



WaterSMART: TITLE XVI FEASIBILITY STUDY OF  
WATER RECLAMATION AND REUSE IN  
Hudson Oaks, TX

**CITY OF HUDSON OAKS**

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# Table of Contents

Standard Form 424 (Cover Page).....	i
Standard Form 424 A (Budget Form).....	vi
Standard Form 424 B Assurances (Non-construction Programs).....	viii
Title Page.....	xi
Table of Contents.....	xii
Section 1: Technical Proposal .....	1
A. Executive Summary.....	1
B. Technical Study Description.....	1
C. Evaluation Criteria.....	7
1) Evaluation Criterion 1: Statement of Problems and Needs	
2) Evaluation Criterion 2: Water Reclamation and Reuse Opportunities	
3) Evaluation Criterion 3: Description of Potential Alternatives	
4) Evaluation Criterion 4: Stretching Water Supplies	
5) Evaluation Criterion 5: Environment and Water Quality	
6) Evaluation Criterion 6: Legal and Institutional Requirements	
7) Evaluation Criterion 7: Renewable Energy and Energy Efficiency	
8) Evaluation Criterion 8: Watershed Perspective	
Section 2: Required Permits or Approvals.....	21
Section 3: Funding Plan.....	21
Section 4: Letters of Commitment.....	22
Section 5: Official Resolution .....	23
Section 6: Project Budget Proposal .....	
A. Budget Narrative .....	26
Section 7: Grant Development Quote for Services .....	32
Section 8: Letters of Support .....	34
1) Letter of Support – East Parker County Chamber of Commerce	

## **SECTION 1** **Technical Proposal**

### **A. Technical Proposal - Executive Summary**

**Date:** March 3, 2015  
**Applicant Name:** City of Hudson Oaks, Texas  
**City:** Hudson Oaks  
**County:** Parker County  
**State:** Texas

#### **Proposal Summary**

The City of Hudson Oaks, Texas (population 1,900<sup>1</sup>) requests \$147,600 to analyze the feasibility of reusing the City's treated effluent and storm water runoff as a means to stretch our limited water supply. The City is located just 24 miles west of Fort Worth (named by the U.S. Census Bureau as the fastest-growing city over 500,000 between 2000 and 2013). The region's strong job market and international connectivity are expected to remain a draw for new residents and businesses. Our City is planning for a 300+ percent population increase by 2050 (full capacity is projected at 6,718). This rapid regional growth means a higher draw on water resources from Hudson Oaks and surrounding communities. As Texas enters its fifth year of historic drought conditions, the City is planning for improved water efficiency to provide more flexibility during water shortages and ensure long-term sustainability. **The study will analyze three potential alternatives for water reclamation and reuse including: 1) Constructing a wastewater treatment plant in the City of Hudson Oaks to treat and reuse local effluent; 2) Collecting and utilizing storm water runoff for reuse and distribution in the community, as well as for an added environmental habitat and recreation amenity; and 3) Pumping treated wastewater from the City of Weatherford Wastewater Treatment Plant to Hudson Oaks for reuse.** Our goal is to increase drinking water by using reclaimed water for non-potable uses such as irrigation of landscaped areas, parks, golf courses, and athletic fields; fire protection; toilet and urinal flush water in public facilities; recreation enhancement including fishing and regional outdoor activities; and environmental and species preservation. This feasibility study will take approximately 18 months to complete upon execution of a grant agreement by September 30, 2015. It is estimated that all work will be completed by March 31, 2017.

### **B. Technical Proposal – Technical Study Description**

The proposed analysis of water reclamation and reuse in the City of Hudson Oaks is part of a strategic plan to establish long-term water sustainability. The City of Hudson Oaks covers approximately 2.6 square miles. Forty-nine percent of this area is vacant land, and presents residential and business development opportunities as Fort Worth continues to rapidly expand westward. The City is at a defining time in terms of future service provision and the development of utility infrastructure, and is integrating sustainable water principles into its

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<sup>1</sup> 2010 North Texas Council of Governments population estimate.

framework as we prepare for the impending residential and commercial boom. First, we recently completed a middle-median landscape project utilizing 100 percent drought tolerant plants and grasses, and are expanding water-wise landscaping to our parks and other transportation corridors. The City is also migrating to a centralized, automated water meter reading system, which will ultimately allow customers to monitor their own use in real-time from their home computer, preventing over-watering, and providing for early leak detection. Next, we are implementing City-wide evapotranspiration controllers (ETCs), which evaluate the moisture content in the soil and air, and adjust irrigation timing accordingly. Our City Council also recently approved a budget scenario that includes demand-pay rates for water customers, and the rate structure will be implemented following the complete transfer to our automated meter-reading system. As we plan for our future, long-term water-sustainability is at the forefront.

The City currently provides 160 million gallons of potable water (491 acre feet per year) to our 1,197 customers annually. Approximately twenty-five percent of the City's water is purchased from the neighboring City of Weatherford, approximately six miles west of Hudson Oaks. In 2013, this equated to 42 million gallons of purchased water. Weatherford's water sources include Lake Benbrook (a U.S. Army Corps of Engineers water project) and Weatherford Lake, which are at levels of 69 and 59 percent, respectively. We draw the remaining 75 percent of our water from the Paluxy Aquifer (drained by the Clear Fork Trinity River), as do the surrounding Fort Worth suburbs. The Paluxy Aquifer comprises the upper layer of the Trinity Aquifer from the Red River south to the Texas Hill Country. It is one of nine major aquifers that supply about 60 percent of the state's water supply.<sup>2</sup> As the effects of the drought continue, and residential and commercial development soar, more wells are being drilled into the aquifer than ever before (at triple the historical rate). As a result, the water table has fallen approximately 100 feet in the last 70-80 years.<sup>3</sup>

The City has identified three possible water reuse projects for analysis that could significantly reduce the draw on local and regional water resources:

- 1) ***Constructing a wastewater treatment plant in the City of Hudson Oaks for local treatment and reuse of effluent.*** The City will study the feasibility of constructing a local wastewater treatment plant for effluent treatment and reuse. Currently, Hudson Oaks pumps approximately 20 million gallons of wastewater six miles to the Weatherford Wastewater Treatment Plant (WWTP). The City estimates that if all households were provided city sewer service, 215 acre feet per year (AFY) of treated effluent could be reused.<sup>4</sup> This equates to nearly half of the volume of our potable water usage each year. Currently, only a portion of Hudson Oaks is connected to the

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<sup>2</sup> Annette Nevins, "Water Woes: Digging Deep," *Denton Record-Chronicle.com*, May 6, 2014, <<http://www.dentonrc.com/local-news/local-news-headlines/20140506-water-woes-digging-deep.ece>>, accessed on February 18, 2015.

<sup>3</sup> Ibid.

<sup>4</sup> 1,900 (our population) x 100 gallons per capita per day/1 gallon per 0.00495113169 cubic yard x 365 days per year = roughly 0.35 million cubic yards per year, or 215 acre feet per year.

City sewer system, and the balance of our customers use septic systems. The proposed study will include the feasibility of providing complete sewer service to the City, including phased service options. As the population is expected to triple by 2050, the yield could be more than 645 AFY at full build-out with a comprehensive sewer system. The proposed study will investigate the feasibility of developing purple pipe (non-potable) infrastructure as a key component of all proposed water reuse scenarios. The City is interested in investigating the full range of available uses for treated effluent. Primary uses will include landscaping irrigation for residential, municipal, and business uses; fire protection; and toilet and urinal flush for public facilities.

2) ***Collecting and reusing storm water runoff for reuse and distribution in the community.***

The proposed feasibility study will include a complete *Drainage Pattern Study* of the City, and identify an optimal location for a storm water retention pond to be used for retention and non-potable water distribution to the community. The City will study the feasibility of constructing a pond that retains a permanent pool of water, which will be treated via natural systems for reuse. The retention pond will improve storm water quality by allowing sediments and associated pathogens to settle out, alleviate localized flooding during development, and interrupt the process of storm water (with collected toxins and debris) from entering the local natural waterbodies.<sup>5</sup> Initial estimates show a potential collection and storage capacity of 1,426 AFY.<sup>6</sup> The consultant will study the feasibility of constructing purple pipe infrastructure for irrigation and other non-potable water uses from the pond. The City sees the potential retention pond as having multiple benefits including uses such as those mentioned above (irrigation and public facilities), and as a natural habitat for fish and North Texas wildlife.

3) ***Reusing treated effluent from the City of Weatherford's Wastewater Treatment Plant.***

As mentioned above, effluent from the City of Hudson Oaks is pumped approximately six miles to the Weatherford WWTP. The Weatherford WWTP treats between 19 to 20 million gallons annually (approximately 61 AFY) of Hudson Oaks wastewater, which is then pumped for discharge into Town Creek. Hudson Oaks enjoys a mutually beneficial relationship with Weatherford. In addition to pumping our wastewater to the Weatherford WWTP, we purchase 25 percent of our potable water from the City. The City would like to investigate the feasibility of developing infrastructure that would return treated effluent to Hudson Oaks for multiple uses. As with the preceding two scenarios, purple pipe infrastructure would be needed to distribute treated water throughout the City.

