



## **AGENDA**

### **CAPITAL IMPROVEMENT ADVISORY COMMITTEE FEBRUARY 23, 2017 @ 7:00 P.M.**

Notice is hereby given; the Capital Improvement Advisory Committee for the City of Parker will hold a Regular Meeting on Thursday, February 23, 2017 at 7:00 P.M. at Parker City Hall, 5700 E. Parker Road, Parker, Texas, 75002.

#### **CALL TO ORDER – Roll Call and Determination of a Quorum**

#### **PLEDGE OF ALLEGIANCE**

AMERICAN PLEDGE: I pledge allegiance to the flag of the United States of America; and to the republic for which it stands, one nation under God, indivisible with liberty and justice for all.

TEXAS PLEDGE: Honor the Texas flag; I pledge allegiance to thee, Texas, one state under God, one and indivisible.

**PUBLIC COMMENTS** The Commission invites any person with business before the Commission to speak. No formal action may be taken on these items at this meeting. Please keep comments to 3 minutes.

#### **ROUTINE ITEMS**

1. CAPITAL IMPROVEMENT ADVISORY COMMITTEE (CIAC) WATER IMPACT FEES REPORT REVIEW AND WRITTEN RECOMMENDATION FOR CITY COUNCIL
2. FUTURE AGENDA ITEMS
3. ADJOURN

In addition to any specifically identified Executive Sessions, the Planning and Zoning Commission may convene into Executive Session at any point during the open meeting to discuss any item posted on this Agenda. The Open

Meetings Act provides specific exceptions that require that a meeting be open. Should Commission elect to convene into Executive Session, those exceptions will be specifically identified and announced. Any subsequent action, as a result of this Executive Session, will be taken and recorded in open session.

I certify that this Notice of Meeting was posted on or before February 17, 2017 by 5:00 p.m. at the Parker City Hall.

\_\_\_\_\_  
Date Notice Removed

\_\_\_\_\_  
Patti Scott Grey, City Secretary



The Parker City Hall is Wheelchair accessible. Sign interpretations or other special assistance for disabled attendees must be requested 48 hours in advance by contacting the City Secretary's Office at 972-442-6811.

Revised Schedule of Meetings, Agendas and Public Notices for the City of Parker's Water Impact Fee Update process.

<b>Advisory Committee (P&amp;Z) Meetings</b>	<b>City Council Meeting</b>	<b>City Staff</b>	<b>Meeting/Action</b>	<b>Agenda and Action Required</b>
		October 3 (1 <sup>st</sup> Monday)	City Staff	<ul style="list-style-type: none"> <li>• Kick-off Meeting for Impact Fee Process</li> </ul>
November 10 (2 <sup>nd</sup> Thursday)			Advisory Committee	<ul style="list-style-type: none"> <li>• Present Water CIP to Advisory Committee (provide by Nov. 2<sup>nd</sup>)</li> <li>• Advisory Committee Written Recommendation to Council for Land Use Assumptions and CIP</li> </ul>
	December 6 (1 <sup>st</sup> Tuesday)		City Council	<ul style="list-style-type: none"> <li>• Set Public Hearing Date for Land Use Assumptions and Water CIP (for January 9, 2017)</li> </ul>
		December 8 (2 <sup>nd</sup> Friday)	City Staff	<ul style="list-style-type: none"> <li>• Publish Notice for Land Use and Water CIP Public Hearing (for Jan 9, 2017)</li> <li>• Land Use Assumptions and Water CIP for Impact Fees Available for Public Review</li> </ul>
	January 9 (2 <sup>nd</sup> Monday)		City Council	<ul style="list-style-type: none"> <li>• Land Use Assumptions and Water CIP Public Hearing</li> <li>• Adopt Land Use Assumptions and Water CIP</li> </ul>
February 16 (3 <sup>rd</sup> Thursday)				<ul style="list-style-type: none"> <li>• Deliver Impact Fee Report to City</li> </ul>
February 23 (4 <sup>th</sup> Thursday)			Advisory Committee	<ul style="list-style-type: none"> <li>• Water Impact Fees to Advisory Com. (provide by Feb 16<sup>th</sup>)</li> <li>• Advisory Committee Written Recommendation to Council</li> </ul>
	March 7 (1 <sup>st</sup> Tuesday)		City Council	<ul style="list-style-type: none"> <li>• Set Public Hearing date for Water Impact Fee (April 18, 2017)</li> </ul>
		March 10 (2 <sup>nd</sup> Friday)	City Staff	<ul style="list-style-type: none"> <li>• Publish Notice for Water Impact Fee Public Hearing</li> <li>• Water Impact Fee Report Available for Public Review</li> </ul>
	April 18 (3 <sup>rd</sup> Tuesday)		City Council	<ul style="list-style-type: none"> <li>• Public Hearing for Water Impact Fee</li> <li>• Adopt Water Impact Fee</li> </ul>



