MIDLAND, TEXAS
WATER & WASTEWATER IMPACT FEE STUDY

February 2019

Prepared for the City of Midland

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Project Number: 01-2849-18

I. INTRODUCTION

Chapter 395 of the Texas Local Government Code describes the procedure political subdivisions must follow to create and implement impact fees. Chapter 395 defines an Impact Fee as "a charge or assessment imposed by a political subdivision against new development to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development."

The City has retained Parkhill, Smith & Cooper, Inc. to provide professional water and wastewater engineering services for the 2019 Water & Wastewater Impact Fee Study. This report includes details of the Water & Wastewater Impact Fee calculation methodology in accordance with Chapter 395, the applicable Land Use Assumptions, development of the WIF CIP, the WWIF CIP, and the Land Use Equivalency Table.

This report references two of the basic inputs to the Water & Wastewater Impact Fees:

1) **Land Use Assumptions**
2) **Capital Improvements Plans**
    a. **Water Impact Fee (WIF CIP)**
    b. **Wastewater Impact Fee (WWIF CIP)**

Information from these Land Use Assumptions and CIPs is used extensively throughout the remainder of the report.

II. LAND USE ASSUMPTIONS

A. Purpose and Overview

In order to assess an impact fee, Land Use Assumptions must be developed to provide the basis for residential and employment growth projections within a political subdivision. As defined by Chapter 395 of the Texas Local Government Code, these assumptions include a description of changes in land uses, densities, and population in the service area. The land use assumptions assist the City of Midland in determining the need and timing of capital improvements to serve future development.

The residential and non-residential estimates and projections were compiled in accordance with the following categories:

Units: Number of dwelling units, both single and multi-family.

Employment: Square feet of building area based on three (3) different classifications. Each classification has unique trip making characteristics.

Retail: Land use activities which provide for the retail sale of goods which primarily serve households and whose location choice is oriented toward the household sector, such as grocery stores and restaurants.

Service: Land use activities which provide personal and professional services, such as government and other professional offices.

Basic: Land use activities that produce goods and services such as those which are exported outside of the local economy, such as manufacturing, construction, transportation, wholesale, trade, warehousing, and other industrial uses.

The above categories are used in the development of the assumptions for impact fees; however, service unit equivalencies are based on water meter size and discussed later in the Methodology for Impact Fees.

B. Land Use Assumptions Methodology

The residential and non-residential growth projections formulated in this report were performed using reasonable and generally accepted planning principles. The following factors were considered in developing these projections:

- Character, type, density, and quantity of existing development;
- Current zoning plans;
- Future Land Use Plan;
- Growth trends;
- Location of undeveloped parcels;
- Physical restrictions (i.e. flood plains, railroads, gas wells); and
- Physical development carrying capacity of Midland.

The following was the process used to develop the land use assumptions:

Step 1: Determine Developed and Undeveloped Parcels

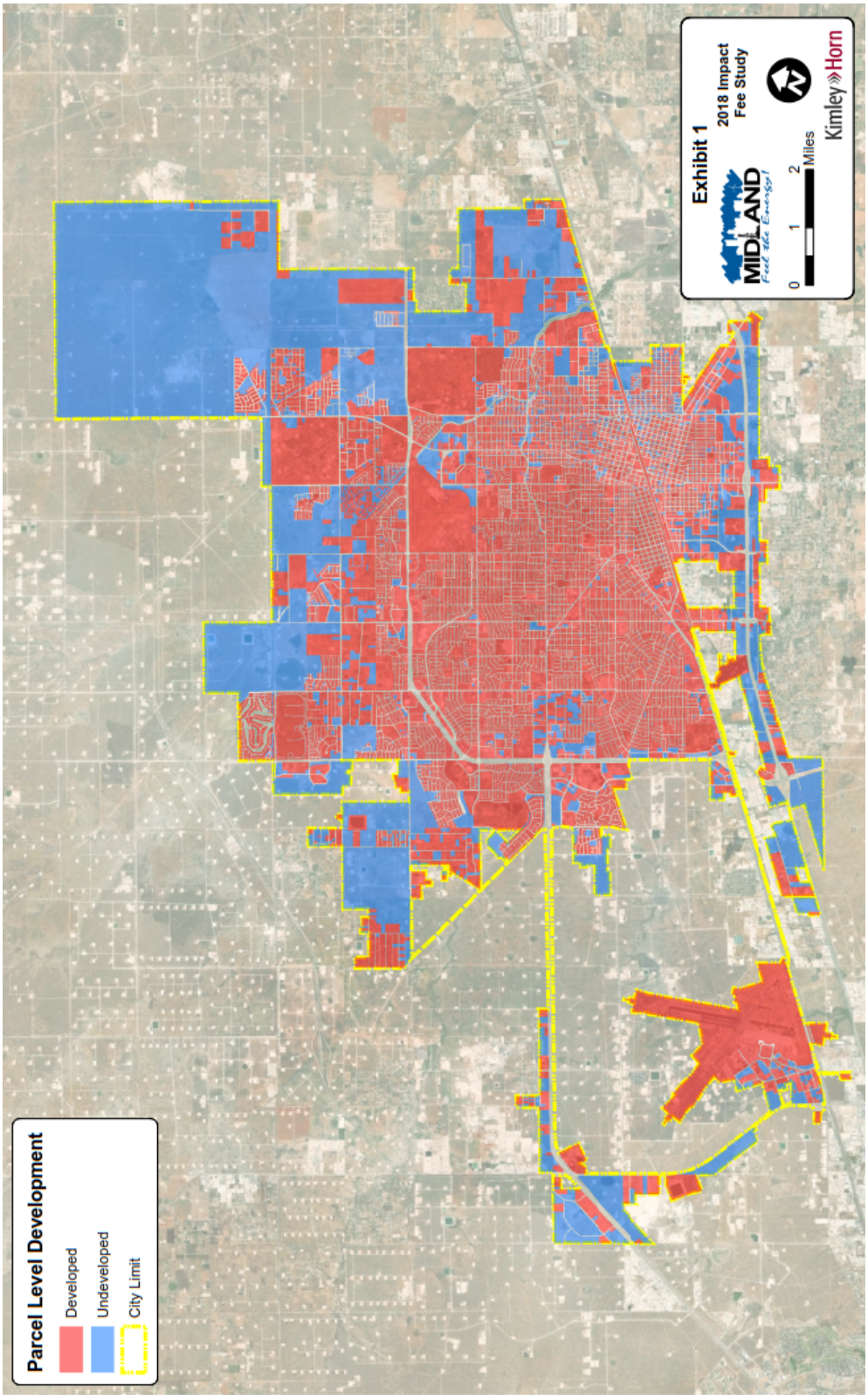
The first step was determining which parcels were developed versus undeveloped. Based on information provided by the Midland County Appraisal District and aerial survey, parcel level development was able to be estimated. **Exhibit 1** summarizes parcel development status within the City Limits.

Step 2: Determine Base Year (2018)

For the developed parcels identified in Step 1, existing residential and employment estimates were obtained using existing building information provided by the City, Midland County Appraisal District, and an aerial survey of existing development. For multifamily units, a density calculation was performed based on the building's footprint and average densities throughout the City. A conversion of square footage per unit was utilized to determine the number of units.

To estimate employment square footage, building footprint data and aerials were utilized.

