



Innovative approaches
Practical results
Outstanding service

WASTEWATER IMPACT FEE STUDY REPORT

Prepared for:

City of Harker Heights

January 2024

Prepared by:

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

WASTEWATER IMPACT FEE STUDY REPORT

Prepared for:

City of Harker Heights



1/11/2024

Jessica B. Vassar

FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

Prepared by:

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

FNI Project No.: HAK23886

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY	1-1
1.1 Background	1-1
1.2 Land Use Assumptions.....	1-1
1.3 Wastewater Impact Fee Analysis.....	1-1
2.0 BACKGROUND AND SCOPE	2-1
2.1 Texas Local Government Code.....	2-1
2.2 Methodology	2-2
2.3 List of Abbreviations.....	2-3
3.0 LAND USE ASSUMPTIONS	3-1
3.1 Service Area.....	3-1
3.2 Historical and Projected Growth.....	3-4
3.2.1 Historical Population.....	3-4
3.2.2 Projected Growth.....	3-4
4.0 WASTEWATER IMPACT FEE ANALYSIS	4-1
4.1 Wastewater Load Projections	4-1
4.2 Wastewater System Improvements.....	4-1
4.3 Wastewater Impact Fee Analysis.....	4-4
4.3.1 Service Units	4-4
4.3.2 Maximum Impact Fee Calculations	4-5

List of Figures

Figure 3-1: Impact Fee Service Area	3-2
Figure 3-2: Future Land Use.....	3-3
Figure 4-1: Wastewater Impact Fee Capital Improvements Plan.....	4-3

List of Tables

Table 1-1: Impact Fee Service Area Wastewater Flow Projections.....	1-1
Table 1-2: Maximum Wastewater Impact Fee Calculation	1-2
Table 2-1: List of Abbreviations	2-3
Table 3-1: Historical Population within City Limits.....	3-4
Table 3-2: Wastewater Impact Fee Service Area Growth	3-4
Table 4-1: Impact Fee Service Area Wastewater Flow Projections.....	4-1
Table 4-2: Wastewater Impact Fee Eligible Projects	4-2
Table 4-3: Service Unit Equivalents	4-5
Table 4-4: Service Units	4-5
Table 4-5: Maximum Wastewater Impact Fee Calculation	4-6

Appendices

Appendix A: Cost Estimates

1.0 EXECUTIVE SUMMARY

1.1 BACKGROUND

In September 2023, 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 2024-2034, are the basis for the preparation of a wastewater 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 2034. **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)
2024	0.04	0.16
2034	0.32	1.28

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 3.5% 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	\$6,308,778
Total Eligible Financing Costs	\$736,902
Total Eligible Impact Fee Costs	\$7,045,679
Growth in Service Units	1,248
Maximum Wastewater Impact Fee per Service Unit ⁽¹⁾	\$5,646
Impact Fee Credit per Service Unit ⁽²⁾	\$2,823
Maximum Allowable Wastewater Impact Fee per Service Unit ⁽³⁾	\$2,822

(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 September 2023, 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 (CIP) which were used in the development and calculation of the maximum allowable wastewater impact fees for the City. The methodology used herein satisfies the requirements of the Texas Local Government Code (TLGC) Section 395 (**Section 1.1**) for the adoption of impact fees.

2.1 TEXAS LOCAL GOVERNMENT CODE

Chapter 395 of the Texas Local Government Code requires an impact fee analysis before impact fees can be assessed and collected. 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 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 infrastructure 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 the year 2034. The projects identified are consistent with the Chapter 395 definition of impact fee eligible projects.

As part of the impact fee development process, FNI conducted workshops with the City's appointed Capital Improvement 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
WCID	Water Control and Improvements District



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 are the basis for the preparation of a wastewater impact fee capital improvement plan.

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 development 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**.