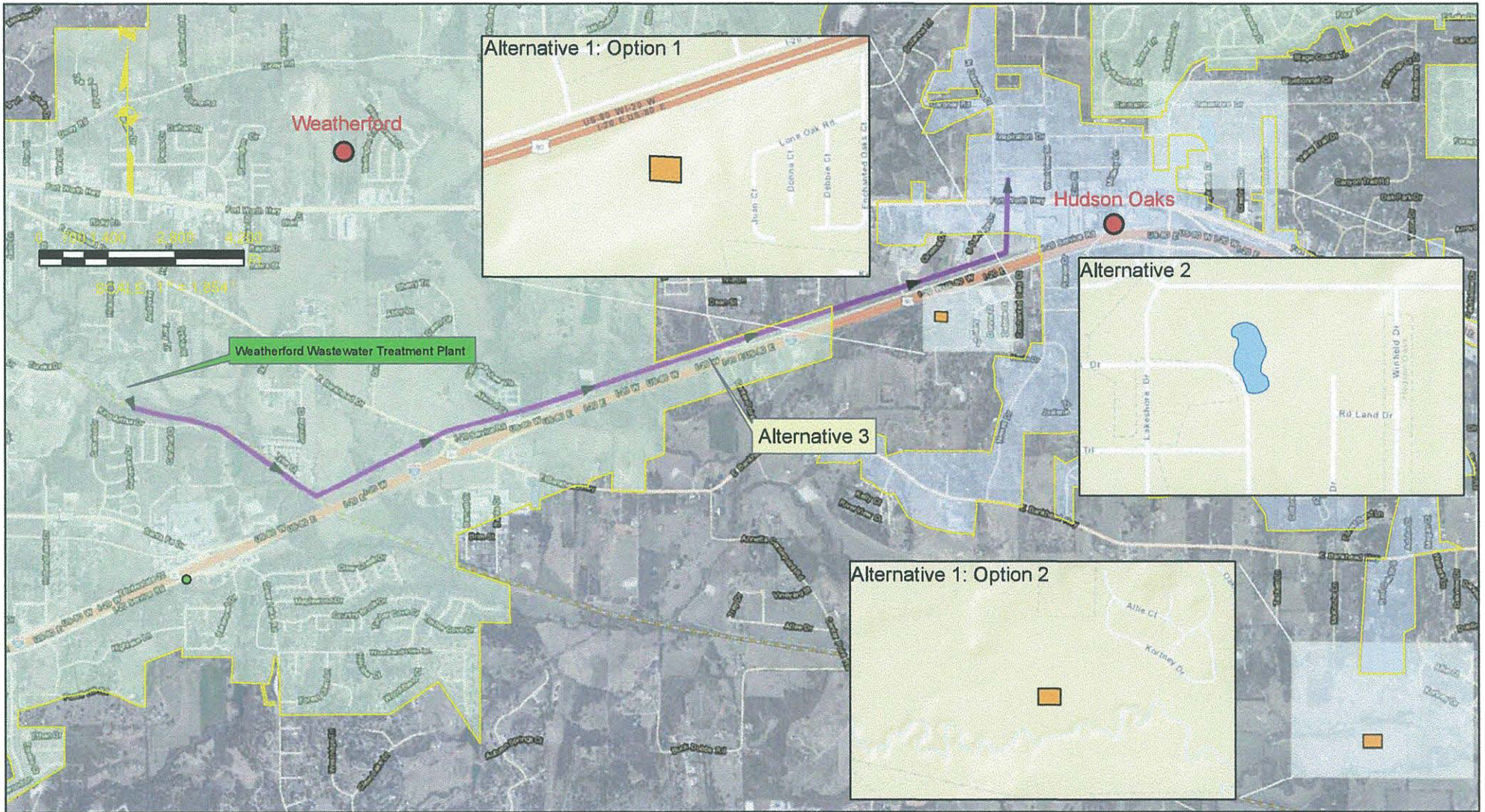
**Please see the Project Map on the following page for a visual exhibit of the project area.**

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<sup>5</sup> "National Management Measures to Control Nonpoint Source Pollution: Management Measure Number 5: New Development Runoff Treatment," *U.S. Environmental Protection Agency*, November 2005, <[http://water.epa.gov/polwaste/nps/urban/upload/urban\\_ch05.pdf](http://water.epa.gov/polwaste/nps/urban/upload/urban_ch05.pdf)>, accessed on February 25, 2015.

<sup>6</sup>  $34.7 \text{ inches average annual rainfall} / 36 \text{ inches per yard} \times (2.6 \text{ square miles} / 1 \text{ square mile per } 3,097,600 \text{ square yard}) \times 0.3 \text{ (assumed runoff)} = \text{roughly } 2.3 \text{ million cubic yards per year, or } 1,426 \text{ acre feet.}$

# City of Hudson Oaks Project Map



**TITLE XVI WATER RECLAMATION AND REUSE PROGRAM FEASIBILITY STUDY**  
Alternative 1: New Hudson Oaks Treatment Plant with Effluent Recycle  
Alternative 2: Storm water Runoff Retention Pond  
Alternative 3: Weatherford Treatment Plant Effluent Recycle

To help preserve and effectively leverage our limited water supplies, the City of Hudson Oaks seeks to proactively investigate these alternative sources for potable and non-potable water. As such, the proposed feasibility study will include, but not be limited to, the following activities:

**Task 1. Execute Agreement.** Upon notification from the Bureau of Reclamation (BOR) of a grant award, the Project Manager will work with the BOR program officer to negotiate the grant agreement and deliverables.

**Deliverable:** Executed grant agreement.

**Task 2. Contract with Consultant.** The Project Manager and Assistant Project Manager will negotiate the contract and deliverables with a qualified consultant to assist in completing the feasibility study.

**Deliverable:** Executed contract.

**Task 3. Collect Data.** The consultant will collect data regarding water use and water sources via interviews, site visits, available public data, and other means deemed necessary to support thorough investigation. The consultant will assess potable and non-potable water sources, identify reclaimed water sources, and quantify potential availability of reclaimed water. The consultant will provide a detailed analysis of phased options for complete sewer service to all municipal customers. The consultant will define the proposed study, including objectives and the scope of the study. The consultant and City staff will work with the City of Weatherford to determine the viability and the details of an effluent reuse agreement.

**Deliverables:** Data reports, tables/graphs, visual exhibits, meeting notes, summary report of findings, objectives and scope of proposed study.

**Task 4. Evaluate Reclaimed Water Market.** The consultant will evaluate potential uses of reclaimed water including irrigation of landscaped areas (residential, commercial, and municipal), parks, golf courses, athletic fields, and other public spaces; fire protection; and toilet and urinal flush in public facilities. The consultant will quantify future demands, and include water quality and regulatory considerations.

**Deliverables:** Summary report of findings, tables/graphs, visual exhibits, meeting notes.

**Task 5. Evaluate Alternatives.** The consultant will develop comprehensive scenarios evaluating the alternatives to water reuse projects, and compare short- and long-term results with proposed water reuse project scenarios. This task is especially important in light of the ongoing drought and regional population projections. As growing municipalities compete for resources, shortages may occur and rates for purchasing water will likely increase. The consultant will consider scenarios including, but not limited to: continued drilling/pumping of water from the Paluxy Aquifer; increased volume and unit price of purchased water from the City of Weatherford; and construction of infrastructure (including a review of water-rights agreements or issues necessary) to pump water from Lake Weatherford and/or Benbrook Lake.

**Deliverables:** Summary report of findings, tables/graphs, visual exhibits.

**Task 6. Complete Comprehensive Drainage Pattern Study.** Note to BOR reviewer: This study will be paid for by the City and used as local match for the proposed project. The drainage pattern study will analyze the storm water runoff pattern within the City of Hudson Oaks, and the consultant will utilize study findings to guide development of plans for the storm water retention pond proposed for the feasibility study. The Drainage Pattern Study will include: performing a City-wide hydrologic analysis of storm water runoff; performing an open channel and closed storm drain system hydraulic analysis; delineating floodplains and determining natural flow patterns; and formulating capital improvement alternatives for storm water capture and reuse.

**Deliverables:** City of Hudson Oaks 2015 Drainage Pattern Study

**Task 7. Conceptualize Reclaimed Water Facilities.** The following facilities will be conceptualized for the proposed study: 1) *New Hudson Oaks wastewater treatment plant.* The consultant will identify and evaluate sites for a local wastewater treatment plant, evaluate the feasibility of offering sewer connection to new and existing customers, evaluate treatment alternatives to achieve the level of treatment needed for effluent reuse, plan pipe size, and evaluate alignments to construct a recycled water line from the new wastewater treatment plant to water reuse customers; 2) *Storm water runoff retention pond.* The consultant will plan pipe sizes and evaluate alignments for the storm water collection system. The consultant will utilize information gleaned from the *City of Hudson Oaks 2015 Drainage Pattern Study* to identify the potential site and size of the retention pond; and 3) *Infrastructure to utilize treated effluent from the Weatherford WWTP.* The consultant will plan pipe size and evaluate alignments to construct a recycled water line from Weatherford WWTP to Hudson Oaks.

**Deliverables:** Conceptual design visuals of all facilities, cost estimates, summary report of findings.

**Task 8. Plan Reclaimed Water Distribution System.** The consultant will review Texas Commission on Environmental Quality (TCEQ) and other agency requirements for reclaimed water distribution infrastructure, develop a plan for the system, and provide a phased plan for market service.

**Deliverables:** Summary report of regulatory requirements, conceptual design visuals of distribution system, cost estimates, phased plan for market service.

**Task 9. Evaluate Project Economics.** The consultant will perform a life-cycle cost analysis of all alternatives including, but not limited to costs of installation, operation, and maintenance of all systems, and revenue potential. The consultant will also develop and evaluate a storm water utility fee. The consultant will review the City's existing storm water management program, analyze the cost of the current storm water management service, identify necessary future changes to the storm water management program, determine the cost for those changes, and analyze the possibility of expanding the utility billing system for the inclusion of storm water charges.

**Deliverables:** Life-cycle cost analysis of all alternatives, summary report on storm utility fee.



**Task 10. Evaluate Environmental Impacts.** The consultant will perform a Phase I Environmental Site Assessment, facilitate a preliminary jurisdictional determination for wetlands, conduct a threatened and endangered species habitat assessment, and review cultural resource protections for potential sites included in all alternatives.

**Deliverables:** Phase I Environmental Assessment, preliminary Jurisdictional Determination for Wetlands, Threatened and Endangered Species Habitat Assessment, summary report of cultural resource protections for potential project sites.

**Task 11. Provide Study Results.** The consultant will prepare a draft of the feasibility study report for review by the City of Hudson Oaks. The draft report shall include all above-deliverables, including potential alternatives, and the recommended course of action. The consultant will incorporate City edits made to the draft report to develop the final feasibility study report. The final report shall summarize the information gathered, and document the tasks completed and work performed for the project. It will include the scope of work for implementation of the project.

**Deliverables:** Draft Feasibility Study Report, Final Feasibility Study Report.

**Task 12. Recommended Course of Action.** The consultant will define the recommended course of action for implementing the findings from the feasibility study. This course of action shall include, but not be limited to the following: reuse policies and procedures; environmental documentation and processing; approval and adoption of environmental documents by City Council; regulatory processing/permitting; financing considerations; marketing and outreach strategies for additional community buy-in; and phased design and construction.

**Deliverables:** Comprehensive summary report of recommended course of action (to be included in the Draft Feasibility Study Report and Final Feasibility Study Report).

**Task 13. Reporting.** The Assistant Project Manager and the Administrative Assistant will ensure proper reporting of required contract documentation, deliverables, and financial reports.