Exhibit 1 – Parcel Level Development

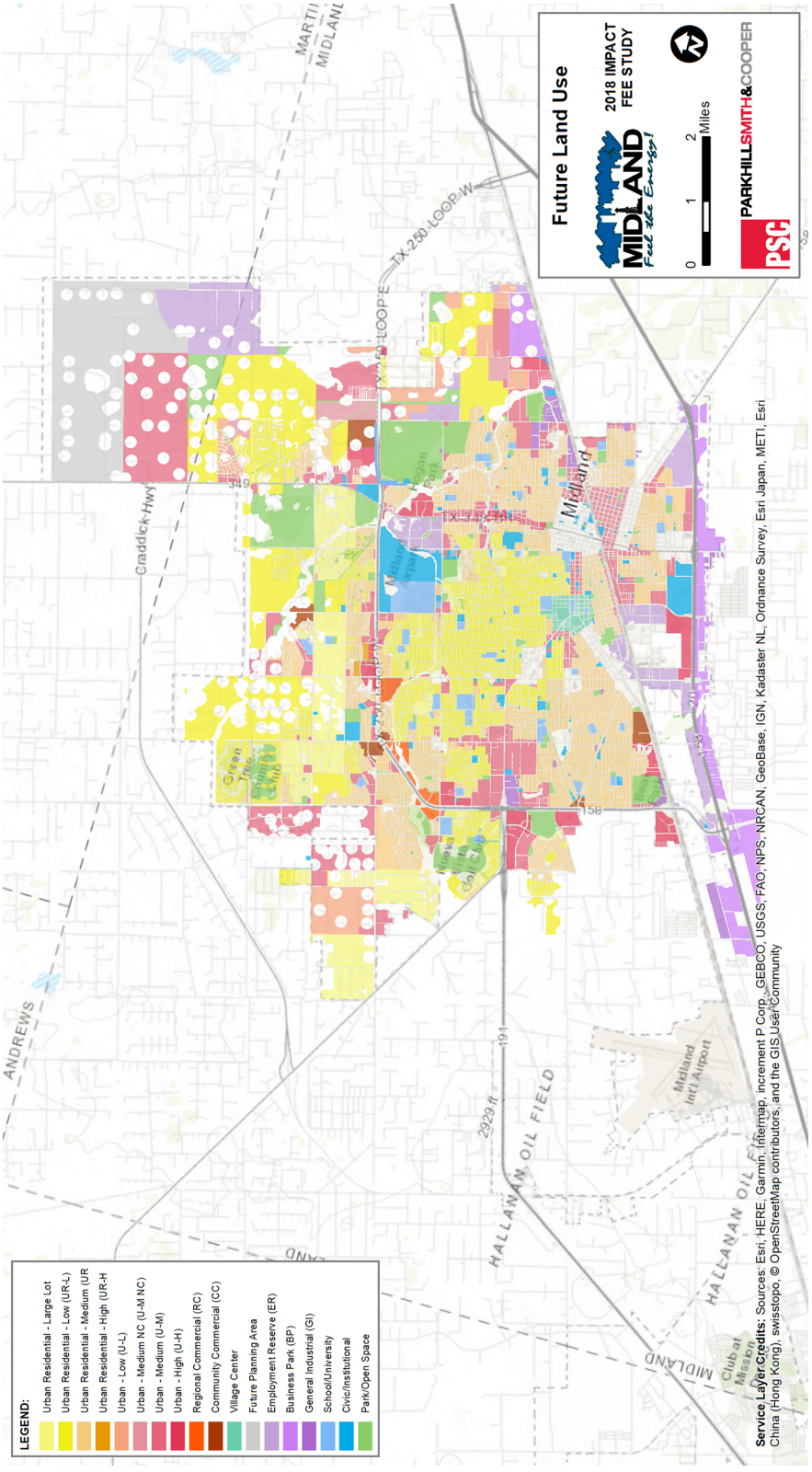


Step 3. Determine Development Carrying Capacity (Growth Potential)

For the remaining undeveloped areas, assumptions based upon the City's Future Land Use (**Exhibit 2**) from the Tall City Tomorrow Comprehensive Plan were used to estimate the carrying capacity, or growth potential, of land within the Water & Wastewater Impact Fee study area for both residential and employment land uses. The carrying capacity was calculated in two basic steps.

1) Determine the future land use for study area parcels based on previous planning efforts completed by the City.
2) Determine the amount of dwelling units and employment building space that could occupy every parcel – i.e. the parcel's "Development Carrying Capacity" – based on the future land use development types.

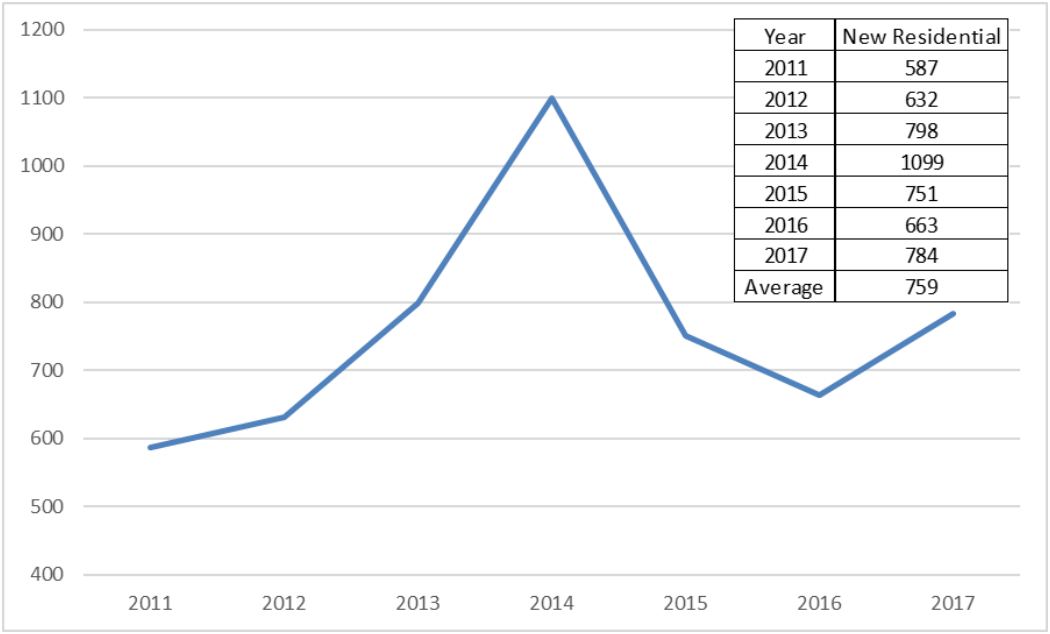
Exhibit 2 – Future Land Use Plan



Step 4. Determine 10-Year Growth Projections

As a basis for determining the 10-year growth projections, historical permit data provided by City of Midland staff was used. Using new residential permit data collected from 2011 to 2017, an average new permit per year value was found. Using the average number of new permits per year, an estimate of the number of single-family dwelling units to develop within the 10-year window was obtained. Based on the historical permit data, it was found that an average of 759 permits per year have been pulled from 2011 to 2017. With the 10-year growth assumptions, it is estimated that 7,590 single-family dwelling units will be constructed over the next 10 years. **Figure 1** summarizes the permit data from 2011 to 2017.