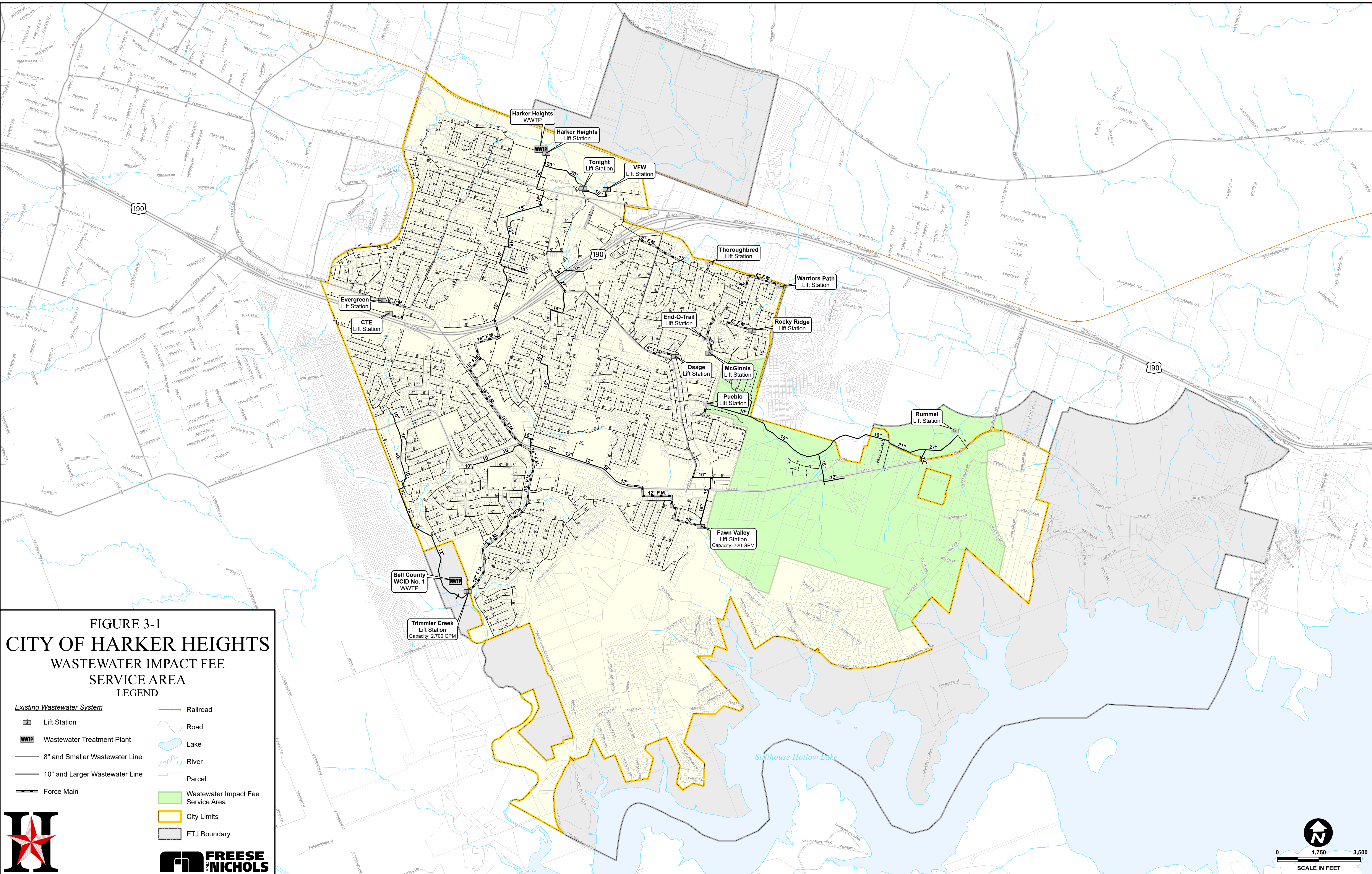
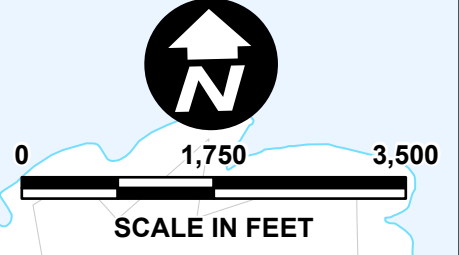
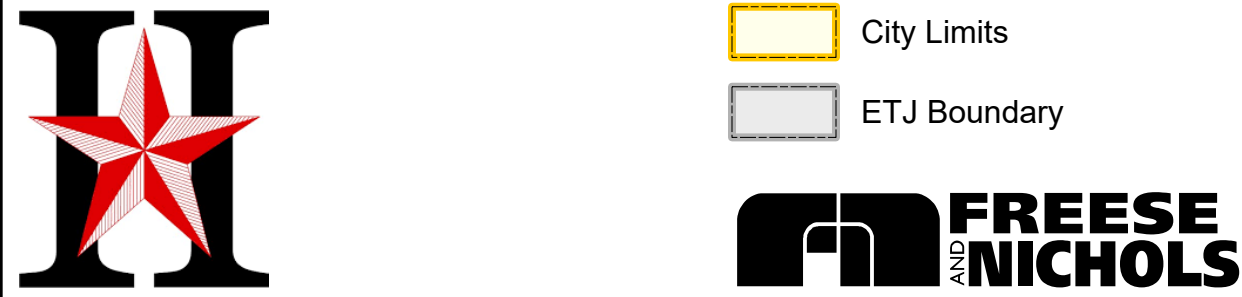