# **WATER IMPACT FEE REPORT 2016 - 2026**



*Submitted To The City Of*



*Submitted By*



**BIRKHOFF, HENDRICKS & CARTER, L.L.P.**  
***SPECIALIZING IN CIVIL ENGINEERING FOR  
MUNICIPALITIES AND GOVERNMENTAL AGENCIES***



*February 2017*

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CRAIG M. KERKHOFF, P.E.

February 16, 2017

Mr. Jeff Flanigan  
City Administrator  
City of Parker  
5700 East Parker Road  
Parker, Texas 75002

Re: Water Impact Fee Study  
2016 - 2026

Dear Mr. Flanigan:

This report presents the results of the City of Parker's Water Impact Fee Study for the planning years 2016 through 2026. This report includes the updated land use assumptions (prepared by the City's Capital Improvements Advisory Committee), the impact fee Capital Improvements Plan, and the Maximum Impact Fees by meter size for new water accounts. The maximum allowable fee per service unit (for a 1-inch water meter), adjusted to fifty percent (50%) of the calculated maximum are:

Maximum Allowable Water Impact Fee per Service Unit ..... \$ 3,938.95

We have enjoyed working with the City on this important study and are available to discuss the findings and conclusions of this updated impact fee further at your convenience. We look forward to our continued working relationship with you and the City of Aubrey.

Sincerely,



  
Andrew Mata Jr., P.E.

**CITY OF PARKER, TEXAS  
WATER IMPACT FEE STUDY  
2016 TO 2026**

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**APPENDIX: WATER IMPACT FEE UTILIZED CAPACITY TABLES:**

- Existing Water Lines Utilized Capacity Tables
- Existing Facilities Utilized Capacity Tables
- Proposed Water Lines Utilized Capacity Tables
- Proposed Water Facilities Utilized Capacity Tables

**CITY OF PARKER, TEXAS  
WATER IMPACT FEE STUDY  
2016 to 2026**

**A. INTRODUCTION**

Chapter 395, of the Local Government Code is an act that provides guidelines for financing capital improvements required by new development in municipalities, counties, and certain other local governments. Under Chapter 395, political subdivisions receive authorization to enact or impose impact fees on land that is located within their political subdivision's corporate boundaries or extraterritorial jurisdictions. No governmental entity or political subdivision can enact or impose an impact fee unless they receive specific authorization by state law or by Chapter 395.

An "Impact Fee" is a charge or assessment imposed by a political subdivision for new development within its service area in order to generate revenue for funding or recouping the costs of capital improvements necessitated by and attributable to the new development.<sup>1</sup> The City of Parker's current water Certificate of Convenient and Necessity (CCN) is CCN No. 10207. The Water Service Area extends to the Extra Territorial Jurisdiction (ETJ) and includes some area located within the City of Wylie. However, the portion of the area located in the City of Wylie was determined by the City's Impact Fee Advisory Committee to be built out and no additional infrastructure would be needed to support additional growth. The first step in determining an impact fee is preparation of land use and growth assumptions for the service area for the next ten years. That step has been completed and provided by the City's Impact Fee Advisory Committee in the Land Use Assumptions Report, dated August 29, 2016. Next, a Capital Improvements Plan must be created to describe the water distribution system infrastructure that will be necessary to serve the anticipated land uses and growth. The following section describes the Water Impact Fee.

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<sup>1</sup> P. 831, Texas Local Government Code, West's Texas Statutes and Codes, 1998 Edition.

## **B. WATER IMPACT FEES**

The following items can be included in the water impact fee calculation:

- 1) The portion of the cost of the new infrastructure that is to be paid by the City, including engineering, property acquisition and construction cost.
- 2) Existing excess capacity in lines and facilities that will serve future growth and which were paid for in whole or part by the City and part by the Developer.
- 3) Interest and other finance charges on bonds issued by the City to cover its portion of the cost.