**Deliverables:** Quarterly Reports, Requests for Reimbursement, Final Report

## **C. Technical Proposal: Evaluation Criteria**

### **1) Statement of Problems and Needs**

#### **Water Resource Management Problems**

**Drought.** The most pressing issue facing the City's water supply is the ongoing drought. In the City of Hudson Oaks 2012 Comprehensive Plan, the regional water crisis is listed as one of the three top 'threats' in our strengths, weaknesses, opportunities, and threats analysis (S.W.O.T.), which guides priorities and strategies for smart community development and resource efficiency. As stated previously, the City's main water source, the Paluxy Aquifer, has dropped approximately 100 feet in the last 80 years. The Texas Water Development Board's *Texas Drought Report* stated that "exceptional drought, the worst category, strengthened its hold on

North Texas,” with 39 percent of the state currently in moderate to exceptional drought.<sup>7</sup> The National Weather Service’s Weather Forecast Office reports that some communities in the City’s neighboring county of Palo Pinto are “within weeks of running out of water.”<sup>8</sup> The resource goes on further to say, “With little to suggest that the dying breaths of El Niño conditions will enhance precipitation amounts across Texas, the U.S. Seasonal Drought Outlook is portending a continuation (or intensification) of the ongoing drought conditions across North and Central Texas.”<sup>9</sup>

Additionally, Hudson Oaks purchases the balance of its water supply from the City of Weatherford, who draws water from Lake Weatherford and Benbrook Lake.

The City of Weatherford also recently approved a contract to provide water for Willow Park, and as surrounding municipalities grow as projected, multiple contracts pulling from the same sources of water may be in our future. Both lakes are low – Lake Weatherford is currently 59 percent full, and Benbrook Lake is 69 percent full.<sup>10</sup> Along with the City of Weatherford (population 27,021), Benbrook Lake also supplies water to the City of Benbrook (population 22,021), and Fort Worth (population 781,000). Drought continues to put the certainty of future water resources at risk.

**Population Increase.** The next most critical issue facing our water supply is the rapid population increase in North Texas, as mentioned earlier. In 2010, a team of city officials from across multiple cities, regional planners, academics, and community representatives published *Vision North Texas: Understanding our Options for Growth-North Texas 2050 (VNT)*. The document is a culmination of five years of intensive community participation and planning

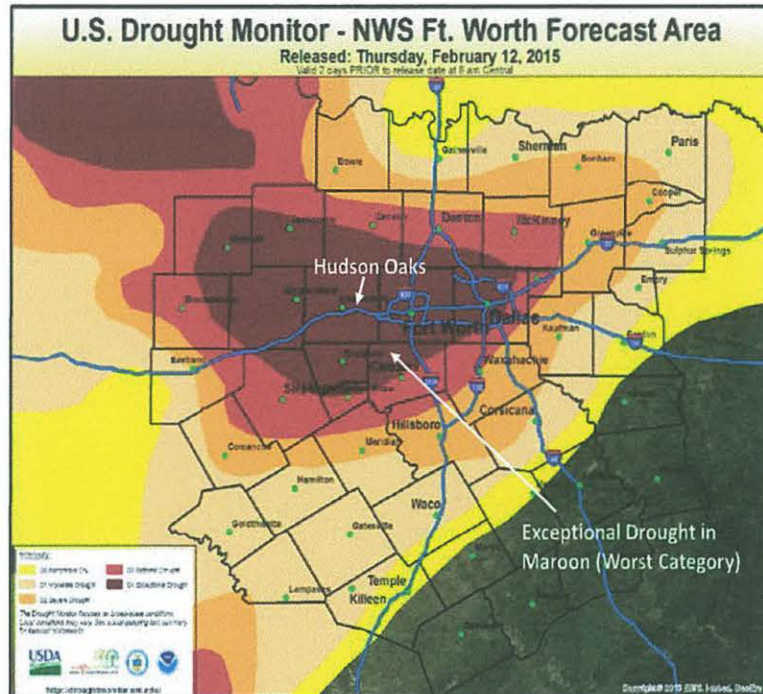


Figure 1. The map above shows that the City of Hudson Oaks is located an area of continued ‘Exceptional Drought.’ Source: National Weather Service Weather Forecast Office - Dallas/Fort Worth Office.

<sup>7</sup> “Texas Drought Report for the Week of 2/16/15,” *Texas Water Development Board*, February 18, 2015, <[http://www.twdb.texas.gov/newsmedia/drought/doc/weekly\\_drought\\_report.pdf](http://www.twdb.texas.gov/newsmedia/drought/doc/weekly_drought_report.pdf)>, accessed on February 18, 2015.

<sup>8</sup> “Drought Information,” *National Weather Service Weather Forecast Office*, February 18, 2015, <<http://www.srh.noaa.gov/fwd/?n=drought>>, accessed on February 18, 2015.

<sup>9</sup> *Ibid.*

<sup>10</sup> Water Data for Texas, *Texas Water Development Board*, February 20, 2015, <<http://waterdatafortexas.org/reservoirs/individual/benbrook>>, accessed on February 20, 2015.

efforts to guide the sixteen-county region of North Texas in accommodating a population that is expected to reach 12 million by 2050 (nearly double today's regional population). VNT projects the following based on current development trends:

The region is expected to lose 900,000 acres of agricultural land, as well as substantial areas of natural habitat. The amount of impervious surface in the region (buildings and pavement) will double, increasing runoff and affecting water quality in streams, severity of floods and the temperatures experienced by people in the region's urban areas. More than half of the new households will live in the watersheds of the region's water supply lakes, affecting the water quality of these lakes and the drinking water they provide.<sup>11</sup>

This extraordinary growth presents a critical water resource management problem for the region. Relying on purchased water from the City of Weatherford, and continued drilling and pumping from the Paluxy Aquifer present financial and other challenges for our City. As the flocks of residents continue to make North Texas their home, multiple communities will grow and compete for these resources. The needs of Hudson Oaks are in danger of being lost to competing municipalities with more available resources.

#### **Statement of Needs**

Our needs are both immediate and long-term. Expected development coupled with ongoing drought will increase the draw on our natural and municipal resources, and it is imperative that we incorporate strategies to mitigate the impacts of the region's water shortages into our plan for service to our growing community.

The City currently serves 1,197 water customers, and pumps 160 million gallons of potable water to those customers annually. At full build-out we can expect our water needs to triple. This means we need to find an additional 320 million gallons (982 acre feet) of potable water for our residents each year. Provided we maintain our current agreement with the City of Weatherford to purchase approximately 42 million gallons of water each year, that still leaves 278 million gallons of potable water needs for our projected population. The proposed feasibility study will analyze the feasibility of adding projects including a City of Hudson Oaks wastewater treatment plant, a storm water retention pond, and infrastructure to transport effluent currently being pumped to Weatherford back to our City for reuse. These projects have a potential yield of 2,132 AFY (695 million gallons) of recycled water to augment our potable water supplies each year. This would more than meet our current and future population's water needs.

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<sup>11</sup> Vision North Texas Research Team, "Vision North Texas: Understanding our Options for Growth-North Texas 2050," Dallas, Tx., 2010, p. 2, <[http://www.visionnorthtexas.org/regional\\_summit/North\\_Texas\\_2050.pdf](http://www.visionnorthtexas.org/regional_summit/North_Texas_2050.pdf)>, accessed on February 19, 2015.

### **Addressing Problems with Water Reclamation and Reuse**

The City of Hudson Oaks is ideal for the implementation of a feasibility study, and implementation of water reuse projects to address our problems of drought and rapid population increase. Due to its relatively small size, a feasibility study will face less of the challenges associated with a larger city study. For a city the size of Hudson Oaks, a feasibility study provides a quick and cost-effective means to investigate a number of alternatives and to assess the viability of those alternatives for implementation. Logistics are a primary challenge for studies of this type. These tend to increase exponentially as study size increases. This is primarily due to the complexity of larger study areas in big cities. Study size also results in an increased number of variables. When variables are difficult to isolate and identify, the results can be compromised or more difficult to discern. Another challenge for larger studies is the bureaucracy of large city governments. This not only makes proper and thorough study difficult, but the hope for implementation of the study's findings indiscernible.

The timing is also optimal. Approximately half of the City's land is undeveloped. This presents an incredible opportunity to proactively commit to water reclamation and reuse. Bech Bruun of the Texas Water Development Board said of the North Texas water crisis, "For a growing state, nothing squanders opportunity like the lack of infrastructure."<sup>12</sup> The continuing threat of drought has informed our priorities as a community, and we have placed water conservation and efficient water use at the forefront of our planning efforts. We are confident that a feasibility study is the logical first step in developing recycled and reclaimed water infrastructure to serve our residents and businesses, and to help preserve our natural resources.

We also have the potential market. Currently 60 percent of our City's developed space is residential, and lots average three quarters of an acre. We see vast potential in using recycled water for residential irrigation, and preliminary conversations with the community have been positive. The community's view toward water reuse is substantially influenced by recent years of water shortages. Initial estimates show that 215 acre feet of recycled effluent can be returned to City customers each year for multiple uses including irrigation, fire safety, and public utility use (and up to 645 AFY at full build-out). Additionally, nearly 1,500 AFY of storm water runoff can potentially be captured and used for distribution via the proposed retention pond. The retention pond will also serve to improve storm water quality by settling suspended solids, and will mitigate localized flooding that may occur due to development. The retention pond also has the benefit of providing a natural habitat to wildlife species, preserving the natural ecosystem (providing water and flora for wildlife), retaining water that falls in the community, and providing an outdoor recreation amenity amidst a growing metropolitan region.

The City could potentially save 2,132 AFY of potable water by reusing and recycling treated effluent and local storm water. This means the City would draw less water from the Paluxy

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<sup>12</sup> Bech Bruun, "Swift: A Model for Water Infrastructure," *Texas Town & City: A Newsletter of the Texas Municipal League*, Volume CII, No. 2, February 2015, p. 20.

Aquifer -- even as the population grows -- and purchasing of Weatherford water could remain level, rather than increasing. This would mean a reduction of future draw on Lake Weatherford and Benbrook Lake, and diminished competition for resources. Recycled water infrastructure is a common-sense solution to our region's pressing water problems.