FIGURE 3-1
CITY OF HARKER HEIGHTS
WASTEWATER IMPACT FEE
SERVICE AREA
LEGEND

- Existing Wastewater System**
- Lift Station
 - Wastewater Treatment Plant
 - 8" and Smaller Wastewater Line
 - 10" and Larger Wastewater Line
 - Force Main
 - Railroad
 - Road
 - Lake
 - River
 - Parcel
 - Wastewater Impact Fee Service Area
 - City Limits
 - ETJ Boundary



Created by Freese and Nichols, Inc.
 File No. 1902099
 Location: H20_WW_PLANNING_DELIVERABLE01_WW_IF_CIP/Wastewater_IF_CIP/MapArea_IF_CIP.aprx
 Updated: Wednesday, November 02, 2022 10:19 AM
 User Name: 03166

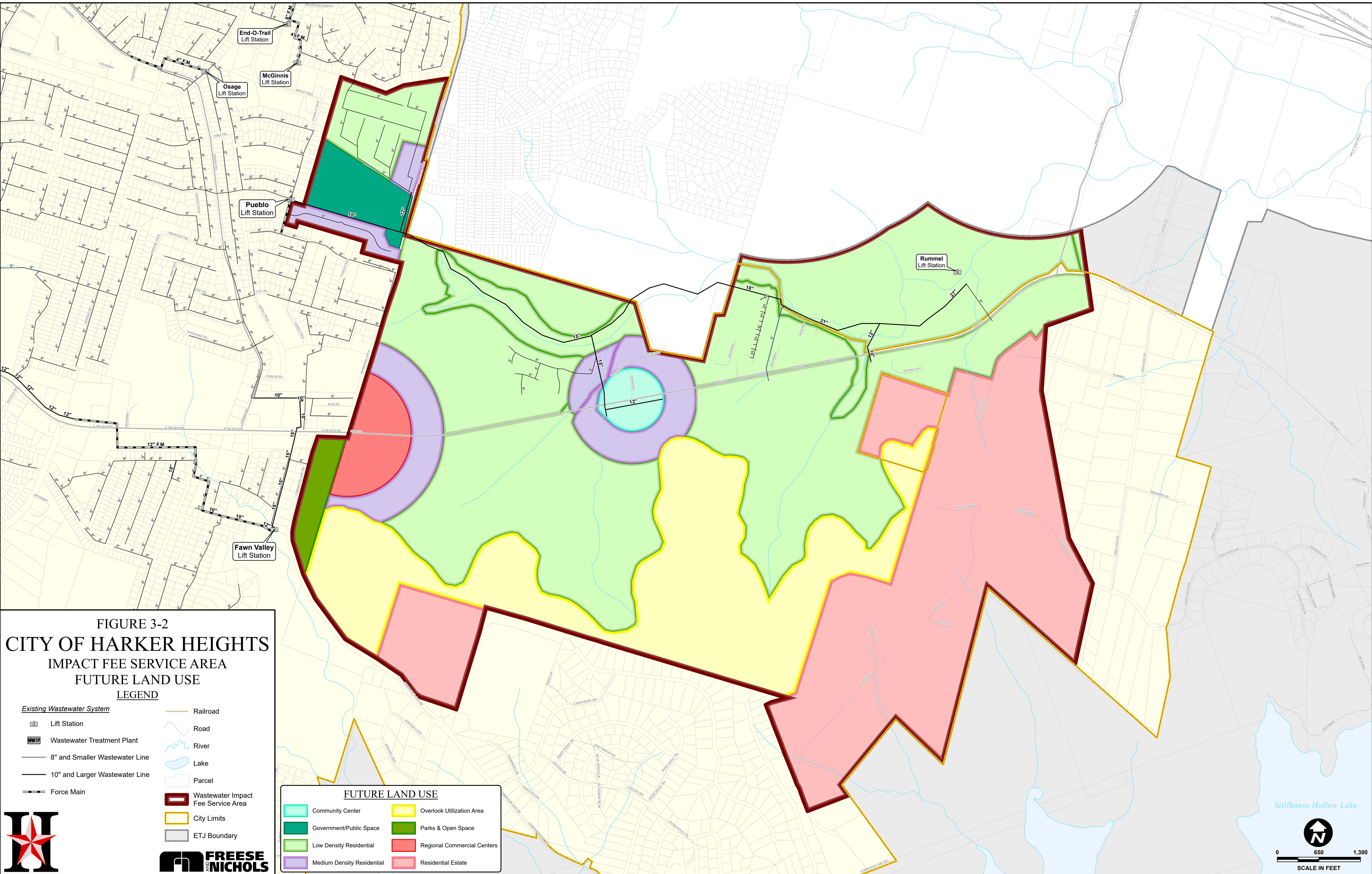


FIGURE 3-2
CITY OF HARKER HEIGHTS
 IMPACT FEE SERVICE AREA
 FUTURE LAND USE

LEGEND

Existing Wastewater System

- Lift Station
- Wastewater Treatment Plant
- 8" and Smaller Wastewater Line
- 10" and Larger Wastewater Line
- Force Main
- Railroad
- Road
- River
- Lake
- Parcel
- Wastewater Impact Fee Service Area
- City Limits
- ETJ Boundary

FUTURE LAND USE

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



Stillhouse Hollow Lake

0 650 1,300
 SCALE IN FEET

Created By Freese and Nichols, Inc.
 Date: 10/02/2022
 Location: H:\01_WW_PLANNING\01_DELIVERABLES\01_WW_IF_CIP\Wastewater_IF_CIP.aprx
 Updated: Wednesday, November 02, 2023 11:16 AM
 User Name: 08186

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 from 2012 to 2020. 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
2024	176
2034	1,420

4.0 WASTEWATER IMPACT FEE ANALYSIS

Wastewater CIP projects were developed for the City of Harker Heights by TCE and are summarized in the December 2022 *Proposed Trimmier Creek Lift Station – Bypass Relief Interceptor to WCID #1 Letter*. Cost estimates for the wastewater treatment plant were provided in the City Council Memorandum dated February 7, 2023. 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 2024 and 2034 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 average daily flow projections. A wet weather peaking factor of 4.0 was applied to calculate the projected 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)