Figure 1 – New Residential Permit Totals (2011 – 2017)



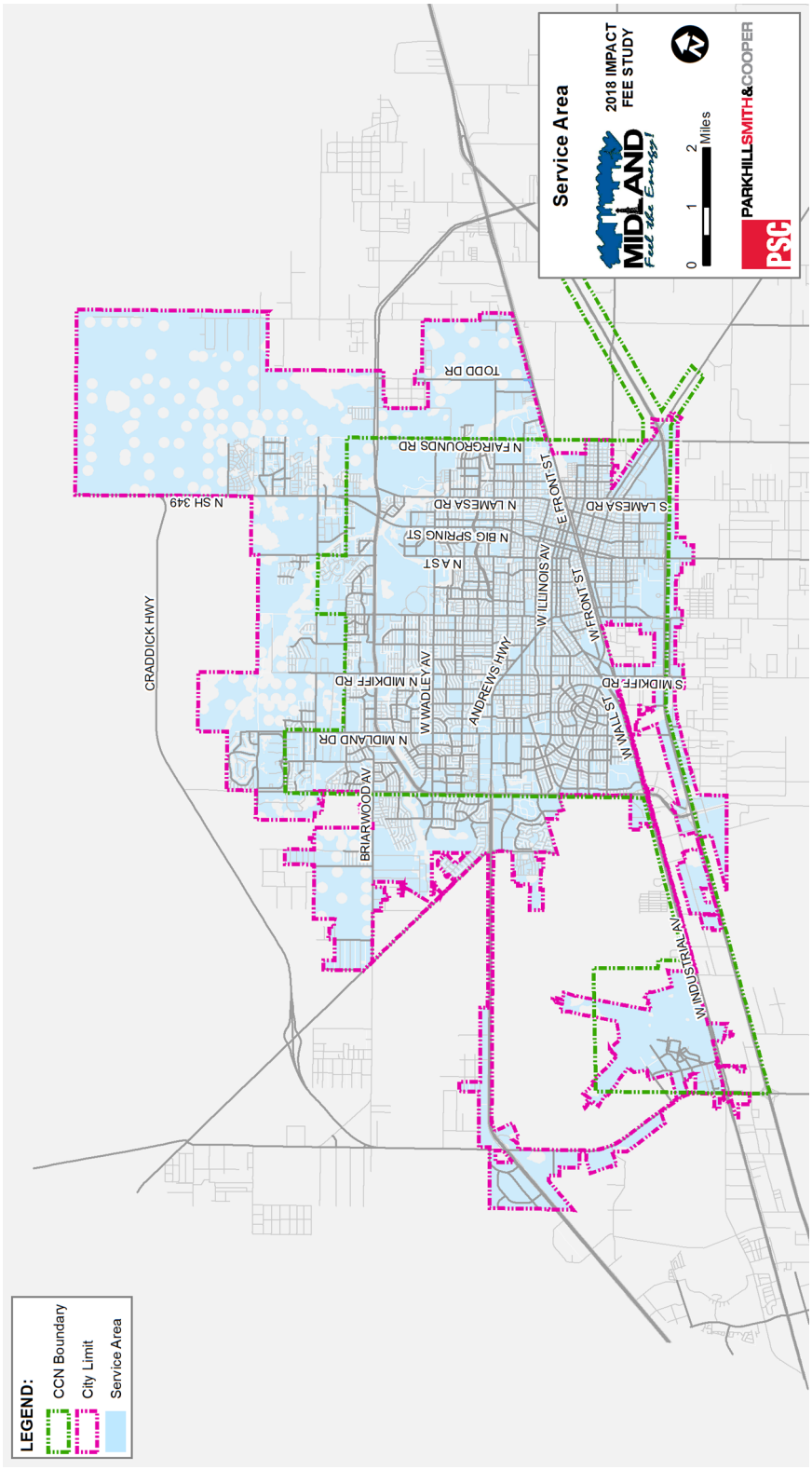
Year	New Residential
2011	587
2012	632
2013	798
2014	1099
2015	751
2016	663
2017	784
Average	759

The estimated multifamily units to develop within the 10-year window was determined using the same approach as the single-family units. The remaining growth to occur within the 10-year window for non-residential units was derived from reasonable assumptions for undeveloped areas based on growth trends and the Future Land Use Plan.

C. Water & Wastewater Impact Fee Service Area

The geographic boundary of the proposed impact fee service area for water and wastewater facilities is shown in **Exhibit 3**. The City of Midland has a distinct Certificate of Convenience and Necessity (CCN) area which includes most of the Midland City Limits. Therefore, the service area for the Water & Wastewater Impact Fee was defined as the Midland City Limits. No subdividing of the service area was deemed necessary or beneficial by the City of Midland staff and Capital Improvements Advisory Committee. For water and wastewater facilities, the service area is limited to those areas within the current corporate limits. Therefore, areas within the extraterritorial jurisdiction (ETJ) are excluded from this study.

Exhibit 3 –Service Area



D. Land Use Assumptions Summary

Table 1 summarizes the residential and employment 10-year growth projections. These values were derived based on the identification of undeveloped parcels, the City's Future Land Use Plan, historical building permit data, and input from City of Midland staff. This growth represents approximately 36% of the build out population and development potential for these areas.

Table 1. Residential and Employment 10-Year Projections

	Residential		Employment		
Roadway Service Area *	**Single Family**	**Multi-Family**	**Basic**	**Service**	**Retail**
	Dwelling Units		Sq. Ft.	Sq. Ft.	Sq. Ft.
A	2,221	845	0	983,000	753,000
B	3,876	1,642	20,000	2,384,000	987,000
C	414	1,281	685,000	3,993,000	438,000
D	1,080	735	99,000	3,062,000	355,000
Sub-Total	7,591	4,503	804,000	10,422,000	2,533,000

* Shown here for convenience from Roadway Study. Water and Wastewater Service Areas are not subdivided.

E. Water Demand Summary

Tables 2.A & 2.B summarizes the water demands resulting from the 10-year growth projections above. These values were derived based on the historical data provided by the City of Midland and requirements from TCEQ for design purposes.

Table 2.A Projected Water Demands with 10-Year Growth Projections

	Residential		Employment			Average Daily Demand
	Single-Family[1]	Multi-Family[2]	Basic[3]	Service[3]	Retail[3]	
	428 gpd/conn.	257 gpd/conn.	56 gpd/ksf	40 gpd/ksf	34 gpd/ksf	MGD
Total Daily Demand	3,248,948	1,156,370	44,702	416,880	86,882	4.95

[1] From "Table 2.12 – Demand Per Connection [2017]," *Water Distribution Analysis for City of Midland, Midland County, Texas*. Enprotec/Hibbs & Todd. August 2018

[2] Estimated Multi-Family unit demand = 60% of Single-Family unit demand.

[3] From "Table WD1. Daily water consumption in large commercial buildings, 2012" *2012 Commercial Buildings Energy Consumption Survey: Water Consumption in Large Buildings Summary*. U.S. Energy Information Administration. February 9, 2017.

Table 2.B TCEQ Water System Requirements with 10-Year Growth Projections

Equiv. Conn.	Raw Water Pump	Treatment	Covered Clearwell Volume	Ground Storage *	Pumping	Elev. Storage
	0.6 gpm/conn.	0.6 gpm/conn.	5% Daily Treatment Vol.	100 gal/conn.*	2.0 gpm/conn.	100 gal/conn.
13,375	8,025	8,025	577,820	1,337,546	26,751	1,337,546

* Excess Elevated Storage can be counted toward Ground Storage. This assumption minimizes Ground Storage requirements to 100 gal/conn.

F. Wastewater Flow Summary

Table 3 summarizes the wastewater demands resulting from the 10-year growth projections above. These values were derived based on the historical data provided by the City of Midland and requirements from TCEQ for design purposes. Only the total Average Daily Flow is calculated for wastewater purposes.

Table 3 Projected Wastewater Demands with 10-Year Growth Projections

	Residential		Employment			Average Daily Demand
	Single Family	**Multi-Family**	**Basic**	**Service**	**Retail**	
	428 gpd/conn.	257 gpd/conn.	56 gpd/ ksf	40 gpd/ksf	34 gpd/ksf	MGD
Water Totals	3,248,948	1,156,370	44,702	416,880	86,882	4.954
Wastewater Total (ADF)*	2,274,264	809,459	31,291	291,816	60,817	3.468

* ADF = Average Daily Flow = 70% of ADD

III. WATER IMPACT FEE CAPITAL IMPROVEMENTS PLAN

A recent Water Master Plan by Enprotec / Hibbs & Todd, Inc. (eHT) has been completed by the City of Midland. The purpose of this master plan was to provide the City with the ultimate plan for infrastructure to serve the City's Water Distribution System. Analysis of this plan by PSC has identified the water distribution projects needed to accommodate the projected growth within the City. Only capacity improvements still needed to build out the City's Water System to accommodate the expected growth within the next 10-years are included in the WIF CIP.