These items are summed and the utilized capacity is calculated over the impact fee period. The maximum allowable impact fee per service unit may not exceed fifty percent of the calculated maximum amount of the total utilized capital improvement cost divided by the total number of new standard service units. This maximum allowable impact fee recovers a portion of the City's costs for the construct of facilities to serve the new developments and support new growth. However, the City may recover the maximum fee by crediting the portion of utility service revenue generated by new service units during the 10-year program period.

Chapter 395 requires that an update of the land use assumptions, capital improvements plan, and impact fees be performed every five years, unless it is determined by the political subdivision after a review that such an update is not necessary.

This section of the report constitutes the City's 2016 water portion of the Capital Improvements Plan, and the maximum allowable impact fees. As required by state law, the study period is a ten-year period with 2016 as the base year. The engineering analysis of the water system is based on established land use in the year 2016, projected land use patterns through the year 2026, and on proposed infrastructure.

The engineering analysis portion of the City of Parker's 2016 Impact Fee determines utilized capacity cost of the water distribution system master plan between the years 2016 and 2026.

## C. GLOSSARY

1. Advisory Committee means the capital improvements advisory committee established by the City for purposes of reviewing and making recommendations to the City Council on adoption and amendment of the City's impact fee program.
2. Area-related facility means a capital improvement or facility expansion which is designated in the impact fee capital improvements plan and which is not a site-related facility. Area-related facility may include a capital improvement which is located off-site, or within or on the perimeter of the development site.
3. Assessment means the determination of the amount of the maximum impact fee per service unit which can be imposed on new development.
4. Capital improvement means a water facility, wastewater facility or roadway with a life expectancy of three or more years, to be owned and operated by or on behalf of the City.
5. City means the City of Parker, Texas.
6. Credit means the amount of the reduction of an impact fee due, determined under this ordinance or pursuant to administrative guidelines that is equal to the value of area-related facilities provided by a property owner pursuant to the City's subdivision or zoning regulations or requirements, for the same type of facility.
7. Facility expansion means either a water facility expansion, sewer facility expansion or roadway expansion.
8. Final plat approval means the point at which the applicant has complied with all conditions of approval in accordance with the City's subdivision regulations, and the plat has been approved for filing with Collin County.
9. Impact fee means either a fee for water facilities, wastewater facilities or roadway facilities, imposed on new development by the City pursuant to Chapter 395 of the Texas Local Government Code in order to generate revenue to fund or recoup the costs of capital improvements or facility expansion necessitated by and attributable to such new development. Impact fees do not include the dedication of rights-of-way or easements for



such facilities, or the construction of such improvements, imposed pursuant to the City's zoning or subdivision regulations.

10. Impact fee capital improvements plan means either a water capital improvements plan, wastewater capital improvements plan or roadway capital improvements plan, adopted or revised pursuant to the impact fee regulations.
11. Land use assumptions means the projections of population and growth, and associated changes in land uses, densities and intensities over at least a ten-year period, as adopted by the City and as may be amended from time to time, upon which the capital improvements plans are based.
12. Land use equivalency table means a table converting the demands for capital improvements generated by various land uses to numbers of service units, as may be amended from time to time.
13. New development means the subdivision of land; the construction, reconstruction, redevelopment, conversion, structural alteration, relocation, or enlargement of any structure; or any use or extension of the use of land; any of which increases the number of service units.
14. Plat has the meaning given the term in the City's subdivision regulations. Plat includes replat.
15. Platting has the meaning given the term in the City's subdivision regulations. Platting includes replatting.
16. Property owner has the meaning given the term in the City's subdivision regulations. Property owner includes the developer for a new development.
17. Recoupment means the imposition of an impact fee to reimburse the City for capital improvements which the City had previously oversized to serve new development.
18. Roadway facility means any freeway, expressway, principal or minor arterial or collector roadways designated in the City's adopted Thoroughfare Plan, as may be amended from time to time. It can include any roadway designated as a numbered highway on the official

Federal or Texas highway system. It includes but is not limited to the establishment of curbs, gutters, sidewalks, drainage appurtenances, street lights and right-of-ways.

