Innovative approaches
Practical results
Outstanding service

EXHIBIT D

WASTEWATER
IMPACT FEE STUDY REPORT

Prepared for:

City of Harker Heights

January 2022

Prepared by:

FREESE AND NICHOLS, INC.
10431 Morado Circle, Suite 300
Austin, Texas 78759
512-617-3100

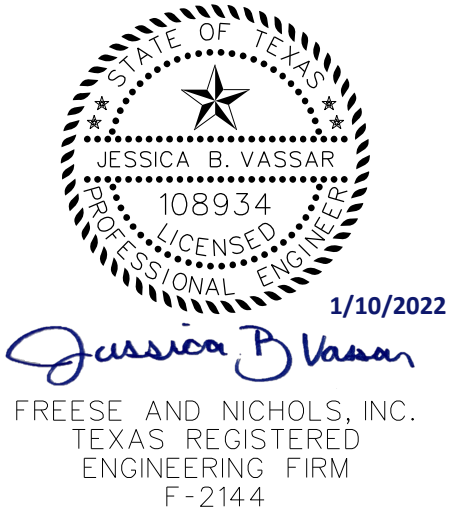
FREESE AND NICHOLS

Innovative approaches
Practical results
Outstanding service

WASTEWATER IMPACT FEE STUDY REPORT

Prepared for:

City of Harker Heights



Prepared by:

FREESE AND NICHOLS, INC.
10431 Morado Circle, Suite 300
Austin, Texas 78759
512-617-3100

FNI Project No.: HAK21373

TABLE OF CONTENTS

List of Figures

List of Tables

Appendices

1.0 EXECUTIVE SUMMARY

1.1 BACKGROUND

In April 2021, the City of Harker Heights, Texas (City) authorized Freese and Nichols, Inc. (FNI) to perform an impact fee analysis for the southeast portion of the City's wastewater system. The purpose of this report is to document the methodology used in the development and calculation of wastewater impact fees for the City of Harker Heights. The methodology used herein satisfies the requirements of the Texas Local Government Code (TLGC) Section for the establishment of impact fees. The City does not currently charge wastewater impact fees to new developments.

1.2 LAND USE ASSUMPTIONS

Population and land use assumptions are important elements in the determination of needs for infrastructure systems. To assist in the determination of need and timing of capital improvements to serve future development, a reasonable estimation of future growth is required. Growth and future development projections were formulated based on the adopted future land uses within the community. These land use assumptions, which include growth projections for the ten-year planning period of 2022-2032, are the basis for the preparation of impact fee capital improvement plan (CIP).

1.3 WASTEWATER IMPACT FEE ANALYSIS

A wastewater impact fee CIP was developed for the City of Harker Heights based on the adopted land use assumptions and previously conducted studies. The recommended improvements will provide the required capacity to meet projected wastewater flows through 2032. **Table 1-1** displays the wastewater flow projections in terms of million gallons per day (MGD) for the study area.

Table 1-1: Impact Fee Service Area Wastewater Flow Projections

Year	Average Daily Flow (MGD)	Peak Wet Weather Flow (MGD)
2022	0.03	0.11
2032	0.34	1.35

Chapter 395 of the TLGC states that the maximum impact fee may not exceed the amount determined by dividing the cost of capital improvements required by the total number of service units attributed to new

development during the impact fee eligibility period, less the credit to account for revenues used to finance these capital improvements. The total projected costs include the projected capital improvement costs to serve 10-year development, the projected finance cost for the capital improvements, and the consultant cost for preparing and updating the CIP. A 2.0% interest rate was used to calculate financing costs. **Table 1-2** displays a summary of the maximum allowable wastewater impact fee calculation.

Table 1-2: Maximum Wastewater Impact Fee Calculation

Total Eligible Capital Improvement Costs	**$15,758,705**
Total Eligible Financing Costs	$1,156,784
Total Eligible Impact Fee Costs	$16,915,489
Growth in Service Units	1,379
Maximum Wastewater Impact Fee per Service Unit (1)	$12,266
Impact Fee Credit per Service Unit (2)	$6,133
Maximum Allowable Wastewater Impact Fee per Service Unit (3)	**$6,133**

(1) Total Eligible Costs divided by the Growth in Service Units.
(2) Credit is 50% of Maximum Wastewater Impact Fee per Service Unit.
(3) Maximum Allowable Wastewater Impact Fee is Maximum Wastewater Impact Fee per service unit minus the Impact Fee Credit per Service Unit.