### **Addressing Climate Change**

According to the Union of Concerned Scientists, climate models unanimously project increased drought in the American Southwest, and, in fact, "The Southwest is considered one of the more sensitive regions in the world for increased risk of drought caused by climate change."<sup>13</sup> Justin Sheffield of Princeton University adds, "Recent and potential future increases in global temperatures are likely to be associated with impacts on the hydrologic cycle, including changes to precipitation and increases in extreme events such as droughts."<sup>14</sup> His research also concludes that long-term droughts are projected to become three times more common than they are today.

The City of Hudson Oaks has seen first-hand the effects of long-term drought since 2011 (Texas's driest year on record), and is taking the long-view in drought and climate-change preparation. As the risk increases for more frequent and severe droughts, moving toward self-sufficiency and securing a more reliable water supply are our goals. The Union of Concerned Scientists recommends five long-term strategies for community resilience in times of drought. With the implementation of the proposed feasibility study, the City is laying the groundwork to comply with all five recommendations: **Strategy 1. Better monitoring and measuring of water supply and uses nationwide.** While the City cannot facilitate nationwide monitoring and measuring of water supply, the proposed feasibility study will analyze existing water supply for the City of Hudson Oaks, including water usage and patterns. As stated previously, the City is implementing a centralized, automated water meter reading system and City-wide implementation of ETC's which evaluate the rate of moisture content in the soil and air, and adjust irrigation timing. **Strategy 2. Reducing indoor water use through more efficient appliances, technologies, and behaviors.** By installing a centralized "smart" water meter system, the City aims to change consumer behavior by increasing the customer's awareness of water use and associated rates. Additionally, in the City's latest budget, the City Council approved a phased approach to implementing demand-based water rate charges to alter consumer behavior. **Strategy 3. Reducing outdoor water usage through drought-tolerant landscape design and improved irrigation technologies.** As mentioned above, the City recently completed a middle median landscape project replacing all non-native plant species with native, drought-tolerant landscape. The City intends to expand implementation to include drought-tolerant landscape throughout public spaces, parks, and transportation corridors. **Strategy 4. Increasing recycling and reuse of water, including capturing and reusing storm**

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<sup>13</sup> "Causes of Drought: What's the Climate Connection?" *Union of Concerned Scientists*, [http://www.ucsusa.org/global\\_warming/science\\_and\\_impacts/impacts/causes-of-drought-climate-change-connection.html#\\_V0d91Wx0zpR](http://www.ucsusa.org/global_warming/science_and_impacts/impacts/causes-of-drought-climate-change-connection.html#_V0d91Wx0zpR), accessed on February 20, 2015.

<sup>14</sup> Sheffield, Justin, and Eric F. Wood. "Projected changes in drought occurrence under future global warming from multi-model, multi-scenario, IPCC AR4 simulations." *Climate Dynamics* 31.1 (2008): 79–105, <http://ruby.fgcu.edu/courses/twimberley/envirophilo/drought.pdf>, accessed on February 20, 2015.

**water, greywater, and wastewater.** The proposed feasibility study will allow the City to determine next steps in developing infrastructure to support recycling and reuse of wastewater and storm water runoff throughout the community. **Strategy 5. Making more strategic use of groundwater.** The proposed feasibility study will analyze the feasibility of augmenting groundwater with recycled, treated effluent and captured storm water runoff. Seventy-five percent of the City's potable water is groundwater pumped from the Paluxy Aquifer. Introducing additional supplies of water via treated effluent and storm water will allow fresh aquifer water to be used for potable water applications like drinking, cooking, and bathing, while recycled water sources can be used for irrigation and other identified uses. This will allow the City to conserve groundwater.

## 2) Water Reclamation and Reuse Opportunities

**Subcriterion 1. Describe how the feasibility study will investigate potential uses for reclaimed water (e.g., environmental restoration, fish and wildlife, groundwater recharge, municipal, domestic, industrial, agricultural).** The City anticipates that 2,132 AFY of recycled water via the proposed projects can be used for municipal and domestic uses, support of fish and wildlife habitat restoration, environmental preservation, and recreation. The consultant will investigate these potential uses by conducting interviews, holding public meetings, and analyzing and providing existing data on water reuse to the City. The City of Hudson Oaks aims to be a trend-setter in the North Texas area when it comes to water reuse, and will investigate the full range of available options for recycled and reclaimed water.

**Subcriterion 2. Describe the potential water market available to use any recycled water that might be produced upon completion of a water reuse project, as well as methods to stimulate recycled water demand and methods to eliminate obstacles for use of reclaimed water.**

The potential water market includes residents, businesses, and the City itself: **Residential.** The City is planning for full build-out within its planning area to accommodate 6,718 residents (a 350 percent population increase from current numbers). Sixty percent of the City's current developed land is residential, and we expect residents to compose a substantial portion of our reclaimed water market. **Commercial.** Interstate 20 and Highway 180 are major freeways that traverse Hudson Oaks (and provide access to the Dallas-Fort Worth area and its international airport). These two corridors are essentially the lifeblood for the community, and where the majority of expected commercial and retail development will occur. As stated previously, approximately half of the City's land is undeveloped. This amounts to approximately 1,959 acres of potential for residential and commercial expansion, which will, in turn, expand the recycled water market. **Municipal.** The City plans to lead the community by example, and utilize recycled water for public facilities (toilet and urinal flush), landscape irrigation, and fire safety. The City is also committed to preserving green space and the small-town feel of our community, and will utilize recycled water for irrigation of public parks and recreational amenities.

The City is planning now for future service needs. The City currently serves 1,197 water customers, and that number will likely triple by 2050. Preliminary meetings held with public stakeholders have garnered positive feedback regarding the use of recycled water in the community. As stated above, the intensity of the drought has “opened the eyes” of our residents and business owners, and the community is eager to secure our water future. The consultant will also incorporate marketing and outreach strategies to increase community buy-in for City consideration, including conservation awareness and recycled water benefits campaigns.

***Subcriterion 3. Describe the sources of water that will be investigated for potential reclamation, including impaired surface and ground waters.***

The sources of water that will be investigated for potential reclamation include:

***Treated effluent from the City of Hudson Oaks wastewater system.*** Currently, effluent from the City of Hudson Oaks is pumped to the City of Weatherford’s WWTP. The City would like to investigate two alternatives concerning treated effluent. First, the study will detail the feasibility of building a wastewater treatment plant in the City of Hudson Oaks. The study will also analyze the feasibility of constructing reclaimed water pipelines from the Weatherford WWTP to the City of Hudson Oaks for reuse. It is estimated that at its current population, the City of Hudson Oaks produces over 215 AFY of wastewater for potential reuse; and as the population is expected to triple by 2050, the yield could be more than 645 AFY at full build-out.

***Storm water runoff.*** The City’s topography supports a downward drainage pattern from north to south across the project area. As an important component of the proposed feasibility study, the consultant will complete the *City of Hudson Oaks 2015 Drainage Pattern Study*, which will provide data for the storm water retention pond. The study will analyze the feasibility of constructing a retention pond and accompanying purple pipe infrastructure to capture and distribute approximately 1,426 AFY of recycled storm water to customers. The consultant will investigate the feasibility of developing the retention pond as a recreational amenity to expand outdoor opportunities for residents and preserve the native ecosystem.

### **3) Description of Potential Alternatives**

***Subcriterion 1. Describe the objectives that all alternatives will be designed to meet. What other water supply alternatives will be investigated as part of the feasibility study?***

The objectives that all alternatives will be designed to meet are:

- 1) Develop alternatives that will provide a reliable water supply;
- 2) Develop alternatives that are cost-efficient;
- 3) Develop alternatives that can be accomplished in a timely manner; and
- 4) Develop alternatives that will preserve local natural waterbodies.

The feasibility study will identify alternatives for potential sources of potable and non-potable water for the City of Hudson Oaks. The alternatives will include:

**Take no action.** The consultant will analyze the feasibility of non-reuse water projects to compare against reuse projects studied. The ‘take no action’ alternatives will include an investigation of water supply via continued drilling/pumping of water from the Paluxy Aquifer; increased volume of purchased water from the City of Weatherford; and construction of infrastructure (including a review of water-rights agreements or issues necessary) to pump water from Lake Weatherford and/or Benbrook Lake.

Reuse project water supply sources include **City of Hudson Oaks treated effluent** (estimated at 215 AFY) and **captured storm water runoff** (potential yield of 1,425 AFY.)

The reuse water sources must be safe for use in irrigation and for other approved applications, according to local, state, and federal standards.

**Subcriterion 2. Provide a general description of the proposed project that will be the subject of a feasibility study.**

- 1) **Constructing a wastewater treatment plant in the City of Hudson Oaks for local treatment and reuse of effluent.** The City would like to study the feasibility of constructing a local wastewater treatment plant to facilitate water treatment and reuse. The City estimates that 215 AFY of treated effluent could be reused by residents. As the population is expected to triple by 2050, the yield could be 645 AFY at full build-out. Keeping this valuable resource close to its source will eliminate the additional steps of pumping the water to and from Weatherford for local reuse. Purple pipe infrastructure would be needed to distribute treated water throughout the City.
- 2) **Collecting and reusing storm water runoff for reuse and distribution in the community.** The proposed feasibility study will include a complete drainage pattern study for the City, and identify an optimal location for a storm water retention pond. Initial estimates show a potential collection and storage capacity of 1,426 AFY. The pond will store runoff for reuse and distribution to the community. The retention pond will improve storm water quality by settling suspended solids, and serve to alleviate localized flooding that may occur due to development. The consultant will study the feasibility of constructing purple pipe infrastructure for irrigation and other non-potable water uses from the retention pond to serve the community. The consultant will also study the feasibility of developing the pond as a natural habitat for fish and North Texas wildlife, and as a community recreation destination.
- 3) **Reusing treated effluent from the City of Weatherford’s Wastewater Treatment Plant (WWTP).** Currently, wastewater from the City of Hudson Oaks is pumped approximately six miles to be treated in the City of Weatherford. The Weatherford WWTP treats approximately 19 to 20 million gallons (61 acre feet) of Hudson Oaks’ wastewater, which is then pumped for discharge into Town Creek. The proposed study will investigate the feasibility of developing purple pipe infrastructure to return treated effluent to Hudson Oaks for multiple uses as mentioned throughout this application, including landscaping



irrigation for residential, municipal, and business uses; fire protection; and toilet and urinal flush for public facilities.

***Subcriterion 3. Describe alternative measures or technologies for water reclamation, distribution, and reuse that will be investigated as part of the feasibility study.***

The proposed project is a combined Alternatives Analysis with a Feasibility Study. Alternatives are described in Subcriteria 1 and 2, above.