Seven general areas were identified to expand the Water Distribution System. They are as follows:

- New Elevated Storage Tank and Transmission Line to Northeast Midland
- Expansion of the East Midland Distribution System
- Expansion of the North Midland Distribution System
- Expansion of the West Midland Distribution System
- Expansion of the South Midland Distribution System
- Additional Storage Capacity
- Expanded Water Purchase from T-Bar

These proposed projects are what will be needed to serve the build out development of the service area. Projects built to serve the 10-year growth will have additional capacity built in to future growth. However, only costs associated with the 10-year growth can be used for impact fees. Because water and wastewater impact fees will be constant across the service area, the attributable cost to serve the 10-year growth is estimated to be 36%, equal to the percentage of build out development expected to occur within the next 10 years. Only the expanded water purchase from T-Bar is wholly attributable to the 10-year growth. These impact fee capital improvements are shown in Table 4 and illustrated in Exhibit 4. The WIF CIP was developed in conjunction with input from City of Midland staff and represents projects that will be needed to accommodate the growth projected in the Land Use Assumptions section of this report.

Table 4.A. 10-Year Water Impact Fee Capital Improvements Plan – Summary

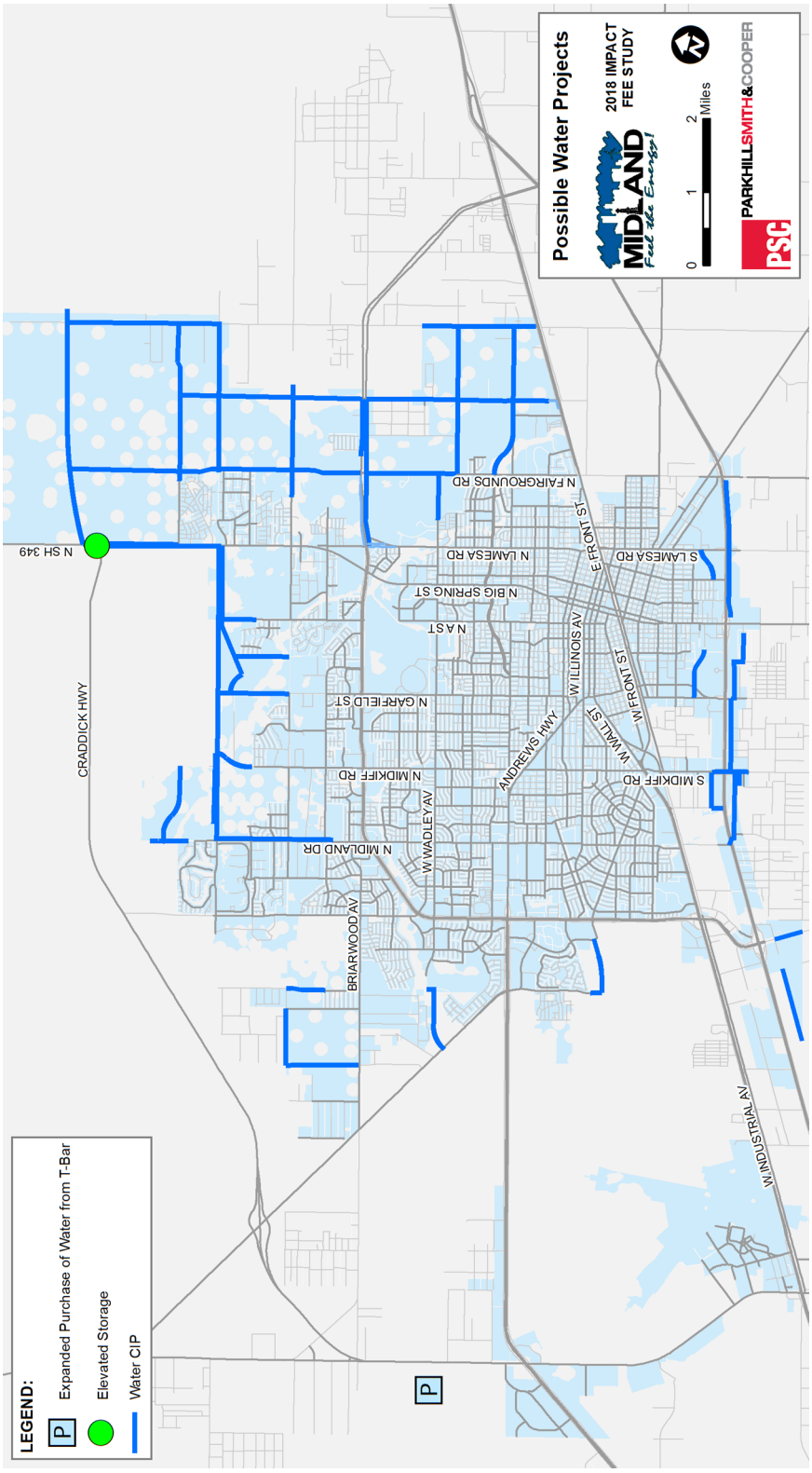
Cost Allocation for Water Impact Fee Calculation				
Project #	Description of Project	2018 Percent Utilization	2028 Percent Utilization	2018-2028 Percent Utilization
1	New Elevated Storage Tank and Transmission Line to NE Midland	0%	36%	36%
	OPC Projects: A34, B28			
2	Expansion of East Midland Distribution System	0%	36%	36%
	OPC Projects: B2,3,8,9,10,11,19,20,21,22,23,24,29,30,31,32,33,34,35,36,37, D4,5,6,7,15,16,17			
3	Expansion of North Midland Distribution System	0%	36%	36%
	OPC Projects: A1,2,28,29,30,31,32, B4,5,6,14			
4	Expansion of West Midland Distribution System	0%	36%	36%
	OPC Projects: A3,4,20,22, C30,32,33			
5	Expansion of South Midland Distribution System	0%	36%	36%
	OPC Projects: C5,6,7,8,9,10,11,12,13,14,21,23,24, D9,11,21,22,23			
6	Storage Capacity	0%	36%	36%
	OPC Projects: E2,3			
7	Expanded Water Purchase from T-Bar	0%	100%	100%
	OPC Projects: E1			

Note: The 10-Year Water Impact Fee CIP is not in a prioritized order.