19. Roadway capital improvements plan means the adopted plan, as may be amended from time to time, which identifies the roadway facilities or roadway expansions and their costs for each road service area, which are necessitated by and which are attributable to new development, for a period not to exceed 10 years.
20. Roadway facility expansion means the expansion of the capacity of an existing roadway in the City to serve new development. It does not include the repair, maintenance, modernization, or expansion of an existing roadway to better serve existing development.
21. Service area means either a water service area or wastewater benefit area within the City, within which impact fees for capital improvements or facility expansion will be collected for new development occurring within such area, and within which fees so collected will be expended for those types of improvements or expansions identified in the type of capital improvements plan applicable to the service area. For roadways, it means a roadway service area within the city limits.
22. Service unit means the applicable standard units of measure shown on the land use equivalency table in the Impact Fees Capital Improvements Plan which can be converted to water meter equivalents, for water or for wastewater facilities, which serves as the standardized measure of consumption, use or generation attributable to the new unit of development. For roadway facilities, the service unit is converted vehicle miles.
23. Site-related facility means an improvement or facility which is for the primary use or benefit of a new development, and/or which is for the primary purpose of safe and adequate provision of water, wastewater or roadway facilities to serve the new development, and which is not included in the impact fees capital improvements plan and for which the property owner is solely responsible under subdivision or other applicable development regulations.
24. Utility connection means installation of a water meter for connecting a new development to the City's water system, or connection to the City's wastewater system.
25. Wastewater facility means a wastewater interceptor or main, lift station or other facility included within and comprising an integral component of the City's collection system for

wastewater. Wastewater facility includes land, easements or structure associated with such facilities. Wastewater facility excludes site-related facilities.

26. Wastewater facility expansion means the expansion of the capacity of any existing wastewater improvement for the purpose of serving new development, but does not include the repair, maintenance, modernization, or expansion of an existing sewer facility to serve existing development.
27. Wastewater capital improvements plan means the adopted plan, as may be amended from time to time, which identifies the wastewater facilities or wastewater expansions and their associated costs which are necessitated by and which are attributable to new development, for a period not to exceed 10 years.
28. Water facility means a water interceptor or main, pump station, storage tank or other facility included within and comprising an integral component of the City's water storage or distribution system. Water facility includes land, easements or structures associated with such facilities. Water facility excludes site-related facilities.
29. Water facility expansion means the expansion of the capacity of any existing water facility for the purpose of serving new development, but does not include the repair, maintenance, modernization, or expansion of an existing water improvement to serve existing development.
30. Water improvements plan means the adopted plan, as may be amended from time to time, which identifies the water facilities or water expansions and their associated costs which are necessitated by and which are attributable to new development, for a period not to exceed 10 years.
31. Water meter means a device for measuring the flow of water to a development, whether for domestic or for irrigation purposes.

#### **D. LAND USE ASSUMPTIONS SUMMARY**

Under Chapter 395, of the Local Government Code, “Land Use Assumptions” includes a description of service area and projected changes in land uses, densities, intensities, and population in the service area for a minimum of a 10-year period. In order to impose an impact fee, the City must adopt an order, ordinance, or resolution that establishes a public hearing date to consider the land use assumptions within the designated service area. After the public hearing on the land use assumptions, the City makes a determination of adoption or rejection of the ordinance, order or resolution approving the land use assumptions that will be utilized to develop the Capital Improvement Plan.

The Land Use Assumptions used in this impact fee process were prepared by the City of Parker’s Impact Fee Advisory Committee, and are presented in the following document, titled “Land Use Assumptions Report of the Capital Improvements Advisory Committee of the City of Parker”.



# Land Use Assumptions Report of the Capital Improvements Advisory Committee of the City of Parker

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Revision C - August 29, 2016

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## Executive Summary

The Capital Improvements Advisory Committee (the "Committee") was appointed by the City of Parker City Council to review the subjects identified below and render an opinion on the land use assumptions necessary for the City to create and adopt lawful impact fees for the City of Parker public water system. The Committee has reviewed the Comprehensive Plan, the land use data, the current development within Parker, the current zoning within Parker, and the existing water plans for future growth and development. The Committee's report on the Land Use Assumptions required by Texas Local Government Code with relation to the Committee's work on impact fee research is contained within.

Members of this Committee include regular members of the Planning and Zoning Commission, experienced developers within the City of Parker, its ETJ, and key City personnel.