#### **4) Stretching Water Supplies**

***Subcriterion 1. Describe the potential for the project to reduce, postpone, or eliminate the development of new or expanded water supplies. Include description of any specific issues that will be investigated or information that will be developed as part of the feasibility study.***

As a small community, the City of Hudson Oaks must strategically use critical financial resources to support the most beneficial long-term solutions for water efficiency. The potential for water shortages in North Texas is staggering. As mentioned earlier, Palo Pinto County, just 55 miles west of Hudson Oaks, has communities who will run out of water **in the next few weeks**. North Texas continues to be gripped by exceptional drought, and forecasts cited earlier show no sign of that trend reversing. As we head into another summer of multiple days above one hundred degrees, the thought of water is ever-present.

With the possibility of 2,132 AFY (at full build-out) of reclaimed water to augment potable water supplies, the potential to reduce, postpone, or eliminate the development of new or expanded water supplies is substantial. That amount is more than four times the amount of potable water used in the City in 2013.<sup>15</sup> If the City can successfully implement water reuse projects, it is likely that we can postpone or reduce the need to expand existing water supplies in the near future. The consultant will evaluate the water needs for the increased population (projected to peak at 6,719 residents under current geographic constraints and neighboring city boundaries), and determine the future needs for expanded or new water supplies under scenarios including water reuse projects, and scenarios that do not take water reuse projects into account.

The purpose of the feasibility study is to determine the most viable options for stretching our valuable water resources, which includes adding recycled water infrastructure to our near- and long-term planning decisions. Consider the alternative – a future with no recycled water options and continuing in a ‘business as usual’ fashion. The population of our City is expected to triple in the next three and half decades. The population of the region (currently six million) is expected to double in that same time frame. North Texas is laden with job opportunities, reasonable housing, plenty of undeveloped land, and is convenient to national and international trade routes. The broader water picture involves not only the Paluxy Aquifer, Lake Weatherford, and Benbrook Lake, but the long-time battle over resources like the Red

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<sup>15</sup> The City of Hudson Oaks pumped 160 million gallons of potable water in 2013.

River between Texas and Oklahoma (as demonstrated in the 2013 Supreme Court case between the two states for water rights). The Red River serves north Tarrant County, next door to the City of Hudson Oaks. Without innovative, new, creative solutions for a sustainable water supply, the City will be at a disadvantage in the competition for potable water. Mark Svoboda of the National Drought Mitigation Center said, “Now you have more people, you have more industry, more agriculture, more demands — for essentially the same amount of water. There’s an increased vulnerability. Even if the climate were steady, which it’s not, our vulnerability has ramped up.”<sup>16</sup>

***Subcriterion 2. Describe the potential for the project to reduce or eliminate the use of existing diversions from natural watercourses or withdrawals from aquifers. Include description of any specific issues that will be investigated or information that will be developed as part of the feasibility study.*** A priority of the proposed study is to stabilize the draw on the Paluxy Aquifer, and diminish the need to increase water purchases from the City of Weatherford, who draws water from Lake Weatherford and Benbrook Lake. Augmenting potable water with recycled water will reduce the need to draw a higher percentage of water from these sources as the population grows, and the study will investigate whether the use of recycled water can reduce the draw from these natural watercourses. Additionally, as surrounding communities continue to grow, they will pull from these natural watercourses, and the City of Hudson Oaks is determined to develop a mode of self-sufficiency that reduces dependence on these shared resources.

***Subcriterion 3. Describe the potential for the project to reduce the demand on existing Federal water supply facilities. Include description of any specific issues that will be investigated or information that will be developed as part of the feasibility study.***

The proposed study will analyze the potential to reduce future draw from Benbrook Lake, an Army Corps of Engineers federal project. Benbrook Lake supplies the Cities of Weatherford, Hudson Oaks, Willow Park, Benbrook, and Fort Worth with potable water. The Lake is also a recreation destination, and is used for fishing, boating, hunting, camping, hiking, and swimming. Benbrook Lake is one of the natural resources that growing communities in the North Texas region will share, and by augmenting 2,132 AFY of potable water, the proposed project can help balance the draw other communities will make from the Lake, and protect the resource.

## 5) Environment and Water Quality

***Subcriterion 1. Describe the potential for the project to improve the quality of surface or groundwater, including description of any specific issues that will be investigated or information that will be developed as part of the feasibility study.*** Currently, wastewater from Hudson Oaks is pumped to the City of Weatherford, treated at their facility, and then pumped for discharge into Town Creek. As part of the feasibility study, the consultant will investigate

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<sup>16</sup> Amy Slanchik, “Drought-stricken Texas and Oklahoma Battle for Red River Water Rights,” *Scripps Howard Foundation Wire*, April 12, 2013, < <http://www.shfwire.com/drought-stricken-texas-and-oklahoma-battle-red-river-water-rights/>>, Accessed on February 20, 2015.

the possibility of building our own wastewater treatment facility. We will also investigate the possibility of pumping the treated effluent back to our own city for reuse. Reusing treated wastewater will improve the quality of surface water by diverting nutrients from discharge into the Trinity River. When used for irrigation, the nutrients in the treated effluent serve to fertilize the landscaped areas, thereby providing a natural method for nutrient removal and offsetting the need for commercial fertilizers that runoff into the natural waters. As part of the feasibility study, the consultant will also develop information on groundwater recharge and environmental restoration via storm water capture with retention ponds. The use of retention ponds will provide flood protection, aesthetic features, natural habitat, and improved water quality by settling suspended solids.

Contaminated and impaired waters associated with the project that will receive the benefits noted above include:

- 1) The Paluxy aquifer has been listed as contaminated by the Texas Commission on Environmental Quality (TCEQ). The Circle Court Ground Water Plume Site is a trichloroethene (TCE) ground water plume in the Paluxy aquifer, parts of which are within the City of Hudson Oaks. The Circle Court Site was listed as final on the National Priorities List in September 2012, and the Environmental Protection Agency (EPA) has begun a Remedial Investigation.<sup>17</sup>
- 2) Additionally, the EPA lists the Clear Fork Trinity River above Lake Weatherford from the confluence with Dobbs branch to the confluence with McKnight branch as impaired due to dissolved oxygen. The Clear Fork Trinity River below Lake Weatherford two miles upstream of the South Fork Trinity River is also impaired due to dissolved oxygen.<sup>18</sup>
- 3) Finally, the Clear Fork Trinity River below Benbrook Lake from the confluence with West Fork Trinity River to one mile upstream, and the confluence with the West Fork Trinity River in Tarrant County to the Benbrook Dam in Tarrant County are impaired due to PCB(s) in fish tissue.<sup>19</sup>

***Subcriterion 2. Describe the potential for the project to improve flow conditions in a natural stream channel, including a description of any specific issues that will be investigated or information that will be developed as part of the feasibility study.*** The feasibility study will investigate the potential for reduced draw from natural stream channels of the Clear Fork Trinity River as a result of reusing treated effluent and captured storm water. The reduced draw has the potential to improve flow conditions in the natural stream channel by restoring natural stream meander and channel complexity; promoting growth of riparian vegetation, which serves as a drag on flows; reducing channelization; and increasing groundwater recharge to the stream through increased infiltration.<sup>20</sup>

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<sup>17</sup> "Basin 8: Trinity River," *Texas Commission on Environmental Quality*, <[http://www.tceq.state.tx.us/assets/public/comm\\_exec/pubs/sfr/050\\_00/vol2\\_basin08.pdf](http://www.tceq.state.tx.us/assets/public/comm_exec/pubs/sfr/050_00/vol2_basin08.pdf)

<sup>18</sup> Ibid.

<sup>19</sup> Ibid.

<sup>20</sup> "Linking Restoration Practices to Water Quality Parameters," *Environmental Protection Agency*, March 6, 2012, <

***Subcriterion 3. Describe the potential for the project to provide water or habitat for federally listed threatened or endangered species, including description of any specific issues that will be investigated or information that will be developed as part of the feasibility study.***

Maintaining stream flow is essential to habitat protection. Reusing treated effluent and captured storm water will reduce our municipal withdrawals from stream segments of the Clear Fork Trinity River (Paluxy Aquifer), Lake Weatherford, and Benbrook Lake. This will improve stream flow and preserve water and habitat for the following federally listed threatened or endangered species present in Parker County:

- The *Interior Least Tern* is federally endangered. It nests along sand and gravel bars within braided streams and rivers, and is also known to nest on man-made structures such as inland beaches, wastewater treatment plants, and gravel mines.
- The *Whooping Crane* is federally endangered. It is one of the rarest bird species in North America. Whooping Cranes migrate throughout the central portion of Texas from the eastern panhandle to the Dallas Fort Worth area and south through the Austin area to the central coast during October-November and again in April.
- The *Sharpnose Shiner* and *Smalleye Shiner* are federally endangered. These two minnows are native to the arid prairie streams of Texas and endemic to the Brazos River drainage.<sup>21</sup>

Additionally, the study will analyze the feasibility of capturing storm water runoff by constructing a retention pond. The pond will act as a habitat that mimics natural conditions to support the above-mentioned endangered and threatened species.

## **6) Legal and Institutional Requirements**

The consultant will address legal and institutional requirements including:

- The reuse of treated effluent will require a Chapter 210 Water Reuse Authorization from the Texas Commission on Environmental Quality. In addition, the construction of a purple pipe system for the distribution of the non-potable water is required for any of the proposed reuse projects. This reused water system will require the development of an Operations and Maintenance Manual for the operation of this system, and specialized operator training.
- The retention pond must be located in an area that does not collect waters that would normally discharge into receiving streams. In addition, the construction of a purple pipe system for the distribution of the non-potable water would be required. This reclaimed water system will require the development of an Operations and Maintenance Manual for the operation of this system, and specialized operator training.
- If the alternative to recycle treated wastewater from the Weatherford WWTP is selected, an interlocal agreement with the City of Weatherford will be required.

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<http://water.epa.gov/type/watersheds/archives/chap3.cfm>>, accessed on February 20, 2015.

<sup>21</sup> "Rare, Threatened, and Endangered Species in Texas by County," Texas Parks and Wildlife Department, <http://tpwd.texas.gov/gis/rtest/>>, accessed on February 20, 2015.

- If a new Hudson Oaks wastewater treatment facility is proposed, a new National Pollutant Discharge Elimination System (NPDES) permit will be required from the Texas Commission on Environmental Quality.