2.0 BACKGROUND AND SCOPE

In April 2021, the City of Harker Heights, Texas (City) authorized Freese and Nichols, Inc. (FNI) to perform an impact fee analysis for the southeast portion of the City's wastewater system. The purpose of this report is to document the land use assumptions and capital improvements plan which were used in the development and calculation of the maximum allowable wastewater impact fees for the City of Harker Heights. The methodology used herein satisfies the requirements of the Texas Local Government Code (TLGC) Section 395 (**Section 1.1**) for the establishment of impact fees. The City does not currently charge wastewater impact fees to new developments.

2.1 TEXAS LOCAL GOVERNMENT CODE

Chapter 395 of the Texas Local Government Code requires an impact fee analysis before impact fees can be created and assessed. Chapter 395 defines an impact fee as "a charge or assessment imposed by a political subdivision against new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development." In September 2001, Chapter 395 was amended creating the current procedure for implementing impact fees. Chapter 395 identifies the following items as impact fee eligible costs:

- Construction contract price
- Surveying and engineering fees
- Land acquisition costs
- Fees paid to the consultant preparing or updating the capital improvement plan (CIP) and impact fee analysis
- Projected interest charges and other finance costs for projects identified in the CIP

Chapter 395 also identifies items that impact fees cannot be used to pay for, such as:

- Construction, acquisition, or expansion of public facilities or assets other than those identified on the capital improvements plan
- Repair, operation, or maintenance of existing or new capital improvements
- Upgrading, updating, expanding, or replacing existing capital improvements to serve existing development in order to meet stricter safety, efficiency, environmental, or regulatory standards

- Upgrading, updating, expanding, or replacing existing capital improvements to provide better service to existing development
- Administrative and operating costs of the political subdivision
- Principal payments and interest or other finance charges on bonds or other indebtedness, except as allowed above

As a funding mechanism for capital improvements, impact fees allow cities to recover the costs associated with new or facility expansion in order to serve future development. Statutory requirements mandate that impact fees be based on a specific list of improvements identified in a capital improvements program and only the cost attributed (and necessitated) by new growth over a 10-year period may be considered. Once established, impact fees are required to be updated at least every five years.

2.2 METHODOLOGY

Wastewater impact fee capital improvement plan (CIP) projects were selected by FNI for the City based on the land use assumptions, input from City staff, and projects developed during previous studies. The recommended improvements will provide the required capacity to meet projected wastewater flows through year 2032. The projects identified are consistent with the Chapter 395 definition of impact fee eligible projects.

As part of the impact fee development, FNI conducted workshops with the City's appointed Capital Improvements Advisory Committee (CIAC) and City Council. FNI calculated the maximum allowable impact fee utilizing the 50% credit methodology identified in TLGC Chapter 395. The CIAC's role included reviewing the land use assumptions and impact fee CIP and recommending an impact fee rate to the City Council. The City Council sets the impact fees to be collected.

2.3 LIST OF ABBREVIATIONS

The list of abbreviations used in this report are presented in **Table 2-1.**

Table 2-1: List of Abbreviations

Abbreviation	Actual
AWWA	American Water Works Association
CIAC	Capital Improvement Advisory Committee
CIP	Capital Improvement Plan
FNI	Freese and Nichols, Inc.
MGD	Million Gallons per Day
TCE	Thonhoff Consulting Engineers, Inc.
TLGC	Texas Local Government Code

3.0 LAND USE ASSUMPTIONS

Projected land use is an important element in the analysis of wastewater collection and treatment systems. To assist the City in determining the need and timing of capital improvements to serve future development, a reasonable estimation of future growth is required. These assumptions will become the basis for the preparation of impact fee capital improvement plans for wastewater facilities.

3.1 SERVICE AREA

FNI worked with City staff to develop growth projections and land use assumptions for the study area during the development of this report. The City is anticipating the majority of future developments to occur roughly within the southeast portion of the City, and therefore determined to set the wastewater impact fee service area to this boundary, shown on **Figure 3-1**. The City recently adopted an updated future land use plan that was used for this study. The future land use for the service area is presented on **Figure 3-2**.