Table 4.B. 10-Year Water Impact Fee Capital Improvements Plan - Detail

Cost Allocation for Water Impact Fee Calculation				
Project #	Description of Project	2018 Percent Utilization	2028 Percent Utilization	2018-2028 Percent Utilization
A1	12" WL - Future Oxy Parkway - Midland Dr to Midkiff	0%	36%	36%
A2	16" WL - Future GT Blvd - Midland Dr to Midkiff	0%	36%	36%
A3	16" WL - Future Mockingbird Ln - CR1250 to CR 1244	0%	36%	36%
A4	16" WL - Future Mockingbird Ln - CR1244 to Golden Gate	0%	36%	36%
A20	16" WL - Future CR1250 - Briarwood to Mockingbird	0%	36%	36%
A22	12" WL - Avalon Dr - CR56 to Mockingbird	0%	36%	36%
A28	12" WL - Midland Dr - Oxy Prkwy to City Limits	0%	36%	36%
A29	12" WL - Midland Dr - Green Tree North to Oxy Prkwy	0%	36%	36%
A30	12" WL - Midland Dr - Sunrise Ct to Green Tree North	0%	36%	36%
A31	12" WL - Midkiff Rd - Fairfield to GT Blvd	0%	36%	36%
A32	16" WL - Garfield St - Mockingbird to GR Blvd	0%	36%	36%
A34	24" WL - WPP to Garfield	0%	36%	36%
B2	16" WL - Oxy Parkway - Fairgrounds to Todd	0%	36%	36%
B3	16" WL - Oxy Parkway - Todd to Elkins	0%	36%	36%
B4	16" WL - Future Passage Way - Garfield to CRMWD Esmnt	0%	36%	36%
B5	16" WL - CRMWD Easement - Passage Way to Big Spring	0%	36%	36%
B6	12" WL - Future Collector in Woodland Park - Mockingbird to CRMWD	0%	36%	36%
B8	12" WL - Future Mockingbird Ln - West of Fairgrounds to Todd	0%	36%	36%
B9	12" WL - Future Wadley - Ranchland Dr to Fairgrounds	0%	36%	36%
B10	12" WL - CR 72 - Fairgrounds to Cynthia	0%	36%	36%
B11	12" WL - CR 72 - Cynthia to Elkins	0%	36%	36%
B14	16" WL - A St - Keystone to GT Blvd	0%	36%	36%
B19	16" WL - Fairgrounds - Loop 250 to Craddick Hwy	0%	36%	36%
B20	16" WL - Todd Rd - Loop 250 to Oxy Prkwy	0%	36%	36%
B21	12" WL - Todd Rd - City Limits to Loop 250	0%	36%	36%
B22	12" WL - Todd Rd - CR 72 to Marie Dr	0%	36%	36%
B23	8" WL - Elkins Rd - CR 72 to City Limits	0%	36%	36%
B24	16" WL - Craddick Hwy - Big Spring to Elkins	0%	36%	36%
B28	24" WL - Garfield to EST (EA1)	0%	36%	36%
B29	16" WL - Big Spring - EST (EA1) to Craddick Hwy	0%	36%	36%
B30	12" WL - Fairgrounds - CR 72 to Loop 250	0%	36%	36%
B31	16" WL - Loop 250 (north side) - Sunset Ridge to Todd	0%	36%	36%
B32	12" WL - Todd Rd - Marie Dr to City Limits	0%	36%	36%
B33	12" WL - Loop 250 (south side) - Lamesa to Fairgrounds	0%	36%	36%
B34	16" WL - Loop 250 (south side) - Fairgrounds to Todd	0%	36%	36%
B35	16" WL - Elkins Rd - Oxy Prkwy to Craddick Hwy	0%	36%	36%
B36	16" WL - GT Blvd & Elkins Rd - Todd to Oxy Prkwy	0%	36%	36%
B37	16" WL - GT Blvd - Fairgrounds to Todd	0%	36%	36%
C5	12" WL - Future Harris Rd - Cotton Flat to Garfield	0%	36%	36%
C7	8" WL - Future N Backage Rd - Warehouse Rd to City Limits	0%	36%	36%
C8	8" WL - Future N Backage Rd - City Limits to Midkiff	0%	36%	36%
C9	12" WL - Sunglo - Midkiff to Garfield	0%	36%	36%
C10	8" WL - CR 111 - I-20 to Jasmine	0%	36%	36%
C11	8" WL - Jasmine - CR111 to E of CR1220	0%	36%	36%
C12	8" WL - Jasmine - East of CR1220 to Midkiff	0%	36%	36%
C13	8" WL - N of CR 113 - City Limits to Midkiff	0%	36%	36%
C14	12" WL - Cholla Rd - Future Acacia to City Limits	0%	36%	36%
C21	8" WL - Antelope Trail - Cholla to City Limits	0%	36%	36%
C23	8" WL - Warehouse Dr - Loop 250 to N Backage Road	0%	36%	36%
C24	12" WL - Midkiff Rd - City Limits to N Backage Road	0%	36%	36%
C30	12" WL - Future Wadley - SH 158 to Avalon Ext.	0%	36%	36%
C32	16" WL - Future Avalon - Mile High Ln to Thomason	0%	36%	36%
C33	16" WL - Future Thomason - Avalon to Tradewinds	0%	36%	36%
D4	12" WL - Future Scharbauer Dr - Fairgrounds to Golf Course Road	0%	36%	36%
D5	12" WL - Golf Course Road - Future Scharbauer to Todd	0%	36%	36%
D6	12" WL - Golf Course Road - Todd to Evans	0%	36%	36%
D7	12" WL - Golf Course Road - Evans to Elkins	0%	36%	36%
D9	12" WL - Future Harris Rd - Garfield to Wolcott	0%	36%	36%
D11	12" WL - Future Longview - Terrell to Lamesa	0%	36%	36%
D15	12" WL - Todd - BI20 to CR72	0%	36%	36%
D16	12" WL - Elkins - Golf Course Road to CR72	0%	36%	36%
D17	12" WL - Elkins - BI20 to Golf Course Road	0%	36%	36%
D21	12" WL - I-20 (south side) - Big Spring to Lamesa	0%	36%	36%
D22	12" WL - I-20 (south side) - Lamesa to Fairgrounds	0%	36%	36%
D23	12" WL - Dayton Rd - Garfield to Big Spring	0%	36%	36%
E1	Raw Water Supply	0%	100%	100%
E2	Elevated Storage	0%	36%	36%
E3	Ground Storage	0%	36%	36%

Exhibit 4 – Water Impact Fee Capital Improvements Plan



IV. WASTEWATER IMPACT FEE CAPITAL IMPROVEMENTS PLAN

A Wastewater Master Plan is currently underway by Enprotec / Hibbs & Todd, Inc. (eHT) as authorized by the City of Midland. The purpose of this master plan will be to provide the City with the ultimate plan for infrastructure to serve the City's Wastewater Collection System. Since this plan is not complete, PSC utilized older existing modeling for the City's wastewater collection system and analyzed this for projects needed to accommodate the projected growth within the City. Only capacity improvements still needed to build out the City's Wastewater System to accommodate the expected growth within the next 10-years are included in the WWIF CIP.

Five general areas were identified to expand the Wastewater Collection System. They are as follows:

- New East Sewershed Trunk Lines
- Expansion of the Midland Draw Trunk System
- Expansion of the Jal Draw Trunk System
- Expansion of the South Trunk System
- Expanded Wastewater Treatment Capacity

As described in Section III, only 36% of the total project costs will be attributable to the 10-year growth. Only the expanded wastewater treatment capacity is solely attributable to the 10-year growth. These impact fee capital improvements are shown in Table 5 and illustrated in Exhibit 5. The WWIF CIP was developed in conjunction with input from City of Midland staff and represents projects that will be needed to accommodate the growth projected in the Land Use Assumptions section of this report.