2024	0.04	0.16
2034	0.32	1.28

4.2 WASTEWATER SYSTEM IMPROVEMENTS

The TCE 2022 *Proposed Trimmier Creek Lift Station – Bypass Relief Interceptor to WCID #1 Letter* included proposed wastewater system improvement cost estimates. The cost estimate for treatment plant capacity in Bell County WCID No. 1 wastewater treatment plant (WWTP) were provided in the City Council Memorandum dated February 7, 2023. A summary of the costs for each project 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 are provided in **Appendix A**. **Table 4-2** shows a 2024 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 2034 percent utilization is the portion of the project’s capacity that will be required to serve projected growth in the

city in 2034. The 2024-2034 percent utilization is the portion of the project’s capacity required to serve development from 2024 to 2034. The impact fee eligible cost for each project is calculated as the total capital cost multiplied by the 2024-2034 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 2024 Dollars		
		2024 ⁽¹⁾	2034	2024 - 2034	Capital Cost	Impact Fee Eligible Cost	
Existing	A	Rummel Lift Station and Force Main	15%	100%	85%	\$1,116,502	\$949,026
	B	15/18/21/27" Gravity Line	15%	70%	55%	\$1,674,752	\$921,114
	C	12-inch Force Main	0%	89%	89%	\$1,975,412	\$1,758,117
	D	Rummel Lift Station Expansion	0%	89%	89%	\$493,853	\$439,529
	E	Impact Fee Study	0%	100%	100%	\$60,200	\$60,200
	Existing Project Sub-total					\$5,320,719	\$4,127,986
Proposed	1	2 MGD at WCID No. 1	0%	14%	14%	\$13,677,083	\$1,914,792
	2	Trimmier Creek Lift Station Bypass/Relief Interceptor to WCID No. 1	0%	19%	19%	\$1,400,000	\$266,000
	Proposed Project Sub-total					\$15,077,083	\$2,180,792
Total Capital Improvements Cost					\$20,397,802	\$6,308,778	

(1) Utilization in 2024 on proposed projects indicates a portion of the project that will be used to address deficiencies within the existing system, and therefore is not eligible for impact fee cost recovery.