Harker Heights WWTP

Tonight Lift Station

VFW Lift Station

Harker Heights Lift Station

Lift Station

Thoroughbred Lift Station

Evergreen Lift Station

Warriors Path Lift Station

End-O-Trail Lift Station

Rocky Ridge Lift Station

CTE Lift Station

Osage Lift Station

McGinnis Lift Station

Wildewood Lift Station

Pueblo Lift Station

Rummel Lift Station

Fawn Valley Lift Station

Trimmier Creek Lift Station

Stillhouse Hollow Lake

Liberty Ditch

Little Nolan Creek

Capote Ditch

Hog Branch

Nolanville Tributary

Trimmier Road Ditch

Old Florence Ditch

Shoal Branch

Nolan Creek

Esther Creek

Acorn Creek

Yowell Creek

Yowell Creek TRib

Trimmier Creek

Little Trimmier Creek

Lampasas River

FIGURE 3-1
CITY OF HARKER HEIGHTS
WASTEWATER IMPACT FEE SERVICE AREA

LEGEND

- Lift Station
- Wastewater Treatment Plant
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Railroad
- Road
- River
- Lake
- Parcel
- Wastewater Service Area
- ETJ Boundary
- City Limit

FREESE AND NICHOLS

0 2,000 4,000

SCALE IN FEET

Created By Freese and Nichols, Inc.
Job No.: HAK21373
Location: H:\W_WW_PLANNING\01_DELIVERABLES\01_EXISTING_SYSTEM\Figure_1\Wastewater_Impact_Fee_Service_Area.mxd
Updated: Wednesday, May 26, 2021 1:43:23 PM
User Name: GZ818

FIGURE 3-2
CITY OF HARKER HEIGHTS
IMPACT FEE SERVICE AREA
FUTURE LAND USE

LEGEND

- Lift Station
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Railroad
- Road
- River
- Lake
- Parcel
- Wastewater Impact Fee Service Area
- ETJ Boundary
- City Limit

FUTURE LAND USE

- Community Center
- Government/Public Space
- Low Density Residential
- Medium Density Residential
- Overlook Utilization Area
- Parks & Open Space
- Regional Commercial Centers
- Residential Estate

FREESE AND NICHOLS

0 600 1,200
SCALE IN FEET

Created By Freese and Nichols, Inc.
Job No.: HAK21373
Location: H:\W_WW_7_PLANNING\01_DELIVERABLES\02_Land_Use\Figure_2-2\s-Service_Area_Land_Use.mxd
Updated: Wednesday, August 18, 2021 10:25:23 AM
User Name: JBV

3.2 HISTORICAL AND PROJECTED GROWTH

3.2.1 Historical Population

Historical population data was provided in the February 2021 *Wastewater Flow Capacity Analysis Report* developed by Thonhoff Consulting Engineers, Inc. (TCE). The City had an average 2.2% annual growth rate over the past eight years. This historical population information is presented in **Table 3-1**.

Table 3-1: Historical Population within City Limits

Year	Population	Average Annual Growth Rate (%)
2012	27,894	
2013	28,563	2.4%
2014	29,233	2.3%
2015	29,903	2.3%
2016	30,573	2.2%
2017	31,243	2.2%
2018	31,913	2.1%
2019	32,583	2.1%
2020	33,253	2.1%
Average		**2.2%**

3.2.2 Projected Growth

The magnitude and distribution of the growth in the service area will dictate where future wastewater infrastructure is required. It is important to note that projecting future growth is challenging, especially for relatively small geographic areas such as individual cities or sections of cities, because it can be difficult to predict how fast or slow development will occur when there are a variety of circumstances that can impact it. **Table 3-2** presents the City's projected growth for the 10-year planning period for the wastewater impact fee service area.

Table 3-2: Wastewater Impact Fee Service Area Growth

Year	Connections
2022	125
2032	1,500

4.0 WASTEWATER IMPACT FEE ANALYSIS

Wastewater CIP projects were developed for the City of Harker Heights in the February 2021 *Wastewater Flow Capacity Analysis Report* by TCE. The wastewater CIP projects that are required to serve growth within the next 10 years were identified for inclusion in the wastewater impact fee analysis.