Table 5.A. 10-Year Wastewater Impact Fee Capital Improvements Plan – Summary

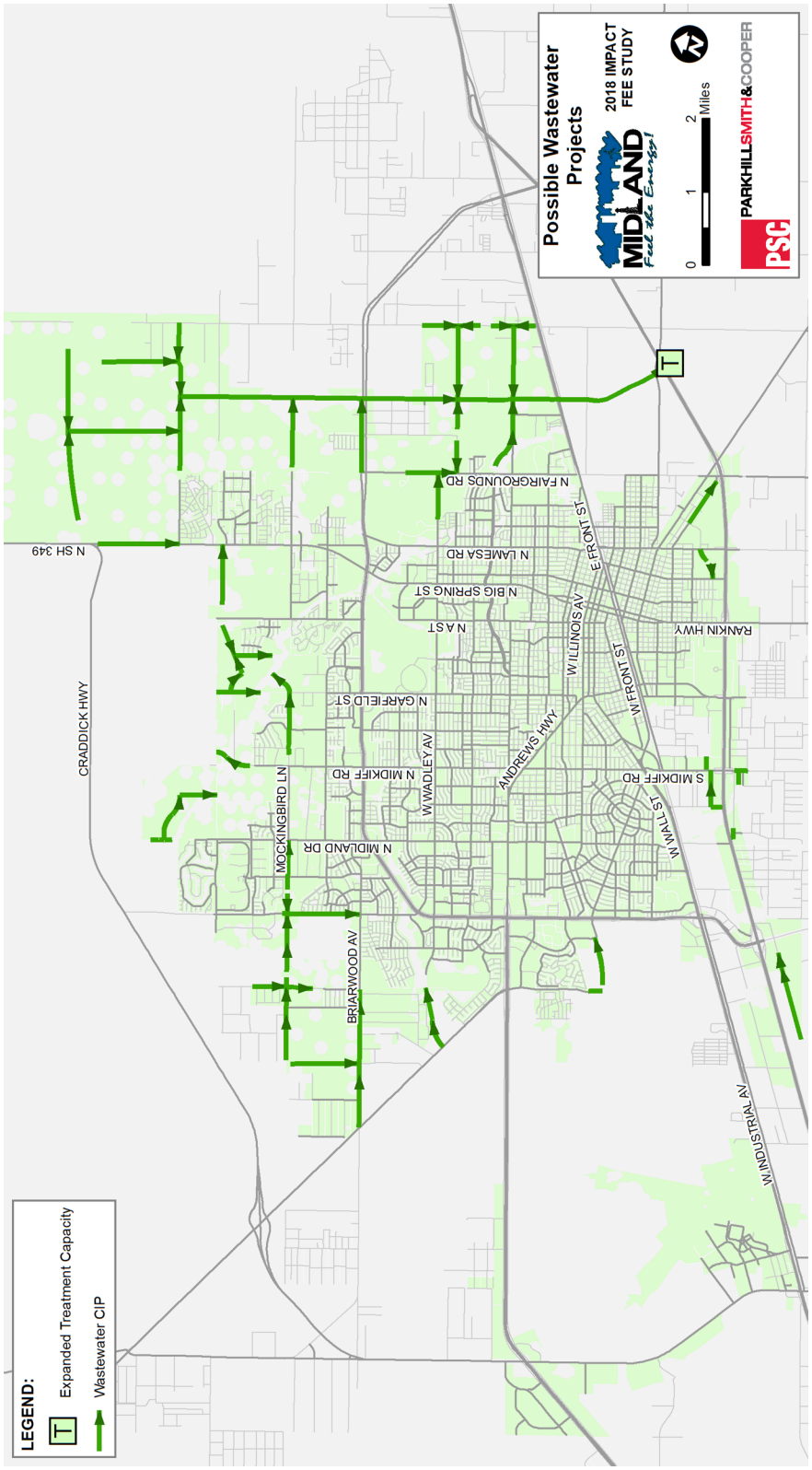
Cost Allocation for Wastewater Impact Fee Calculation				
Project #	Description of Project	2018 Percent Utilization	2028 Percent Utilization	2018-2028 Percent Utilization
1	New East Sewer Shed	0%	36%	36%
	OPC Projects: B2,3,8,11,20,23,24,34,38,39, D4,5,6,7,15,16,17			
2	Expansion of Midland Draw Trunk System	0%	36%	36%
	OPC Projects: A1,13,14,28,29,31,32, B4,5,6,9,10,16,17,30			
3	Expansion of Jal Draw Trunk System	0%	36%	36%
	OPC Projects: A3,4,5,6,8,9,10,11,12,15,16,17,18,20,21,22,25,26,27, C30,35			
4	Expansion of South Line System	0%	36%	36%
	OPC Projects: C6,7,8,10,11,13,14,15,23,24,32,33, D11,13			
5	Expanded Treatment Capacity	0%	100%	100%
	OPC Projects: E1			

Note: The 10-Year Wastewater Impact Fee CIP is not in a prioritized order.

Table 5.B. 10-Year Wastewater Impact Fee Capital Improvements Plan – Detail

Cost Allocation for Wastewater Impact Fee Calculation				
Project #	Description of Project	2018 Percent Utilization	2028 Percent Utilization	2018-2028 Percent Utilization
A1	15" SL - Midland Draw/Western T Section - GT Blvd to Midland Dr	0%	36%	36%
A3	8" SL - Mockingbird Ln - CR1250 to CR1244	0%	36%	36%
A4	8" SL - Mockingbird Ln - CR1244 to Golden Gate	0%	36%	36%
A5	8" SL - Mockingbird Ln - Golden Gate to Avalon	0%	36%	36%
A6	8" SL - Mockingbird Ln - EST to Avalon	0%	36%	36%
A8	8" SL - Mockingbird Ln - EST to Crowley	0%	36%	36%
A9	8" SL - Mockingbird Ln - Crowley to W. of Holiday Hill Road	0%	36%	36%
A10	12" SL - Mockingbird Ln - W. of HHR to HHR	0%	36%	36%
A11	8" SL - Mockingbird Ln - Oriole to HHR	0%	36%	36%
A12	8" SL - Mockingbird Ln - Oriole to Midland Dr	0%	36%	36%
A13	8" SL - Mockingbird Ln - W of Mayfield to Mayfield	0%	36%	36%
A14	12" SL - Mockingbird Ln - Mayfield to Garfield	0%	36%	36%
A15	8" SL - Briarwood - SH 158 to CR1250	0%	36%	36%
A16	15" SL - Briarwood - CR1250 to Golden Gate	0%	36%	36%
A17	15" SL - Briarwood - Golden Gate to Roadrunner	0%	36%	36%
A18	15" SL - Briarwood - Roadrunner to Avalon	0%	36%	36%
A20	12" SL - CR1250 - Mockingbird to Briarwood	0%	36%	36%
A21	8" SL - Avalon - City Limits to Mockingbird	0%	36%	36%
A22	12" SL - Avalon - Mockingbird to Lake Peggy Sue	0%	36%	36%
A25	15" SL - Holiday Hill Road - N of Mockingbird to S of Mockingbird	0%	36%	36%
A26	15" SL - Holiday Hill Road - S of Mockingbird to Riverside Dr	0%	36%	36%
A27	15" SL - Holiday Hill Road - Riverside Dr to Briarwood	0%	36%	36%
A28	8" SL - Midland Dr - North of A1 to A1	0%	36%	36%
A29	8" SL - Midland Dr - South of A1 to A1	0%	36%	36%
A31	8" SL - Midkiff - Fairfield to GT Blvd	0%	36%	36%
A32	8" SL - Garfield - Midland Draw to GT Blvd	0%	36%	36%
B2	15" SL - Oxy Parkway - Fairgrounds to Todd	0%	36%	36%
B3	8" SL - Oxy Parkway - Elkins to Todd	0%	36%	36%
B4	8" SL - Passage Way - Garfield to CRMWD	0%	36%	36%
B5	8" SL - CRMWD - Passage Way to Big Spring	0%	36%	36%
B6	12" SL - Future Collector in Woodland Park - CRMWD to Mockingbird	0%	36%	36%
B8	12" SL - Mockingbird - Fairgrounds to Todd	0%	36%	36%
B9	8" SL - Wadley - Ranchland Dr to Fairgrounds	0%	36%	36%
B10	8" SL - CR72 - Cynthia Dr to Fairgrounds	0%	36%	36%
B11	12" SL - CR72 - Cynthia Dr to Elkins	0%	36%	36%
B16	8" SL - Big Spring - Craddick Hwy to County Line	0%	36%	36%
B17	12" SL - Big Spring - County Line to Oxy Parkway	0%	36%	36%
B20	30" SL - Todd Rd - Oxy Parkway to CR72	0%	36%	36%
B23	8" SL - Elkins - City Limits to CR72	0%	36%	36%
B24	8" SL - Craddick Hwy - E of Big Spring to W of Elkins	0%	36%	36%
B30	12" SL - Fairgrounds - Hogan Park Entrance to CR 72	0%	36%	36%
B34	12" SL - Loop 250 - Fairgrounds to Todd	0%	36%	36%
B38	12" SL - W of Todd Road - Craddick Hwy to Oxy Parkway	0%	36%	36%
B39	12" SL - W of Elkins Road - S of Craddick Hwy to Oxy Parkway	0%	36%	36%
C6	8" SL - N Backage Road - City Limits to Mikdiff	0%	36%	36%
C7	8" SL - N Backage Road - Warehouse Dr to City Limits	0%	36%	36%
C8	8" SL - N Backage Road - City Limits to Mikdiff	0%	36%	36%
C10	8" SL - CR111 - I20 to Jasmine	0%	36%	36%
C11	8" SL - Jasmine - CR111 to Existing Sewer	0%	36%	36%
C13	8" SL - S Backage Road - City Limits to Midkiff	0%	36%	36%
C14	8" SL - Cholla Rd - City Limits to Future Acacia	0%	36%	36%
C15	8" SL - Cholla Rd - Future Acacia to Existing Sewer	0%	36%	36%
C23	8" SL - Warehouse Rd - I20 to N Backage Rd	0%	36%	36%
C24	8" SL - Midkiff - City Limits to Existing Sewer	0%	36%	36%
C30	8" SL - Wadley - SH 158 to Jal Draw	0%	36%	36%
C32	8" SL - Avalon - Mile High Ln to Thomason	0%	36%	36%
C33	8" SL - Thomason - Avalon to Tradewinds	0%	36%	36%
C35	12" SL - Wadley - Jal Draw to Nueva Vista	0%	36%	36%
D4	8" SL - Scharbauer Dr - Fairgrounds to Golf Course Road	0%	36%	36%
D5	12" SL - Golf Course Road - Scharbauer to Todd	0%	36%	36%
D6	12" SL - Golf Course Road - Evans to Todd	0%	36%	36%
D7	12" SL - Golf Course Road - Elkins to Evans	0%	36%	36%
D11	8" SL - Longview - Terrell to Lamesa	0%	36%	36%
D13	8" SL - Taylor Ave - Latta to Fairgrounds	0%	36%	36%
D15	36" SL - Todd Rd - CR72 to WPCP	0%	36%	36%
D16	8" SL - Elkins - S of CR72 to CR72	0%	36%	36%
D17	8" SL - Elkins - City Limits to BI20	0%	36%	36%
E1	Treatment Increase	0%	100%	100%