**Table 1 - Capital Improvements Advisory Committee Members**

Name	Role
<b>Russell Wright</b>	P&Z Chairman
<b>Joe Lozano</b>	P&Z Vice-Chairman
<b>Cleburne Raney</b>	P&Z Member
<b>Jasmat Sutaria</b>	P&Z Member
<b>Wei Wei Jeang</b>	P&Z Member
<b>JR Douglas</b>	P&Z Alternate, Developer
<b>Steve Sallman</b>	Developer/ETJ Owner
<b>Jim Shepherd</b>	City Attorney
<b>Jeff Flanigan</b>	City Administrator
<b>Patti Scott Grey</b>	City Secretary

## Analysis of Existing Conditions

Each member of the Committee is personally familiar with the existing development within the City of Parker. The areas of the City of Parker that are not yet developed were presented by the City Administrator and the relevant maps and data were reviewed. This data review included the population (Exhibit 1), existing zoning (Exhibit 2), and the Comprehensive Plan (Exhibit 3), current Development Map (Exhibit 4), and the Water Master Plan Map (Exhibit 5) for the City as it relates to the undeveloped areas of Parker and its ETJ.

## Determination of Service Area

The City Council's charge to the Committee was to render an opinion on the land use assumptions necessary for the City to create and adopt lawful impact fees for the City of Parker public water system. The Committee reviewed the requirements to exclude the provisions and related costs to current development and concentrated on the capital improvements necessary to serve future development based on the existing conditions noted above, and the anticipated use of the comprehensive plan and related development plans of the City, all as required by the Texas Local Government Code. The service area for a water impact fee would be the entire City and its ETJ with respect to new development in any portion of this area.

There is a portion of the City's water service area (CCN, Certificate of Convenience and Necessity) that lies within the City of Wylie. This was discussed as whether it should be included in the impact fee Service Area. The City Administrator noted that the water infrastructure in that area is already built out to specifications that would not necessitate additional infrastructure capital improvements. Therefore, it was concluded by the committee to not include this area within the Service Area.

Additionally, The City has a Special Activities area of approximately 188 acres (Southfork Ranch) which, at some point in the future, could be developed and subsequently subdivided. While there are no specific plans at the time of this writing, it is important to include this area for any future plans.

### Growth Projections

Based on the review of the factors set forth in the sections above, *Analysis of Existing Conditions* and *Determination of Service Area*, the Committee projected the 10 year growth patterns as they relate to water system capital improvements are as set forth in Table 6 - Land Use Assumptions (Exhibit A). The Committee's findings are based on the following discussions and calculations.

### Density Calculations

The Committee agrees with the Comprehensive Plan of Parker with regard to the future development of Parker and its ETJ. Consequently, for those areas zoned SF-Single Family, the Committee has projected single family residential units on lots of two acres, with three residents per household. For those areas projected to be zoned SFT-Single Family Transitional, the Committee anticipates 1 acre minimum lots, with a 1.5 acre average size of lots in the subdivision. The population estimate for SFT is also three residents per unit. Additional zoning categories such as Special Activities, Agricultural, Manufactured Housing and non-conforming uses, were all considered in the analysis.

The raw data in Table 2 was used as the basis of the analysis. The Meters column indicates the number of water meters the City was billing in that year. The Estimated Residents (Est. Residents) is based on the assumption of three residents per household, as indicated above. The % Change is expressed as the delta (change in number of meters) from the prior year divided by the number of meters in the prior year, e.g.  $98/688=14.2\%$ .

**Table 2 - Historical Water Meters (i.e. Service Units) for 2000 - Jan 2016**

Year	Meters	Est. Residents	Delta	% Change	Std. Dev.
2000	688	2064	688.0		
2001	786	2358	98.0	14.2%	5.1%
2002	938	2814	152.0	19.3%	4.6%
2003	1022	3066	84.0	9.0%	2.1%
2004	1075	3225	53.0	5.2%	1.4%
2005	1121	3363	46.0	4.3%	
2006	1180	3540	59.0	5.3%	
2007	1210	3630	30.0	2.5%	
2008	1258	3774	48.0	4.0%	
2009	1273	3819	15.0	1.2%	
2010	1295	3885	22.0	1.7%	
2011	1320	3960	25.0	1.9%	
2012	1351	4053	31.0	2.3%	
2013	1385	4155	34.0	2.5%	
2014	1404	4212	19.0	1.4%	
2015	1435	4305	31.0	2.2%	
2016	1501	4503	66.0	4.6%	