4.1 WASTEWATER LOAD PROJECTIONS

Wastewater flow projections for 2022 and 2032 were developed using criteria from the February 2021 *Wastewater Flow Capacity Analysis Report*. 2.97 people per connection and 76 gallons per capita per day were assumed for wastewater flow projections A wet weather peaking factor of 4.0 was applied to calculate the peak wet weather flow. **Table 4-1** presents the projected wastewater flows for the wastewater impact fee service area in million gallons per day (MGD).

Table 4-1: Impact Fee Service Area Wastewater Flow Projections

Year	Average Daily Flow (MGD)	Peak Wet Weather Flow (MGD)
2022	0.03	0.11
2032	0.34	1.35

4.2 WASTEWATER SYSTEM IMPROVEMENTS

The TCE *2021 Wastewater Flow Capacity Analysis Report* included proposed wastewater system improvements. A summary of the costs for each of the projects required for the 10-year growth period used in the wastewater system impact fee analysis is shown in **Table 4–2**. Costs listed for the existing projects are based on actual design and construction cost data provided by the City. Detailed cost estimates for the proposed wastewater system projects were provided by TCE and are provided in **Appendix A**. **Table 4–2** shows a 2022 percent utilization, which is the portion of a project's capacity that is required to serve existing development. This portion of the project cost is not impact-fee-eligible. The 2032 percent utilization is the portion of the project's capacity that will be required to serve projected growth in the city in 2032. The 2022-2032 percent utilization is the portion of the project's capacity required to serve development from 2022 to 2032. The impact fee eligible cost for each project is calculated as the total capital cost multiplied by the 2022-2032 percent utilization. Only this portion of

the cost can be used to calculate maximum allowable impact fees. Proposed wastewater projects are shown on **Figure 4-1**.

Table 4-2: Wastewater Impact Fee Eligible Projects

No.		Description of Project	Percent Utilization			Costs Based on 2022 Dollars	
			2022[1]	2032	2022 - 2032	Capital Cost	Impact Fee Eligible Cost
Existing	A	Rummel Lift Station and Force Main	10%	100%	90%	$1,116,502	$1,004,851
	B	15/18/21/27" Gravity Line	10%	75%	65%	$1,674,752	$1,088,589
	C	Impact Fee Study	0%	100%	100%	$64,000	$64,000
	Existing Project Sub-total					**$2,855,254**	**$2,157,440**
Proposed	1	12” Force Main	0%	100%	100%	$1,975,412	$1,975,412
	2	Rummel Lift Station Expansion	0%	100%	100%	$493,853	$493,853
	3	Proposed Lift Station and 18” Force Main	0%	23%	23%	$6,330,252	$1,455,958
	4	24/27" Gravity Line	0%	23%	23%	$10,569,748	$2,431,042
	5	1.5 MGD Wastewater Treatment Plant Expansion	0%	23%	23%	$31,500,000	$7,245,000
	Proposed Project Sub-total					**$50,869,265**	**$13,601,265**
Total Capital Improvements Cost						**$53,724,519**	**$15,758,705**

(1) Utilization in 2022 on proposed projects indicates a portion of the project that will be used to address deficiencies within the existing system, and therefore are not eligible for impact fee cost recovery for future growth.

FIGURE 4-1
CITY OF HARKER HEIGHTS
WASTEWATER IMPACT FEE CAPITAL IMPROVEMENT PLAN

LEGEND

Existing Impact Fee Eligible

- Wastewater Line
- Force Main

Proposed Impact Fee Eligible

- Lift Station
- Wastewater Treatment Plant
- Force Main
- Wastewater Line

Existing Wastewater System

- Lift Station

- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Force Main
- Railroad
- Road
- River
- Lake
- Parcel
- Wastewater Impact Fee Service Area
- ETJ Boundary
- City Limit

FREESE AND NICHOLS

Harker Heights WWTP
1.5 MGD WWTP Expansion

Harker Heights Lift Station

Tonight Lift Station

VFW Lift Station

Evergreen Lift Station

CTE Lift Station

Thoroughbred Lift Station

Warriors Path Lift Station

End-O-Trail Lift Station

Rocky Ridge Lift Station

Osage Lift Station

McGinnis Lift Station

Pueblo Lift Station

Rummel Lift Station
Capacity: 720 GPM
Expand to 1,000 GPM

Fawn Valley Lift Station
Capacity: 720 GPM

Trimmier Creek Lift Station
Capacity: 2,700 GPM

18" F.M.