Exhibit 5 – Wastewater Impact Fee Capital Improvements Plan



V. METHODOLOGY FOR WATER AND WASTEWATER IMPACT FEES

A. Service Areas

The Service Area for both the Water and Wastewater Impact Fee is shown previously in **Exhibit 3.** This service area covers the entire corporate boundary of the City of Midland. The service area in the 2019 Water and Wastewater Impact Fee Study is consistent with the specification of Chapter 395 of the Texas Local Government Code.

B. Service Units

The "service unit" is a standard measure of consumption or use of the capital facilities by new development. In other words, it is the unit of measure used in the 2019 Water and Wastewater Impact Fee Study to quantify the supply and demand for water and sewer facilities in the City. For these purposes, the service unit is defined as a residential unit that predominately uses a 1" water meter. The service associated with public, commercial, and industrial connections is converted into service units based upon the capacity of the 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. The service unit equivalent is the ratio of the safe maximum operating capacity of the meter in question to the safe maximum operating capacity of a 1" meter. The service unit equivalent for each meter size used by the City of Midland is listed in Table 6. The capacity values used in the 2019 Water and Wastewater Impact Fee Study are based upon generally accepted meter capacity criteria from the manufacturer of the meters used by the City.

Table 6. Service Unit Equivalencies

(used in Water and Wastewater Impact Fee Study)

Water Meter Size	Meter Type	Safe Maximum Operating Capacity (gpm)	Service Unit Equivalent
1"	Neptune T-10 Positive Displacement	50 gpm	1.0
2"	Neptune Tru/Flo Compound	200 gpm	4.0
3"	Neptune Tru/Flo Compound	450 gpm	9.0
4"	Neptune Tru/Flo Compound	1000 gpm	20.0
6"	Neptune Tru/Flo Compound	2000 gpm	40.0

C. Cost Per Service Unit

A fundamental step in the impact fee process is to establish the cost for each service unit. In the case of the Water and Wastewater Impact Fees, this is the cost per single family residence unit, defined as the service unit equivalent of 1.0.

The second component of the cost per service unit is the determination of the number of service units. This number is the measure of the growth in water and wastewater demand that is projected to occur in the ten-year period. Chapter 395 requires that Impact Fees be assessed only to pay for growth projected to occur in the city limits within the next ten-years. Table 7 shows the projected number of service units based on the anticipated growth from the land use assumptions exercise.

Table 7. Projected Total Equivalent Service Units

(used in Water and Wastewater Impact Fee Study)

Land Use Type	# of Dwelling Units OR GPD Usage (Table 2.A)	Approximate Calculation of Equivalent Connections	Projected Total Equivalent Connections
Single-Family	7,591 Dwelling Units	7,591 DU x. 1.0 SF conn./DU	7,591
Multi-Family	4,503 Dwelling Units	4,503 DU x 1.0 SF conn./DU	4,503
Basic Emp. (Industrial)	44,702 gpd	44,702gpd/428gpd/SF conn.	10
Service Emp (Office)	416,880 gpd	416,880gpd/428gpd/SF conn.	974
Retail Emp (Lg & Sm Retail)	86,882 gpd	86,882gpd/428gpd/SF conn.	203
		TOTAL EQUIVALENT SERVICE UNITS =	~13,281

D. Water and Wastewater Impact Fee CIP Costing Methodology

All of the project costs for a facility which serves the overall water or wastewater system are eligible to be included in the WIF CIP or the WWIF CIP, respectively. Chapter 395 of the Texas Local Government Code specifies that the allowable costs are "…including and limited to the:

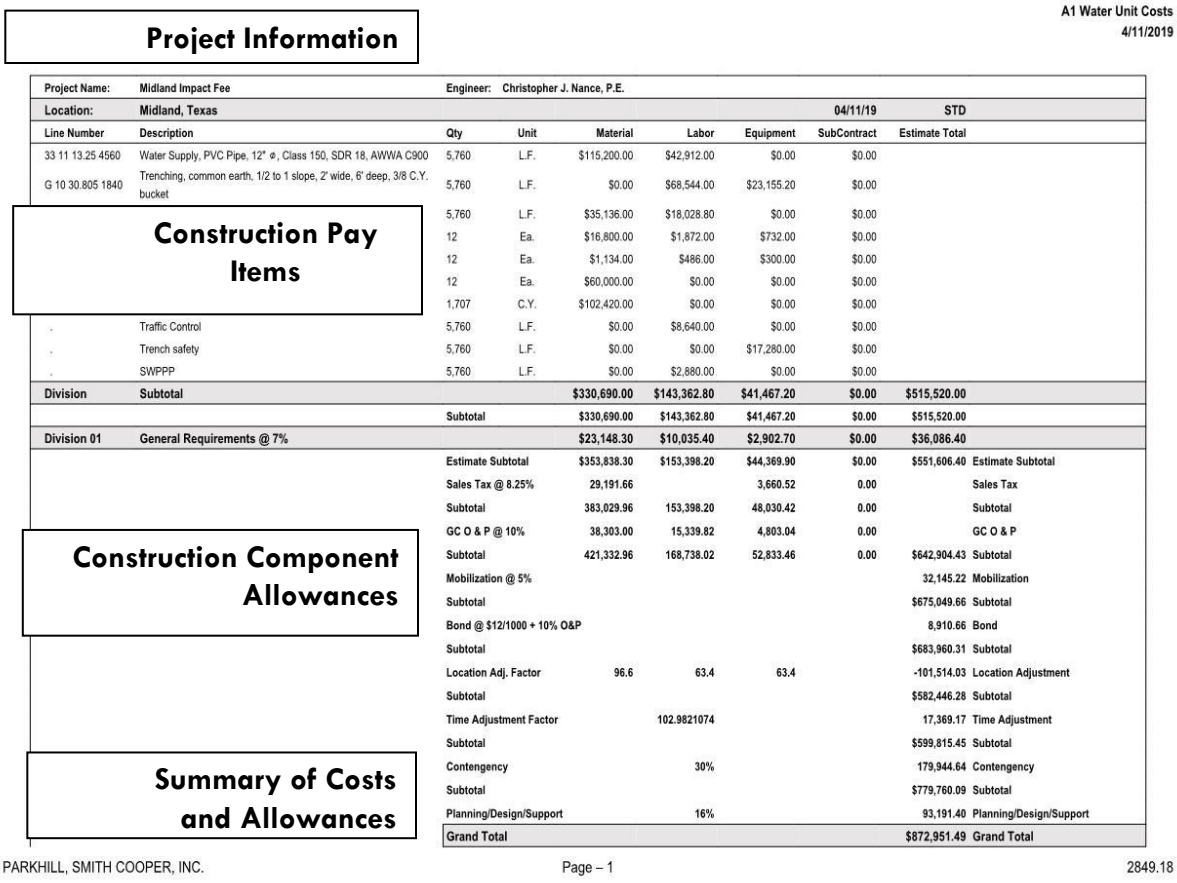
1. Construction contract price;
2. Surveying and engineering fees;
3. Land acquisition costs, including land purchases, court awards and costs, attorney's fees, and expert witness fees; and
4. Fees actually paid or contracted to be paid to an independent qualified engineer or financial consultant preparing or updating the CIP who is not an employee of the political subdivision."

The engineer's opinion of the probable costs of the projects in the WIF CIP and WWIF CIP is based, in part, on the calculation of a unit cost of construction. This means that a cost per linear foot of water line or wastewater line is calculated based on an average price for a few key components of the pipeline construction. This allows the probable cost to be determined by the size of line being constructed and the length of the project. The cost for location specific items such as pavement replacement, lift stations, pump stations, elevated storage tanks, or any other special components are added to each project, as appropriate or made their own project. The following is a detailed description of the costing worksheet/methodology for the Water Impact Fee CIP.

1. Overview of Water and Wastewater Impact Fee CIP Costing Worksheets

For each project a specific costing worksheet was developed (see **Appendix A**). Each worksheet contains project information, construction pay items, construction component allowances, and a summary of costs and allowances. These cost worksheets were developed as AACE Class 3 cost estimates, where 10-40% of project scope is defined, and include a contingency of 30%. An example of the costing sheets can be seen below.

Figure 2 – Example Cost Sheet



Project Information

Construction Pay Items

Construction Component Allowances

Summary of Costs and Allowances

A1 Water Unit Costs
4/11/2019

Project Name:	Midland Impact Fee	Engineer: Christopher J. Nance, P.E.						
Location:	Midland, Texas						04/11/19	STD
Line Number	Description	Qty	Unit	Material	Labor	Equipment	SubContract	Estimate Total
33 11 13.25 4560	Water Supply, PVC Pipe, 12" ø, Class 150, SDR 18, AWWA C900	5,760	L.F.	$115,200.00	$42,912.00	$0.00	$0.00	
G 10 30.805 1840	Trenching, common earth, 1/2 to 1 slope, 2' wide, 6' deep, 3/8 C.Y. bucket	5,760	L.F.	$0.00	$68,544.00	$23,155.20	$0.00	
		5,760	L.F.	$35,136.00	$18,028.80	$0.00	$0.00	
		12	Ea.	$16,800.00	$1,872.00	$732.00	$0.00	
		12	Ea.	$1,134.00	$486.00	$300.00	$0.00	
		12	Ea.	$60,000.00	$0.00	$0.00	$0.00	
		1,707	C.Y.	$102,420.00	$0.00	$0.00	$0.00	
.	Traffic Control	5,760	L.F.	$0.00	$8,640.00	$0.00	$0.00	
.	Trench safety	5,760	L.F.	$0.00	$0.00	$17,280.00	$0.00	
.	SWPPP	5,760	L.F.	$0.00	$2,880.00	$0.00	$0.00	
Division	Subtotal			$330,690.00	$143,362.80	$41,467.20	$0.00	$515,520.00
		Subtotal		$330,690.00	$143,362.80	$41,467.20	$0.00	$515,520.00
Division 01	General Requirements @ 7%			$23,148.30	$10,035.40	$2,902.70	$0.00	$36,086.40
		Estimate Subtotal		$353,838.30	$153,398.20	$44,369.90	$0.00	$551,606.40 Estimate Subtotal
		Sales Tax @ 8.25%		29,191.66		3,660.52	0.00	Sales Tax
		Subtotal		383,029.96	153,398.20	48,030.42	0.00	Subtotal
		GC O & P @ 10%		38,303.00	15,339.82	4,803.04	0.00	GC O & P
		Subtotal		421,332.96	168,738.02	52,833.46	0.00	$642,904.43 Subtotal
		Mobilization @ 5%						32,145.22 Mobilization
		Subtotal						$675,049.66 Subtotal
		Bond @ $12/1000 + 10% O&P						8,910.66 Bond
		Subtotal						$683,960.31 Subtotal
		Location Adj. Factor		96.6	63.4	63.4		-101,514.03 Location Adjustment
		Subtotal						$582,446.28 Subtotal
		Time Adjustment Factor			102.9821074			17,369.17 Time Adjustment
		Subtotal						$599,815.45 Subtotal
		Contengency			30%			179,944.64 Contengency
		Subtotal						$779,760.09 Subtotal
		Planning/Design/Support			16%			93,191.40 Planning/Design/Support
		Grand Total						$872,951.49 Grand Total

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2. Water and Wastewater Capacity Utilization

Proposed water and wastewater projects were evaluated to determine the proportion of the capacity of a project that will be utilized with the next 10 years. This ratio of the overall capacity is used as a percentage of the total project cost that is recoverable. (See next section.) The capacity utilized by the water and wastewater utilities is 36% of the total.

Table 2. 10-Year and Beyond Projections

Roadway Service Area *	Residential		Employment			Equivalent Connections
	Single Family	Multi-Family	Basic	Service	Retail	
	Dwelling Units		Sq. Ft.	Sq. Ft.	Sq. Ft.	
10-Year	7,591	4,503	804,000	10,422,000	2,533,000	13,375
Beyond 10-Year	9,038	11,317	85,461	21,766,670	14,918,953	23,596
10-Year Percentage	**46%**	**28%**	**90%**	**32%**	**15%**	**36%**

3. Water and Wastewater Recoverable Cost

Based on the above percentage utilization of the overall capacity within the Capital Improvement Plan projects for water and wastewater, the 10-year recoverable cost is calculated for each project. Some Opinions of Probable Cost were calculated on only the specific use within the 10-year window, and therefore are 100% recoverable. These values are also shown on in **Table 4 (Water)** and **Table 5 (Wastewater)**.