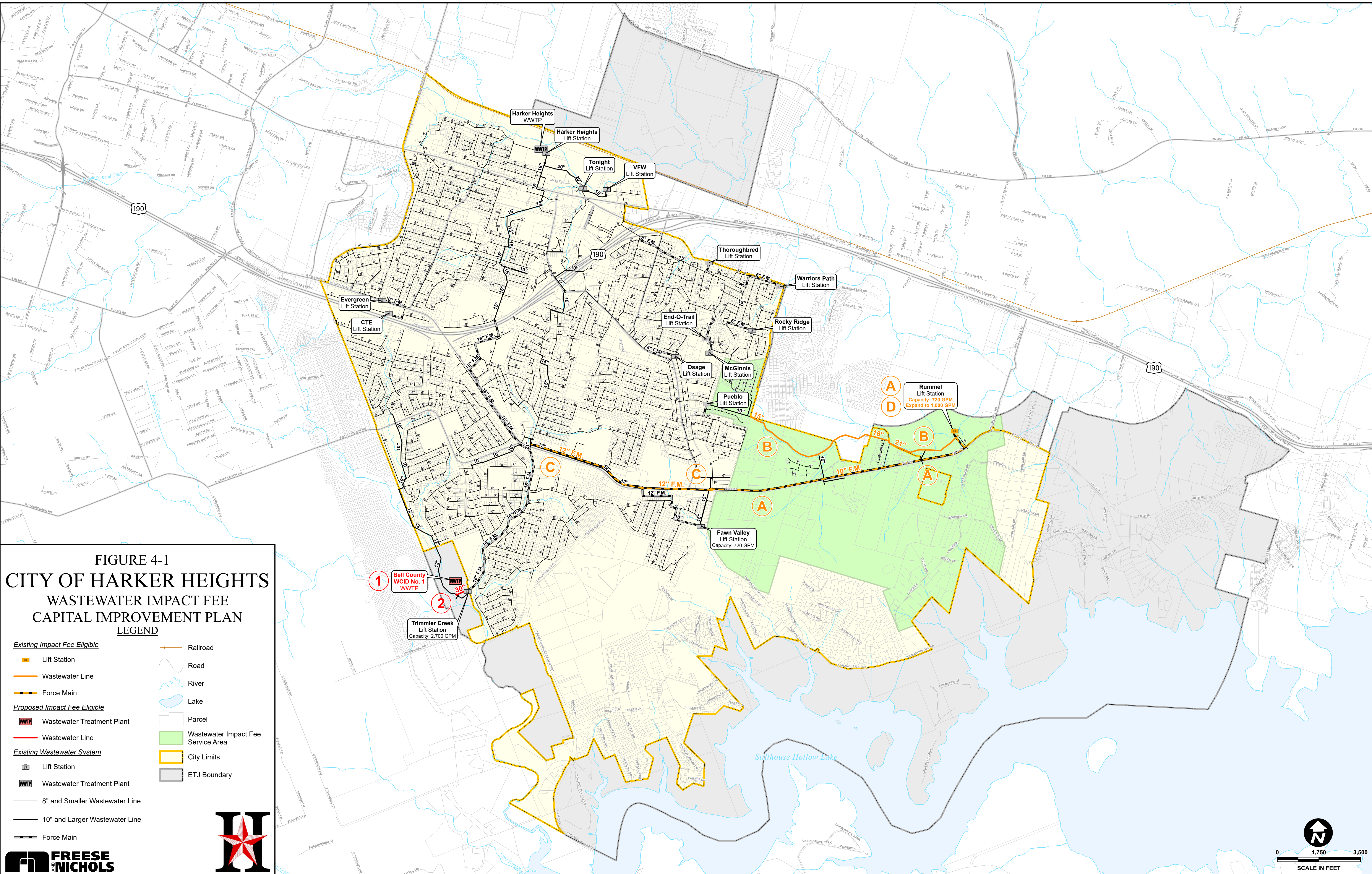


FIGURE 4-1
CITY OF HARKER HEIGHTS
WASTEWATER IMPACT FEE
CAPITAL IMPROVEMENT PLAN
LEGEND

- Existing Impact Fee Eligible**
 - Lift Station
 - Wastewater Line
 - Force Main
- Proposed Impact Fee Eligible**
 - Wastewater Treatment Plant
 - Wastewater Line
- Existing Wastewater System**
 - Lift Station
 - Wastewater Treatment Plant
 - 8" and Smaller Wastewater Line
 - 10" and Larger Wastewater Line
 - Force Main
- Other Symbols**
 - Railroad
 - Road
 - River
 - Lake
 - Parcel
 - Wastewater Impact Fee Service Area
 - City Limits
 - ETJ Boundary

Created by Freese and Nichols, Inc.
 Job No. 19420000
 Location: H120_WW_PLANNING01_DELIVERABLE01_WW_IF_CIPWastewater_IF_CIP.aprx
 Updated: Wednesday, November 02, 2022 10:09 AM
 User Name: 08186

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 2024 and 2034. 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 2024 and the projected service units for 2034.