## 7) Renewable Energy and Energy Efficiency

Each of the three opportunities to be explored would require the use of pumps for distribution of the reclaimed, non-potable water via the purple pipe system. All pumps would be high-efficiency, variable frequency drive (VFD) pumps that use less energy than older pump models. According to the U.S. Department of Energy, pumping systems account for nearly 20% of the world's energy used by electric motors and 25% to 50% of the total electrical energy usage in certain industrial facilities.<sup>22</sup> When a pump's speed is reduced, as with VFD pumps, energy consumption tends to be directly proportional to the volume pumped, and savings of 30-50% have been achieved in many installations. A basic pump installation includes a pump motor capable of operating at one speed, consuming the amount of power required to operate at that speed. Variable speed or variable frequency drives allow electric pump motors to operate at variable speeds. ***Under lower flow demands, the motors operate at lower speeds, thus reducing power consumption compared to a motor that only has the capability of operating at one speed.*** There are other economic factors to consider other than power consumption, such as capital investment, quality, durability, and operating range. When we state that all pumps shall be high efficiency, we are stating the efficiency factor in pump selection will weigh heavily into the selection process.

Currently, wastewater from Hudson Oaks is pumped to the City of Weatherford six miles away, using valuable electricity. This amount would be reduced significantly by having a wastewater treatment site located in Hudson Oaks. Although wastewater systems are significant energy consumers, every effort would be made to employ best practices when designing, constructing, and outfitting the treatment plant. An optimal location would be chosen, thus minimizing energy expenditure for transporting water to and from the facility. Energy-efficient equipment models would be installed, and an operations and maintenance plan would be implemented to regularly evaluate the condition and performance of equipment to ensure optimal energy efficiency. Opportunities to incorporate on-site renewable energy, including solar, wind, and on-site energy production will be explored. For example, wastewater treatment plants with anaerobic digestion create on-site heat and power, by capturing biogas emissions as fuel for on-site energy generation.

Next, pipes would be routed as close as possible to the sites of reclaimed water use, in order to limit the need for additional transportation. Wastewater treatment would be tailored to meet the water quality requirements of planned reuse, thereby conserving energy by limiting the processes the water will need to undergo.

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<sup>22</sup> "Variable Speed Pumping: A Guide to Successful Applications," *U.S. Department of Energy*, Washington D.C., May 2004, <[http://www1.eere.energy.gov/manufacturing/tech\\_assistance/pdfs/variable\\_speed\\_pumping.pdf](http://www1.eere.energy.gov/manufacturing/tech_assistance/pdfs/variable_speed_pumping.pdf)>, accessed on February 25, 2015.

Construction of retention ponds linked to storage facilities for capture, treatment, and use of storm water is another option the study will explore. Construction and engineering features will be evaluated for optimal energy savings, including storm water best management practices and Low Impact Development strategies related to harvesting and treating storm water. Filtration and treatment of storm water would align with the required reuse water quality to limit unnecessary energy use.

The study will also explore the implementation of education and outreach programs within the community, such as incentives for community members, businesses, and/or industries to reduce their water usage and promote the use of reclaimed water. Working with the community to promote conservation awareness and to take actions such as installing water efficient fixtures can significantly reduce water usage and flows to the wastewater treatment plant, thereby reducing energy used for transportation and treatment of the water. Also, public education that fosters the use of reclaimed water will reduce energy consumption associated with the transport and treatment of potable water.

## **8) Watershed Perspective**

Hudson Oaks is located in the Squaw Creek-Clear Fork Trinity River Basin and the South Fork Trinity River Basin – also known as the Arlington/Benbrook/Joe Pool/Weatherford Lakes Watershed. These watersheds are part of the Trinity River, and have implications on the regional water supply, including the heavily contested water provided by the Red River to the east. As mentioned above, the purpose of the feasibility study is to determine the most viable options for stretching our valuable water resources, which includes adding recycled water infrastructure to our near- and long-term planning decisions. Stretching the local water supply, specifically by reducing draws from the Paluxy Aquifer, Lake Weatherford, and Benbrook Lake, will ease the strain on the regional water system. The strain is considerable. The population of the region (currently six million) is expected to double by 2050. The City of Fort Worth was named the fastest growing city with a population over 500,000 from 2000 to 2013. The growth shows no signs of stopping, and the vast area to the west is ripe for development. The broader water picture involves not only the Paluxy Aquifer, Lake Weatherford, and Benbrook Lake, but water supplies for all of North Texas and Oklahoma. Both states have suffered considerably from drought, and communities are scrambling to create plans for future shortages. The Red River serves north Tarrant County, next door to the City of Hudson Oaks. Without innovative, new, creative solutions for a sustainable water supply, the City will be at a disadvantage in the competition for potable water.

Our project presents an opportunity to use water that falls locally in the local community – rather than increasing our draw on far away reservoirs and supplies. By using less water from the existing watershed, we improve the ability of the watershed to recharge, support wildlife, and maintain its natural ecosystem.

## SECTION 2

### Required Permits or Approvals

A resolution confirming support for this application was presented and approved by the City of Hudson Oaks City Council on February 26, 2015, and is included in the application package. (See Section 5). The City anticipates that no additional permits or approvals will be required for the development of the feasibility study. However, the consultant will explore and confirm if any permits or approvals are required to develop the proposed study. The feasibility study will identify needed permits and approvals for proposed water-reuse projects.

## SECTION 3

### Funding Plan

The City of Hudson Oaks will contribute \$193,215 in in-kind labor, and fringe benefits. This includes \$96,000 Capital Improvement Funds for use in hiring an experienced consultant to conduct the *City of Hudson Oaks 2015 Drainage Pattern Study*. The Drainage Pattern Study is a key component in developing scenarios and understanding the feasibility of storm water capture and the implementation of a storm water retention pond for reuse. Funds are readily available for this project. The in-kind amount also includes \$24,000 in contractual costs incurred prior to the award of a grant agreement. A Letter of Commitment is included in this application stating that the engineering firm, Pacheco Koch, is paying for services from Blais & Associates to develop this grant proposal (not to exceed \$8,228). These costs will be used as in-kind match. These contractual project expenses were incurred in the development of this grant proposal (between February 6, 2015 and February 27, 2015), which assisted the City in defining the scope, cost, and specific project tasks of the feasibility study. Additionally, the in-kind contribution also includes \$39,796 in Personnel costs, \$12,480 in Fringe Benefits, and \$12,711 for Reporting by personnel. **The City's total contribution of \$193,215 is 57% of the total project costs (\$340,815).**

**Table 1 Summary of Non-Federal and Federal Funding Sources**

Funding Sources	Funding Amount
<b>Non-Federal Entities</b>	
1. Local In-Kind Contribution	*\$193,215
<b>Non-Federal Subtotal:</b>	*\$193,215
<b>Other Federal Entities</b>	
1. None	\$0
<b>Other Federal Subtotal:</b>	\$0
<b>Requested Reclamation Funding:</b>	\$147,600
<b>Total Study Funding:</b>	\$340,815

\*Denotes in-kind contributions

SECTION 4. LETTER OF COMMITMENT



February 23, 2015

Mr. Shaun Wilken  
Bureau of Reclamation  
Acquisitions Operations Group  
Mail Code: 84-27810  
P.O. Box 25007  
Denver, CO 80225

Re: Commitment Letter for City of Hudson Oaks Title XVI Feasibility Study Project

Dear Mr. Wilken:

As required by the guidelines for the WaterSMART Title XVI Reclamation and Reuse Feasibility Studies Program, this letter serves as a commitment of funding from Pacheco Koch, a civil engineering firm, toward the City of Hudson Oaks Title XVI Feasibility Study project. The City's application will be submitted to the Bureau of Reclamation on March 3, 2015.

Pacheco Koch will pay for grant-development services from the professional grant development firm Blais & Associates (not to exceed \$8,228) to develop the City of Hudson Oaks Title XVI Feasibility Study application. Please see the attached signed quote for services. The funds are ready available, and there are no time constraints on the availability of funds. There are no other contingencies associated with this funding commitment.

The City of Hudson Oaks plans to use these pre-award services as local match for the proposed project. Please do not hesitate to contact me directly should you have any questions at (817) 412-7155.

Sincerely,

A handwritten signature in black ink, appearing to read 'B. O'Neill', is written over a faint, illegible typed name.

Brian D. O'Neill, P.E., CFM  
Pacheco Koch



**RESOLUTION NO. 2015-02**

**A RESOLUTION OF THE CITY OF HUDSON OAKS, TEXAS, AUTHORIZING AND APPROVING THE APPLICATION FOR GRANT FUNDS FOR THE DEVELOPMENT OF A FEASIBILITY STUDY UNDER THE TITLE XVI WATER RECLAMATION AND REUSE PROGRAM.**

**WHEREAS**, the President of the United States and the United States Department of the Interior have provided funds for the WaterSMART Program; and

**WHEREAS**, the Bureau of Reclamation has been delegated the responsibility for the administration of this grant program, establishing necessary procedures; and

**WHEREAS**, said procedures established by the Bureau of Reclamation require a resolution certifying the approval of application(s) by the applicant's governing board before submission of said application(s); and

**WHEREAS**, the applicant, if selected, will enter into an agreement with the Bureau of Reclamation to carry out the development of the proposal.

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL THAT:**

**SECTION 1.**

Approves the filing of an application for the WaterSMART: Title XVI Water Reclamation and Reuse Program by the City of Hudson Oaks, requesting up to \$150,000 in funding support for the completion of a Feasibility Study; and

**SECTION 2.**

Appoints Patrick Lawler, the City Administrator, or his designee, to act as agent with legal authority to enter into the grant agreement, conduct all negotiations, execute and submit all documents including, but not limited to, applications, agreements, payment requests and any other grant required correspondence which may be necessary for the completion of the grant program; and

**SECTION 3.**

Certifies that the City of Hudson Oaks has sufficient funds available to provide 50% of the total project costs as matching funds/in-kind contributions; and

**SECTION 4.**

Certifies that the City Council of the City of Hudson Oaks has reviewed and supports the proposed application; and

**SECTION 5.**

Certifies that the City of Hudson Oaks will work with the Bureau of Reclamation to meet established deadlines for entering into a cooperative agreement; and


**SECTION 6.**

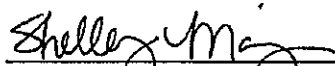
This Resolution shall take effect immediately from and after its passage and publication as required by law.