12" F.M.

10" F.M.

Stillhouse Hollow Lake

0 2,000 4,000
SCALE IN FEET

Created By: Freese and Nichols, Inc.
Job No.: WACO 1978
Filepath: J:\1978_PLANNING\01_DELIVERABLES\04_Impact_Fee_CIP\Figure_1\Wastewater_IF_CIP.mxd
Updated: Friday, August 13, 2021 3:40:39 PM
User Name: 03812

4.3 WASTEWATER IMPACT FEE ANALYSIS

The impact fee analysis involves determining the utilization of existing and proposed projects required as defined by the capital improvement plan to serve new development over the next 10-year period. For existing or proposed projects, the impact fee eligible cost is calculated as a percentage of the total project cost, based upon the percentage of the project's capacity required to serve development projected to occur between 2022 and 2032. Capacity serving existing development and development projected to occur more than 10 years in the future cannot be included in the maximum allowable impact fee calculations.

4.3.1 Service Units

According to Chapter 395 of the TLGC, the maximum allowable impact fee may not exceed the amount determined by dividing the cost of required capital improvements by the total number of service units attributed to new development during the impact fee eligibility period. A service unit for wastewater is defined as the service equivalent to a water connection for a single-family residence.

Public, commercial, and industrial connections are converted into service units based upon the capacity of each meter used to provide service. The number of service units required to represent each meter size is based on the safe maximum operating capacity of the appropriate meter type. American Water Works Association (AWWA) standards C700 and C710 (Displacement Meters), C715 (Ultrasonic Meters), and C702 (Compound Meters) were used to determine the safe maximum operating capacity, as these meter types represent those in place and stocked by the City. The service unit equivalent for each meter size used by the City is listed in **Table 4–3**.

Table 4-3: Service Unit Equivalents

Meter Size	Type	Maximum Flow (gpm)	Service Unit Equivalents
3/4"	Displacement	25	1.0
1"	Displacement	40	1.6
1 1/2"	Displacement	50	2.0
2"	Ultrasonic	100	4.0
3"	Compound	320	12.8
4"	Compound	500	20.0
6"	Compound	1,000	40.0
8"	Compound	1,600	64.0

Typically, in Harker Heights, single-family residences are served with 3/4-inch water meters. Larger meters represent multi-family, public, commercial, and industrial water use. **Table 4-4** shows the service units by meter size for 2022 and the projected service units for 2032.

Table 4-4: Service Units

Meter Size	2022		2032		Growth in Service Units
	Number of Meters	Service Units	Number of Meters	Service Units	
3/4"	120	120	1,489	1,489	1,369
1"	5	8	10	16	8
1 1/2"	0	0	1	2	2
2"	0	0	0	0	0
3"	0	0	0	0	0
4"	0	0	0	0	0
6"	0	0	0	0	0
8"	0	0	0	0	0
Total	**125**	**128**	**1,500**	**1,507**	**1,379**

4.3.2 Maximum Impact Fee Calculations

TLGC Chapter 395 outlines the procedures and requirements for calculating maximum allowable impact fees to recover costs associated with capital improvement projects needed due to growth over a 10-year period. Chapter 395 also requires a plan that addresses possible duplication of payments for capital improvements. This plan can either provide a credit for the portion of revenues generated by new

development that is used for the payment of eligible improvements, including payment of debt, or reduce the total eligible project costs by 50 percent. The City of Harker Heights has selected to utilize the reduction of the total eligible project costs by 50 percent to determine the maximum allowable impact fees.

Chapter 395 of the TLGC states that the maximum impact fee may not exceed the amount determined by dividing the cost of capital improvements required by the total number of service units attributed to new development during the impact fee eligibility period less the credit to account for water and wastewater revenues used to finance these capital improvements.

The total projected costs include the projected capital improvement costs to serve 10-year development, the projected finance cost for the capital improvements, and the consultant cost for preparing and updating the CIP. A 2.0% interest rate was used to calculate financing costs. **Table 4-5** displays a summary of the maximum allowable wastewater impact fee calculation.