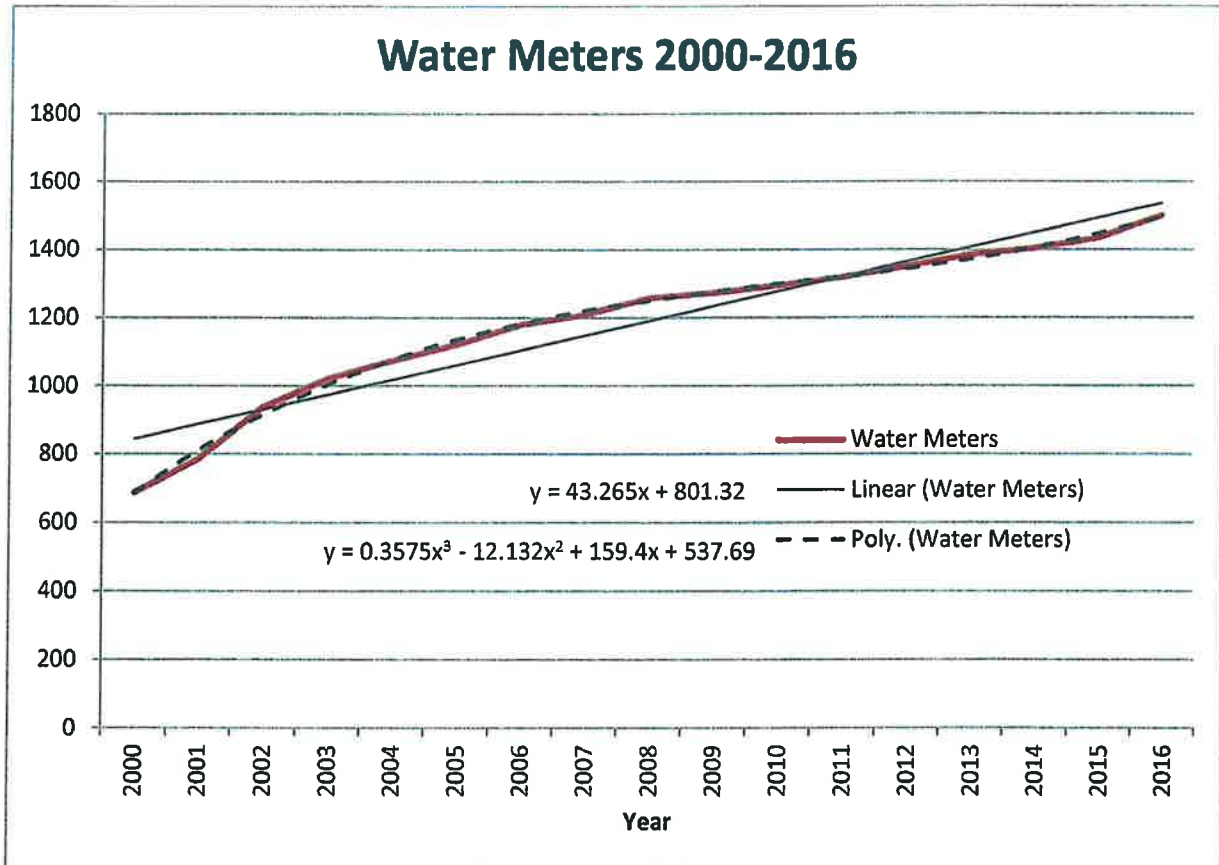
Referring to the standard deviation of a sample<sup>1</sup> Table 2, we can see the standard deviation for years 2001 and 2002 are significantly greater than several of the later years, so it was concluded that this extreme rate of growth for the City of Parker will likely not repeat itself. However, the Committee concluded the economic factors of many companies moving into the surrounding areas will likely increase

<sup>1</sup> Excel function STDEV.S is used to calculate the standard deviation of a sample.