Table 4-4: Service Units

Meter Size	2024		2034		Growth in Service Units
	Number of Meters	Service Units	Number of Meters	Service Units	
3/4"	171	171	1,409	1,409	1,238
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	176	179	1,420	1,427	1,248

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 3.5% 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	\$6,308,778
Total Eligible Financing Costs	\$736,902
Total Eligible Impact Fee Costs	\$7,045,679
Growth in Service Units	1,248
Maximum Wastewater Impact Fee per Service Unit ⁽¹⁾	\$5,646
Impact Fee Credit per Service Unit ⁽²⁾	\$2,823
Maximum Allowable Wastewater Impact Fee per Service Unit ⁽³⁾	\$2,822

(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 Council Memorandum

FROM: The Office of the City Manager

DATE: February 07, 2023

RECEIVE AND DISCUSS A PRESENTATION ON PURCHASING 2.0 MILLION GALLONS PER DAY (MGD) OF WASTEWATER TREATMENT PLANT CAPACITY FROM THE BELL COUNTY WATER CONTROL & IMPROVEMENT DISTRICT NO. 1 (WCID NO. 1) SOUTH WASTEWATER TREATMENT PLANT.

EXPLANATION:

The Texas Commission on Environmental Quality (TCEQ) requires wastewater treatment plants (WWTP's) to begin engineering for expansion when a plant reaches 75% of treatment plant capacity. When WWTP's reach 90% of treatment capacity, construction for expansion must begin.

The Harker Heights WWTP, expanded in 1991, has a design capacity of 3.0 MGD. The wastewater plant is near 75% (2.25 MGD) of treatment capacity. The existing WWTP was designed for future expansion. Thonhoff Consulting Engineers provided a probable cost estimate in the amount of \$36,000,000 for an additional 1.5 MGD of treatment plant capacity.

The WCID No. 1 has a 6.0 MGD South WWTP located off of Chaparral Road adjacent to the Harker Heights Trimmier Lift Station. The Trimmier Lift Station receives approximately 60% of the wastewater flow from the City of Harker Heights. A bypass gravity line connection could be constructed from the Trimmier Lift Station to the South WWTP. Purchasing 2.0 MGD of existing wastewater treatment plant capacity from the WCID No. 1 South WWTP would cost \$13,677,083 with approximately \$1,400,000 for the bypass gravity line connection. The WCID No. 1 Maintenance & Operation cost for treating the wastewater is currently \$1.06/1000 gallons. If the City used 2.0 MGD, the M&O cost would be \$2,120.00/day.

ACTION BY THE CITY COUNCIL:

None

ATTACHMENTS:

[NewGen Strategies & Solutions S. WWTP Buy In Calc](#)

[Existing Harker Heights Plant Upgrade 1.5 MGD Cost](#)

[Trimmier LS Bypass Interceptor to WCID South Plant-Cost](#)

Bell County WCID No. 1
Harker Heights Buy-In Calculation
Analysis Summary (As of 10/13/2022)

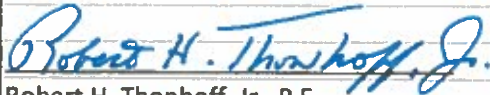
Line No	Col (A)	(B)	(C)	(D)
		Replacement Cost	Accumulated Depreciation	Net Book Value
1	RCLD Analysis	\$ 63,273,909	\$ 25,597,935	\$ 37,675,974
2	South Plant Capacity			6.00
3	Buy-in Value per MGD			\$ 6,279,329
4				
5	Existing Facility Buy-in Amounts			
6		RCLD		
7	Harker Heights MGD Buy-in per MGD	\$ 6,279,329		
8	Capacity Desired (MGD)	2.00		
9	Total Buy-in Amounts	\$ 12,558,658		
10				
11				
12	Cost of General Capital Improvements			
13			High	Low
14	General Plant Improvements (As of 2021)	\$ 2,600,000		
15	Assumed Annual Inflation Factor			
16	ENR (Mar 2021 to Mar 2022)		8.87%	
17	ENR (20 yr Average 2002 to 2022)			3.53%
18	Estimated Cost of Improvements in 2024		\$ 3,355,274	\$ 2,885,437
19	South Plant Capacity		6.00	6.00
20	Cost of Plant Improvements per MGD		\$ 559,212	\$ 480,906
21	Capacity Desired (MGD)		2.00	2.00
22	Cost of Improvements		\$ 1,118,425	\$ 961,812
23				
24				
25	Total Cost to Harker Heights			
26			High	Low
27	Cost of 2 MGD Original Plant Capacity		\$ 12,558,658	\$ 12,558,658
28	Cost of 2 MGD of Plant Improvements		1,118,425	961,812
29	Subtotal		\$ 13,677,083	\$ 13,520,470
30				