**PASSED AND APPROVED THIS 26<sup>th</sup> DAY OF FEBRUARY, 2015.**



**CITY OF HUDSON OAKS**

  
\_\_\_\_\_  
Pat Deen, Mayor

  
\_\_\_\_\_  
Shelley Major, City Secretary

## SECTION 6 Project Budget Proposal

TABLE 2						
Proposed Budget						
Budget Item Description	Computation			Recipient Funding	Reclamation Funding	Total Cost
	\$/Unit	Unit	Quantity			
<i>Salaries and Wages</i>						
Project Manager/City Administrator (16 hrs/month for 18 months)	\$ 49.91	Hour	288	\$ 14,374	\$ -	\$ 14,374
Assistant Project Manager/Assistant City Administrator (24 hrs/month for 18 months)	\$ 44.30	Hour	432	\$ 19,138		\$ 19,138
Administrative Assistant/Administrative Services Supervisor (16 hrs/month for 18 months)	\$ 21.82	Hour	288	\$ 6,284		\$ 6,284
Sub Total Salaries				\$ 39,796		\$ 39,796
<i>Fringe Benefits</i>						
Project Manager	\$ 10.59	Hour	288	\$ 3,050		\$ 3,050
Assistant Project Manager (total includes fringe benefits for hours dedicated to reporting)	\$ 9.63	Hour	648	\$ 6,240		\$ 6,240
Administrative Assistant (total includes fringe benefits for hours dedicated to reporting)	\$ 6.33	Hour	504	\$ 3,190		\$ 3,190
Subtotal Fringe				\$ 12,480		\$ 12,480
<i>Travel</i>						
Not Applicable						\$ -
<i>Equipment (per unit cost greater than \$5,000)</i>						
Not Applicable						\$ -
<i>Materials and Supplies</i>						
Not Applicable						\$ -
<i>Contractual</i>						
Pacheco Koch (Engineering & Design) - Costs from July 1, 2014 - present (120 hrs x \$200/hr)	\$24,000	Lump Sum	1	\$24,000	\$0	\$24,000
Pacheco Koch (Engineering & Design) - Estimated Future Feasibility Study Consulting Costs (41 hrs/month x \$200/hr x 18 months)	\$147,600	Lump sum	1	\$0	\$147,600	\$147,600
Pacheco Koch (Engineering & Design) - City of Hudson Oaks 2015 Drainage Pattern Study	\$96,000	Lump Sum	1	\$96,000		
Blais & Associates (Grant Development) from July1, 2014 - present	\$8,228	Lump Sum	1	\$8,228	0	\$8,228
Subtotal Contractual				\$128,228	\$147,600	\$275,828
<i>Other</i>						
Reporting (separate from personnel costs above)	\$ 12,711	Lump Sum	1	\$12,711		\$12,711
<i>Indirect</i>						
Not Applicable						\$0
<b>Total Project Costs</b>				<b>\$ 193,215</b>	<b>\$ 147,600</b>	<b>\$ 340,815</b>
<b>Percentage Contribution by Funding Source</b>				<b>57%</b>	<b>43%</b>	<b>100%</b>

## A. Budget Narrative

### 1) Salaries and Wages

The following personnel will contribute to the successful outcome of the proposed project as follows (see Table 3 below for a breakdown of hours by task for staff and consultants):

#### ***Project Manager, Patrick Lawler (City Administrator)***

288 hours (16 hours/month x 18 months) x \$49.91/hour = \$14,374

The Project Manager is the City of Hudson Oaks City Administrator. His annual salary in this capacity translates to an hourly rate of \$49.91 per hour (direct labor rate). There are no proposed salary increases during the proposed project schedule. The Project Manager will be responsible for reviewing and signing grant agreement and deliverable documents (Task 1), and reviewing and signing consultant contract documents, (Task 2). The Project Manager will review data collection efforts and assist the consultant in obtaining necessary information (Task 3). He will review and provide assistance to the consultant on their efforts to evaluate the potential reclaimed water market and project alternatives (Tasks 4 and 5). The Project Manager will oversee efforts by the consultant to develop the *City of Hudson Oaks 2015 Drainage Pattern Study* (Task 6), conceptualize reclaimed water facilities (Task 7), and plan the reclaimed water distribution system (Task 8). He will also oversee efforts to evaluate project economics (Task 9), and environmental impacts (Task 10). Similarly, he will review the consultant's efforts to develop a course of action and a draft final report (Tasks 11 and 12). Finally, the Project Manager will be responsible for reviewing and revising the final draft of the final report for reporting purposes (Task 13).

#### ***Assistant Project Manager, Chad Janicek (Assistant City Administrator)***

432 hours (24 hours/month x 18 months) x \$44.30/hour = \$19,138

The Assistant Project Manager, Chad Janicek, will provide day-to-day oversight of the work of the consultant, and assist the Project Manager in all of the activities described above (Tasks 1 – 12). Mr. Janicek is the City of Hudson Oaks Assistant City Administrator, and his direct labor rate is \$44.30 per hour. In addition to the tasks described above, the Assistant Project Manager will also review and approve invoices, ensure the project remains on schedule, and provide reports and updates to BOR staff (Task 13). Costs associated with reporting are separated, and listed under the *Reporting* section (see below).

#### ***Administrative Assistant, Joni May***

288 hours (16 hours/month x 18 months) x \$21.82/hour = \$6,284

The Administrative Assistant, Joni May, is the Administrative Services Supervisor for the City of Hudson Oaks, and her direct labor rate is \$21.82 per hour. Ms. May will provide assistance as needed throughout the project in managing the reporting contracting documentation and reporting requirements (Task 13), as well as managing the review process associated with the draft and final reports (Task 11). Costs associated with reporting are separated, and listed under the *Reporting* section (see below).

**Table 3 Division of Labor by Tasks**

Position	Prior to Award	Task Number													Total	
		1	2	3	4	5	6	7	8	9	10	11	12	13		
Project Manager Patrick Lawler (16 hours per month)		24	22	22	22	22	22	22	22	22	22	22	22	22	22	288
Asst. Project Manager Chad Janicek (36 hours per month including reporting)		50	50	50	50	50	50	50	50	50	50	50	49	49	648	
Admin Assistant Joni May (28 hours per month including reporting)		39	38	38	39	39	39	39	39	39	39	39	39	39	504	
Consultant (Grant Writing Firm)	82	0	0	0	0	0	0	0	0	0	0	0	0	0	82	
Consultant (Engineering Firm)	120	0	0	82	82	82	480	82	82	82	82	82	82	0	1,338	
<b>Total</b>	<b>202</b>	<b>113</b>	<b>110</b>	<b>192</b>	<b>192</b>	<b>193</b>	<b>591</b>	<b>193</b>	<b>193</b>	<b>193</b>	<b>193</b>	<b>193</b>	<b>192</b>	<b>110</b>	<b>2,860</b>	

**2) Fringe Benefits**

The following fringe benefit rates are fixed rates for billing purposes. They include:

Project Manager: 288 hours x \$10.59/hour = \$3,050

Assistant Project Manager: 648 hours (432 general + 216 reporting) x \$9.63/hour = \$6,240

Administrative Assistant: 504 hours (288 general + 216 reporting) x \$6.33/hour = \$3,190

Fringe benefits include retirement, insurance, health reimbursement arrangement (HRA), Medicare, unemployment, worker’s compensation, and longevity pay. **The hours listed above include hours for reporting, which is broken out to comply with the suggested budget format (see below).**

**3) Travel.** There are no travel costs associated with this project.

**4) Equipment.** There are no equipment costs associated with this project.

**5) Materials and Supplies.** There are no materials and supplies costs associated with this project.

#### **6) Contractual**

Contractual costs are as follows:

##### ***Grant Writing (Prior to Award)***

82.26 hours x \$100/hour = \$8,226

As described under Section 3 of this proposal, the City is seeking to include \$8,226 in contractual costs incurred prior to the award of a grant agreement for the development of the grant proposal. A *Letter of Commitment* is included in this application that shows that a third party (Pacheco Koch Civil Engineering) is providing funds for this task. The costs associated with this task will be used as local in-kind match.

##### ***Engineering and Design (Prior to Award)***

120 hours x \$200/hour = \$24,000

As described under Section 3 of this proposal, the City is seeking to include \$24,000 in contractual costs incurred prior to the award of a grant agreement for preliminary engineering and design. Tasks have included, but are not limited to on-site meetings and conference calls with the City to prepare for grant development; determination of the scope of the proposed feasibility study; determination of the scope for the *City of Hudson Oaks 2015 Drainage Pattern Study* (Task 6); and determination of the scope to develop a Storm Water Program Planning Utility Feasibility Study. (The Program Planning and Utility Feasibility Study is intended to develop information about the City of Hudson Oaks' future storm water program needs for system management and regulatory compliance. The study will facilitate *Task 9 - Evaluate Project Economics*). Tasks have also included development of graphics and visuals for the proposed feasibility study, review and edits to application content, and preliminary water calculations for potential reuse projects.

##### ***Task 3. Data Collection***

82 hours x \$200/hour = \$16,400

The consultant will collect and document data necessary to support their findings. The data collection effort will include, but not be limited to: Collect data regarding water use and water sources via interviews, site visits, available public data, and other means deemed necessary to support thorough investigation; Assess potable water sources; Identify reclaimed water sources; Quantify potential availability of reclaimed water; Define the proposed study, including objectives and the scope of the study; and Determine the viability and the details of an effluent reuse agreement.

**Task 4. Evaluate Reclaimed Water Market**

82 hours x \$200/hour = \$16,400

The consultant will evaluate the reclaimed water market, which will include, but not be limited to: Evaluate potential for irrigation of landscaped areas (residential, commercial, and municipal), parks, golf courses, athletic fields, and other public spaces; Evaluate potential for fire protection; Evaluate potential for toilet and urinal flush in public facilities; Quantify future demands; and Provide water quality and regulatory considerations.

**Task 5. Evaluate Alternatives**

82 hours x \$200/hour = \$16,400

The consultant will develop comprehensive scenarios evaluating alternatives to water reuse projects and compare short- and long-term results with proposed water reuse project scenarios. The consultant will consider scenarios including, but not limited to: Continued drilling/pumping of water from the Paluxy Aquifer; Increased volume of purchased water from the City of Weatherford; and Construction of infrastructure (including a review of water-rights agreements or issues necessary) to pump water from Lake Weatherford and/or Benbrook Lake.

