7/1949	38,000	$ 550,000	$ 14
Pierce Ranch in Wharton County	Lower Colorado River Authority	2/1/2000	55,000	17,000,000	309
CL-Ranch & Lynch Brothers	El Paso Water Utilities	6/1/2002	17,831	8,200,000	460
Raymond D. Hegwar, et	Canyon Regional Water Authority	6/4/1951	86	43,000	500
Lipscomb; et	City of Victoria	8/15/1951	260	130,000	500
Jess Yell Womack II	Guadalupe Blanco River Authority	3/1/1951	3,000	1,800,000	600
The Nature Conservancy	City of Laredo	6/1/2002	350	490,000	1,400
Private Landowners	Schertz/Seguin Local Gov. Corp.	6/1/2001	20,000	51,040,000	2,552
New Mexico Farmers	El Paso Water Utilities	12/1/2001	3,080	8,000,000	2,597
	Simple Average				$ 993
	Weighted Average				$ 634