Bell County WCID No. 1
Harker Heights Buy-In Calculation
Reconstruction Cost Less Depreciation (RCLD) Calculation

Line No	Col (A) Asset Description	(B) Reconstruction Cost	(C) Accumulated Depreciation	(D) Net Book Value
1	Gator	\$ 13,642	\$ 13,642	\$ -
2	John Deere 5103 50hp 2wd Tractor	24,766	24,766	-
3	2007 Mack Truck CTP713 w/roll off hoist WW20 P3	231,775	231,775	-
4	South Wastewater Treatment Plant	42,759,484	18,435,948	24,323,536
5	SWWTP Effluent Line	6,445,081	2,778,826	3,666,255
6	25 yd Roll-Off	12,334	12,334	-
7	Security Camera-Plant 3	17,692	17,692	-
8	Effluent Vertical Turbine Pump	60,957	40,825	20,133
9	2009 Toyota Tundra WW2 P3	36,559	36,559	-
10	Effluent Pump w/ Basket Strainer	63,861	63,861	-
11	Irrigation System, landscaping	30,172	30,172	-
12	30 x 60 Tractor Shed	16,640	9,336	7,303
13	Yanmar Backhoe w/ Pallet Forks	61,852	61,852	-
14	Submersible pumps @ Infl. L/S 1 of 2	120,782	120,782	-
15	SCADA System-Plant 3	494,282	494,282	-
16	SCAG Mower-Plant 3	12,625	12,625	-
17	Building over Disc Filter	50,913	19,605	31,308
18	Oncor Service @ Sewer Plant 3	76,200	17,815	58,385
19	Sprinkler System @ STP #3 front gate	7,759	7,759	-
20	2017 Ford F550 Diesel WW27 P3	54,546	41,182	13,364
21	Tarping System for WWTP #20	8,443	8,443	-
22	2017 Kawasaki Mule	11,277	7,852	3,425
23	SBR Canopy Walls	11,312	2,622	8,690
24	Mitsubishi Forklift	59,889	24,530	35,359
25	Headworks	766,438	127,827	638,611
26	Grease Trap	2,001,189	333,760	1,667,429
27	SBR	801,996	133,757	668,238
28	Digester	2,576,804	429,761	2,147,042
29	Alum Feed	644,523	107,494	537,029
30	Outfall Box	154,902	25,835	129,067
31	Outfall Box Piping	316,404	52,770	263,634
32	Headworks Bar Screens	1,226,588	245,486	981,102
33	Grease Trap Blower	11,727	9,388	2,339
34	SBR Blowers	1,567,629	627,481	940,148
35	SBR Diffusers	537,030	429,918	107,112
36	Digester Aeration System	1,405,763	281,345	1,124,418
37	Alum Bulk Storage Tanks	62,234	24,911	37,323
38	Alum Chemical Metering System	71,924	57,579	14,345
39	Two (2) Influent L/S Pumps	204,223	163,490	40,733
40	20 YD HD Round Bottom	7,866	1,615	6,251
41	Updraded Security Cameras-Plant 3	30,437	10,293	20,144
42	Influent L/S #4 Pump	15,792	6,914	8,878
43	Panel View for SCADA	9,197	3,259	5,938
44	Service Bed for WW27 w/ Ladder Rack(#5076)	11,593	1,656	9,937
45	30 MMP Self-Priming Pump	12,809	1,601	11,208
46	2021 EXMARK 72" Lazer, E-Series, Kawasaki FX801	11,181	1,422	9,759
47	NPW Pump	30,192	2,931	27,262
48	4 Ton Nom Strght w15kw Heat	7,381	332	7,049
49	2021 F150 4x4 WWTP 32 P3	33,244	1,236	32,008
50	Submersible Lift Station Pump	72,000	789	71,211
	Subtotal	\$ 63,273,909	\$ 25,597,935	\$ 37,675,974

**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	<u>\$21,000,000</u>
Construction Subtotal	\$24,000,000
Engineering Costs	
Turnkey Engineering Services at +/- 25%	<u>\$6,000,000</u>
Engineering Subtotal	\$6,000,000
Total	\$30,000,000
Contingency at +/- 20%	<u>\$6,000,000</u>
INITIAL ENGINEERING ESTIMATE OF TOTAL PROJECT COST	\$36,000,000
Prepared by:	
THONHOFF CONSULTING ENGINEERS, INC.	
	