**Task 6. Develop City of Hudson Oaks 2015 Drainage Pattern Study**

480 hours x \$200/hour = \$96,000

The drainage pattern study will analyze the storm water runoff pattern within the City of Hudson Oaks, and the consultant will utilize study findings to guide development of plans for the storm water retention pond proposed for the feasibility study. The Drainage Pattern Study will include: Perform City-wide hydrologic analysis of storm water runoff; Perform open channel and closed storm drain system hydraulic analysis; Delineate floodplains and determine natural flow patterns; and Formulate capital improvement alternatives for storm water capture and reuse.

The costs associated with this task (\$96,000) will be utilized as **local in-kind match** for the proposed feasibility study.

**Task 7. Conceptualize Reclaimed Water Facilities**

82 hours x \$200/hour = \$16,400

The consultant will design visuals of all facilities, estimate costs, and summarize findings regarding the following possible water reuse projects:

- Infrastructure to utilize treated effluent from the Weatherford WWTP. The consultant will plan pipe size and evaluate alignments to construct a recycled water line from Weatherford WWTP to Hudson Oaks;

- Storm water runoff retention pond. The consultant will plan pipe sizes and evaluate alignments for the storm water collection system. The consultant will conduct a comprehensive drainage pattern study of the City, and identify the potential site and size of the retention pond; and
- New Hudson Oaks wastewater treatment plant. The consultant will identify and evaluate sites for a local wastewater treatment plant, evaluate treatment alternatives to achieve the level of treatment needed for effluent reuse, plan pipe size, and evaluate alignments to construct a recycled water line from the new wastewater treatment plant to water customers.

**Task 8. Plan Reclaimed Water Distribution System**

82 hours x \$200/hour = \$16,400

The consultant will: Review Texas Commission on Environmental Quality (TCEQ) and other agency requirements for reclaimed water distribution infrastructure; Develop a plan for the system including conceptual design visuals and cost estimates; and Provide a phased plan for market service.

**Task 9. Evaluate Project Economics**

82 hours x \$200/hour = \$16,400

The consultant will perform a life-cycle cost analysis of all alternatives including, but not limited to costs of installation, operation and maintenance of all systems, and revenue potential. Prior to grant award, the consultant developed the scope for a Storm Water Program Planning Utility Feasibility Study. The Program Planning and Utility Feasibility Study is intended to develop information about the City of Hudson Oaks' future storm water program needs for system management and regulatory compliance. Findings from this study (including storm water management program review and analysis, storm water utility fee rate basis and fee structure development, and storm water utility fee cost/revenue projections, policies, and processes development) will accompany the above-mentioned costs to develop the comprehensive project economics analysis.

**Task 10. Evaluate Environmental Impacts**

82 hours x \$200/hour = \$16,400

The consultant will perform a Phase I Environmental Site Assessment, facilitate a preliminary jurisdictional determination for wetlands, conduct a threatened and endangered species habitat assessment, and review cultural resource protections for potential sites for all options.

**Task 11. Provide Study Results**

82 hours x \$200/hour = \$16,400



The consultant will prepare and submit for review a Draft Feasibility Study Report and Final Feasibility Study Report, as indicated below:

- The consultant will prepare a draft of the feasibility study report for review by the City of Hudson Oaks. The draft report shall include all deliverables, including potential alternatives, and the recommended course of action.
- The consultant will incorporate City edits made to the draft report to develop the final feasibility study report. The final report shall summarize the information gathered, and document the tasks completed and work performed for the project. It will include the scope of work for implementation of the project.

**Task 12. Recommend Course of Action**

82 hours x \$200/hour = \$16,400

The consultant will define the recommended course of action for implementing the findings from the feasibility study. This course of action shall include, but not be limited to the following: Reuse policies and procedures; Environmental documentation and processing; Approval and adoption of environmental documents by City Council; Regulatory processing/permitting; Financing considerations; and Phased design and construction.

**7) Reporting**

Reporting costs are estimated to be \$12,711 for this project.

The Assistant Project Manager will spend 12 hours per month for 18 months (\$44.30/hour x 12 hours x 18 months), the equivalent of \$9,569, on reporting requirements. The Administrative Assistant will spend eight hours per month for 18 months (\$21.82/hour x 8 hours x 18 months), the equivalent of \$3,142, on reporting requirements. ***Fringe rates are included in the Fringe Benefits section of the budget proposal.*** Reporting hours are additional to personnel hours in the proposed budget, and shown as a line item lump sum.

**8) Other.** There are no other expenses not included in above categories associated with this project.

**9) Indirect Costs.** There are no indirect costs associated with this project.

**10) Total Cost**

Total Study Costs: \$340,815.

Federal Share: \$147,600 (43% of the total project costs)

Non-Federal Share: \$193,215 57 %of the total project costs)

**B. Budget Form**

Attached with Federal Forms prior to Narrative

Quote Prepared by:  
 Darci Terrell  
 (405) 969-3078  
 dterrell@blaisassoc.com

# Blais & Associates

*professional grant management*

4017 Moonlight Drive  
 Little Elm, TX 75068  
 www.blaisassoc.com

## Grant Development Quote

Client Name	Pacheco Koch on behalf of the City of Hudson Oaks, Texas
Client Contact	Nicholas Nelson, Senior Project Manager, Pacheco Koch
Copy	

Grant Program / Proposal	Bureau of Reclamation Development of Feasibility Studies under the Title XVI Water Reclamation and Reuse Program for FY2015
Proposal Due	March 3, 2015, 4:00 pm MST
Project Name (if known)	To be determined
Date Prepared	February 12, 2015
Grant/Revenue Potential	\$150,000
Grant Development Cost	\$8,228.00
Cost to Develop Grant as % of Revenue Potential	5.4853%
Hourly Rate	\$100 per hour
Quote Number	02-015-001

Activity	Hours	Cost
Review Solicitation with Client, create checklist & timeline, create application template, schedule and lead kick-off call, etc.	6	\$ 600.00
Project Application Form (SF 424)	0.5	\$ 50.00
Assurances (SF 424B)	0	\$ -
Title Page and Table of Contents	0.5	\$ 50.00
Technical Proposal (limited to 20 single-spaced pages) to include executive summary, technical study description, and evaluation criteria	45	\$ 4,500.00
Required Permits and Approvals	0.5	\$ 50.00
Funding Plan	1.5	\$ 150.00
Letters of Commitment (not applicable; no funding sources other than Hudson Oaks)	0	\$ -
Resolution and Staff Report	1.5	\$ 150.00
Budget Proposal to include budget, budget narrative, and Budget Form SF 424A	5	\$ 500.00
Set-aside for up to Four (4) Conference Calls with Client staff & B&A Writing Team to Gather Required Information	4	\$ 400.00
Internal B&A Strategy Meetings, Proofreading and Quality Control	7	\$ 700.00
Incorporate Edits from Client and Format Proposal	3	\$ 300.00
Coordinate Submission of Proposal and Create Classification Folders for Permanent Record-keeping File	5	\$ 500.00
<b>SUBTOTAL</b>	<b>79.5</b>	<b>\$ 7,950.00</b>
<b>Direct Costs (charged at cost, no mark-up)</b>		
Classification Folders (3 @ \$6 each)		\$ 18.00
Reproduction (this is an electronic submission via www.grants.gov; reprographics is for the classification folders)		\$ 175.00
Direct Travel Costs for On-Site Meeting (mileage and tolls)		\$ -
Express Delivery Mail or Courier Services, if needed		\$ 85.00
<b>SUBTOTAL</b>		<b>\$ 278.00</b>
<b>TOTAL</b>	<b>79.5</b>	<b>\$ 8,228.00</b>
<b>ADD OPTIONS:</b>		
There are no additional options associated with this cost estimate.		\$ -
<b>TOTAL WITH OPTIONS</b>	<b>79.5</b>	<b>\$ 8,228.00</b>

Work performed by B&A that is outside of the scope of this estimate will be billed at \$100 per hour.  
 Please see "notes and assumptions."

Quote Prepared by:  
Darci Terrell  
(405) 969-3078  
dterrell@blaisassoc.com

# Blais & Associates

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Little Elm, TX 75068  
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Notes and Assumptions
1) B&A kindly requests a Notice to Proceed by Thursday, February 12, 2015, to enable B&A staff sufficient time to develop a solid narrative.
2) The quote assumes that the application will focus on Funding Group 1, which provides funding for up to \$150,000 for feasibility studies that can be completed within 18 months.
3) The quote assumes that the application will not include study funding from sources other than BOR or Hudson Oaks. If other sources will be included Letters of Commitment (costs not included in the quote) will be required and represent an additional cost.
4) 50% local match is required.
5) Awards are expected in September 2015.

Please note that this quote is an estimate for services based on current conditions and understandings. Many factors often change during the development of a grant application that may or may not increase the amount of labor and materials necessary to perform the services successfully. If during the course of work, B&A believes the work is taking longer than originally estimated, B&A will immediately notify the contract point of contact and either mutually agree to a change order or discuss alternatives. Additionally, B&A only charges for actual work performed. The total cost to perform the tasks may be less than quoted herein. **This is a not-to-exceed quote based upon the tasks, notes, and assumptions outlined above.**

\_\_\_\_\_  
Signature of Person Approving Costs and Authorizing Notice to Proceed

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name of Authorized Person



February 27, 2015

Mr. Shaun Wilken  
Bureau of Reclamation  
Acquisitions Operations Group  
Mail Code: 84-27810  
P.O. Box 25007  
Denver, CO 80225

Re: City of Hudson Oaks Title XVI Feasibility Study Application

Dear Mr. Wilken,

The East Parker County Chamber of Commerce (EPCC) wishes to express its full support for the water reclamation and recycling feasibility study proposed by the City of Hudson Oaks. The EPCC is a body of 462 members striving to make East Parker County a desirable place to do business. With Hudson Oaks poised for tremendous population growth in the coming years, we strongly support the City's effort to take a proactive approach to water sustainability.

As a small city located only 24 miles from the rapidly expanding metropolis of Fort Worth, Hudson Oaks has a unique opportunity to plan for infrastructure that will support a booming population and mitigate the devastating effects of North Texas's persistent drought conditions. The EPCC supports the City's desire to reduce water costs for local businesses and to advance sustainable operations. On behalf of the EPCC, I urge you to consider the City's application for feasibility study funding.

Sincerely,

A handwritten signature in cursive script that reads "Lisa L. Flowers".

Lisa L. Flowers  
President  
East Parker County Chamber of Commerce