Table 4-5: Maximum Wastewater Impact Fee Calculation

Total Eligible Capital Improvement Costs	**$15,758,705**
Total Eligible Financing Costs	$1,156,784
Total Eligible Impact Fee Costs	$16,915,489
Growth in Service Units	1,379
Maximum Wastewater Impact Fee per Service Unit (1)	$12,266
Impact Fee Credit per Service Unit (2)	$6,133
Maximum Allowable Wastewater Impact Fee per Service Unit (3)	**$6,133**

(1) Total Eligible Costs divided by the Growth in Service Units.
(2) Credit is 50% of Maximum Wastewater Impact Fee per Service Unit.
(3) Maximum Allowable Wastewater Impact Fee is Maximum Wastewater Impact Fee per Service Unit minus the Impact Fee Credit per Service Unit.

Appendix A
Cost Estimates

CITY OF HARKER HEIGHTS
Rummel Road Lift Station Upgrade
and 12-Inch Force Main Extension

Bid Opening: January 5, 2022
2:00 PM

TCE Job # 21006.1.300

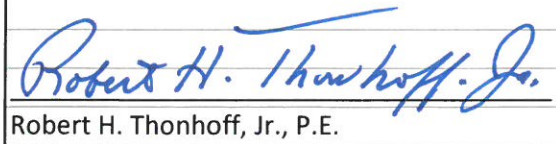
BIDDER	BASE BID AMOUNT	COMMENT
Blacknock Construction Mansfield, TX	2,469,265.00	
Bell Contractors Belton, TX	2,530,098.11	

City of Harker Heights
Phase 5 of FM 2410 Service Area Wastewater Trunk Line
and 4167 GPM Lift Station and 18-inch Force Main
Pumping Back to Existing WWTP Site

Update of Initial Engineering Estimate of Total Project Cost
December 6, 2021

Construction Costs	
Original (11/03/2009) Phase 5 Wastewater Trunk Line Construction Cost Estimate: $4,890,000	
Updated Construction Cost using ENR Index Est. 7767 (12/2021) ÷ Est. 5390 (11/2009) ≈ 1.44 x	$7,046,499
Original (5/24/2011) 4167 GPM Lift Station Construction Cost Estimate: $1,000,000	
Updated Construction Cost using ENR Index Est. 7767 (12/2021) ÷ Est. 5390 (11/2011) ≈ 1.44 x	$1,441,002
Original (5/24/2011) 18-inch F.M. Construction Cost Estimate: $1,939,800	
Updated Construction Cost using ENR Index Est. 7767 (12/2021) ÷ Est. 5390 (11/2011) ≈ 1.44 x	$2,795,255
Construction Subtotal	$11,282,756
Engineering Costs	
Turnkey Engineering Services at +/- 25%	$2,820,689
Engineering Subtotal	$2,820,689
TOTAL COST	$14,103,445
Contingency at +/- 20%	$2,796,555
UPDATE OF INITIAL ENGINEERING ESTIMATE OF TOTAL PROJECT COST	**$16,900,000**

Prepared by:
THONHOFF CONSULTING ENGINEERS, INC.



Robert H. Thonhoff, Jr., P.E.

City of Harker Heights
Wastewater Treatment Plant Expansion
From 3.0 MGD to 4.5 MGD

Initial Engineering Estimate of Total Project Cost
December 3, 2021

Construction Costs	
Renovation of Existing 3.0 MGD Facility	
3,000,000 GPD x $1/GPD	$3,000,000
Expansion of 1.5 MGD Capacity	
1,500,000 GPD x $14/GPD	$21,000,000
Construction Subtotal	$24,000,000
Engineering Costs	
Turnkey Engineering Services at +/- 25%	$6,000,000
Engineering Subtotal	$6,000,000
Total	$30,000,000
Contingency at +/- 20%	$6,000,000
INITIAL ENGINEERING ESTIMATE OF TOTAL PROJECT COST	**$36,000,000**

Prepared by:
THONHOFF CONSULTING ENGINEERS, INC.

Robert H. Thonhoff, Jr.

Robert H. Thonhoff, Jr., P.E.