Robert H. Thonhoff, Jr., P.E.	



December 19, 2022

Mr. Mark Hyde
Director of Public Works
City of Harker Heights
305 Miller's Crossing
Harker Heights, Texas 76548

Re: Proposed Trimmier Creek Lift Station – Bypass Relief Interceptor to WCID #1
Engineering Estimate of Total Project Cost (REVISED)

Dear Mr. Hyde:

As per your request, I have reviewed the scope of work that may be needed to bypass and/or partially relieve the Trimmier Creek Lift Station by constructing a new "bypass/relief" wastewater interceptor to WCID #1 WWTP that could accommodate up to 2.0 MGD Average Daily Flow (ADF).

Also, as per our discussions, I have revised the scope to include a manual slide gate prior to the automatic slide gate in two locations so that the automatic slide gate may be removed for repair when required. Also, I have revised the cost estimate to utilize a 30" relief interceptor rather than the 24" interceptor as previously presented.

The Trimmier Creek Lift Station would stay in service as a "flow-equalization" pump station that could send wastewater flow either to the WCID #1 WWTP or the City of Harker Heights 3.0 MGD WWTP.

The proposed "bypass/relief" interceptor would be sized for a 2.0 MGD ADF and a minimum 6.0 MGD peak flow of 4167 gpm. This flow rate corresponds to a 24-inch wastewater interceptor laid at a minimum slope of 0.3%. However, a 30-inch interceptor is proposed to provide additional future capacity.

A flow equalization capability must be added into the Trimmier Creek Lift Station to enable it to split flows as needed between the WCID #1 WWTP and the City of Harker Heights WWTP. Initial planning of this type of capability would include a flow metering (Parshall flume) structure on the new 30-inch bypass line which regulates slide gates controlling flows entering the Trimmier Creek Lift Station off the existing 12-inch interceptor and the existing 21-inch interceptor.

A manual slide gate will be installed prior to each automatic slide gate so that the automatic slide gates may be removed for maintenance and repair.

Please note that in this scenario, the Trimmier Creek Lift Station would pump only to the City of Harker Heights WWTP, but wastewater flow would be able to bypass the lift station by gravity flow as regulated by the Parshall flume flow metering system.

Also, please note that the future FM 2410 service area main lift station is planned to convey up to 1.64 MGD ADF and 4556 gpm peak flow via a new estimated 18-inch force main. This new force main should be planned to terminate at this location to utilize the proposed infrastructure.

I have estimated a Total Project Cost for this project as follows:

Construction

12" WW Line	100 LF @ \$150/LF	=	\$ 15,000
21" WW Line	200 LF @ \$250/LF	=	50,000
30" WW Line	500 LF @ \$400/LF	=	200,000
6' Diameter Manholes	4 EA @ \$10,000/EA	=	40,000
Connections at WCID #1	1 EA @ \$50,000/EA	=	50,000
Flow Metering Vault	1 EA @ \$100,000/EA	=	100,000
Slide Gate Structure	2 EA @ \$100,000/EA	=	200,000
Slide Gate Equipment			
• 21" Auto Slide Gate	1 LS @ \$30,000	=	30,000
• 21" Manual Slide Gate	1 LS @ \$25,000	=	25,000
• 12" Auto Slide Gate	1 LS @ \$20,000	=	20,000
• 12" Manual Slide Gate	1 LS @ \$15,000	=	15,000
Slide Gate Installation	1 LS @ \$85,000	=	85,000
Electrical/SCADA	1 LS @ \$100,000/LS	=	<u>100,000</u>
	Subtotal Construction		\$ 930,000

Engineering

▪ Basic Services	\$ 140,000
▪ Design Survey	10,000
▪ Easement Acquisition	10,000
▪ Geotechnical Report	5,000
▪ Part-time RPR Services	30,000
▪ Record Drawings	<u>10,000</u>

Subtotal Engineering	\$ 205,000
Subtotal Construction and Engineering	\$1,135,000
Contingency @ +/- 25%	<u>\$ 265,000</u>
Engineering Estimate of Total Project Cost	\$1,400,000

I have attached Figure 1 which provides an "overall map" of the initial planning for this project.

Please contact me with any questions or concerns.

Sincerely yours,
THONHOFF CONSULTING ENGINEERS, INC.



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

Attachment