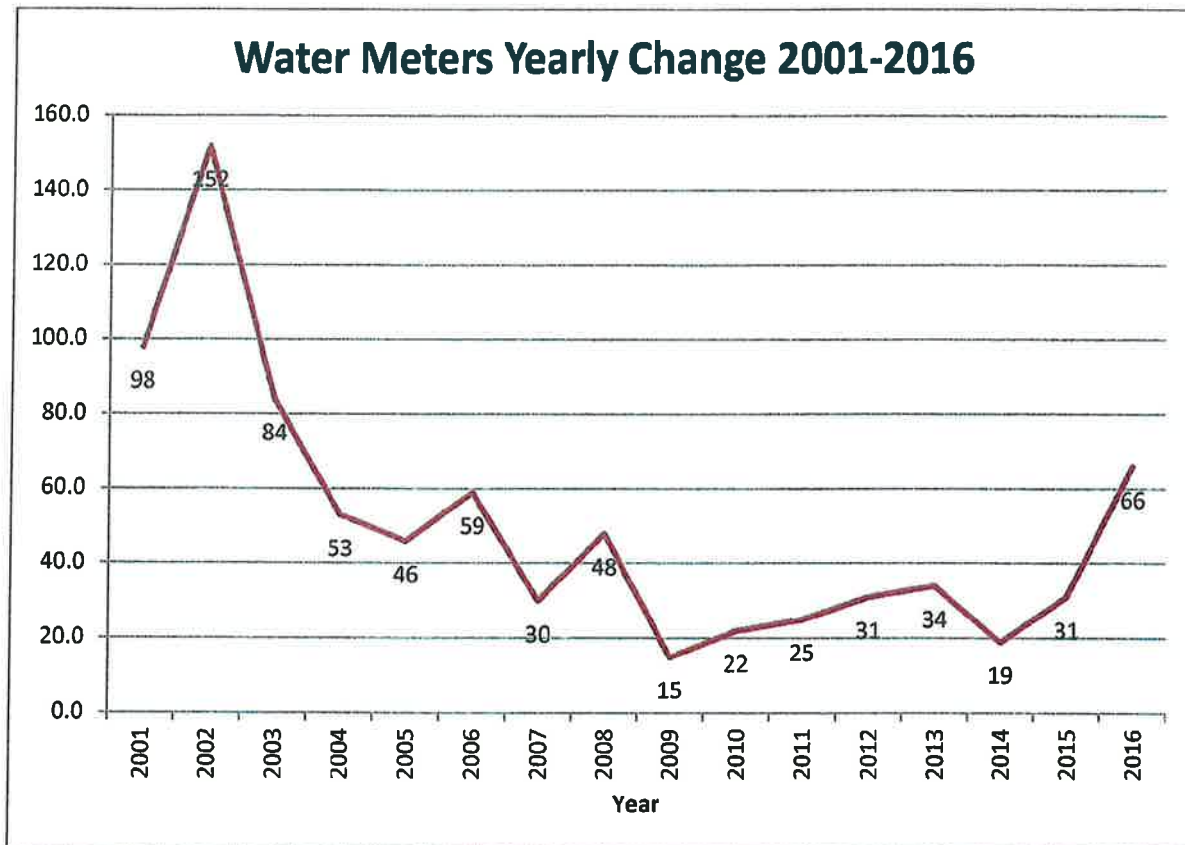
the growth rate for the next several years, which might indicate above average growth for four to five years (5-6%), followed by slower growth (2-3%). In its final estimation, the committee agreed that 5% growth for the next five years (2017-2021) followed by 3% growth for the following five years (2022-2026) was a reasonable compromise.

When the absolute number of water meters is graphed over the years for which data exists, a curve as shown in Figure 1 develops. For comparison purposes, linear and 3<sup>rd</sup> order polynomial trend lines are added, along with their respective formulae.



**Figure 1 - Water Meter Graph**

Figure 2 shows a graphical representation of the tabular data in Table 2. Since there was no detailed recording of service unit numbers prior to the year 2000, it is difficult to determine if the upward trend of the graph is representative of the years prior to 2000. However, as stated earlier, this could represent the beginning of an upward “growth spurt” for the City and this upward trend has been considered in the analysis of the overall growth projections.



**Figure 2 - Water Meters Delta from Prior Year**

For selected time periods, average year on year growth rates can be established. Several time periods were used (refer to Table 3) to show the difference in growth rate when some of the outlying data is included or excluded.

**Table 3 - Selected Year on Year Growth Rates**

Period	# Periods	Avg. YoY Growth Rate
2001-2016	16	5.1%
2003-2016	14	3.4%
2001-2011	10	6.2%
2003-2013	10	3.6%

### Build Out

Table 4 shows the analysis of the estimated number of lots, which correspond directly to service units in the City, for areas covered by zoning or development agreements and all undeveloped land. The estimated lots for those areas already approved are actual numbers. For the undeveloped areas a factor of 0.9<sup>2</sup> is used to allow for those areas dedicated for roads, rights-of-way and other unusable areas.

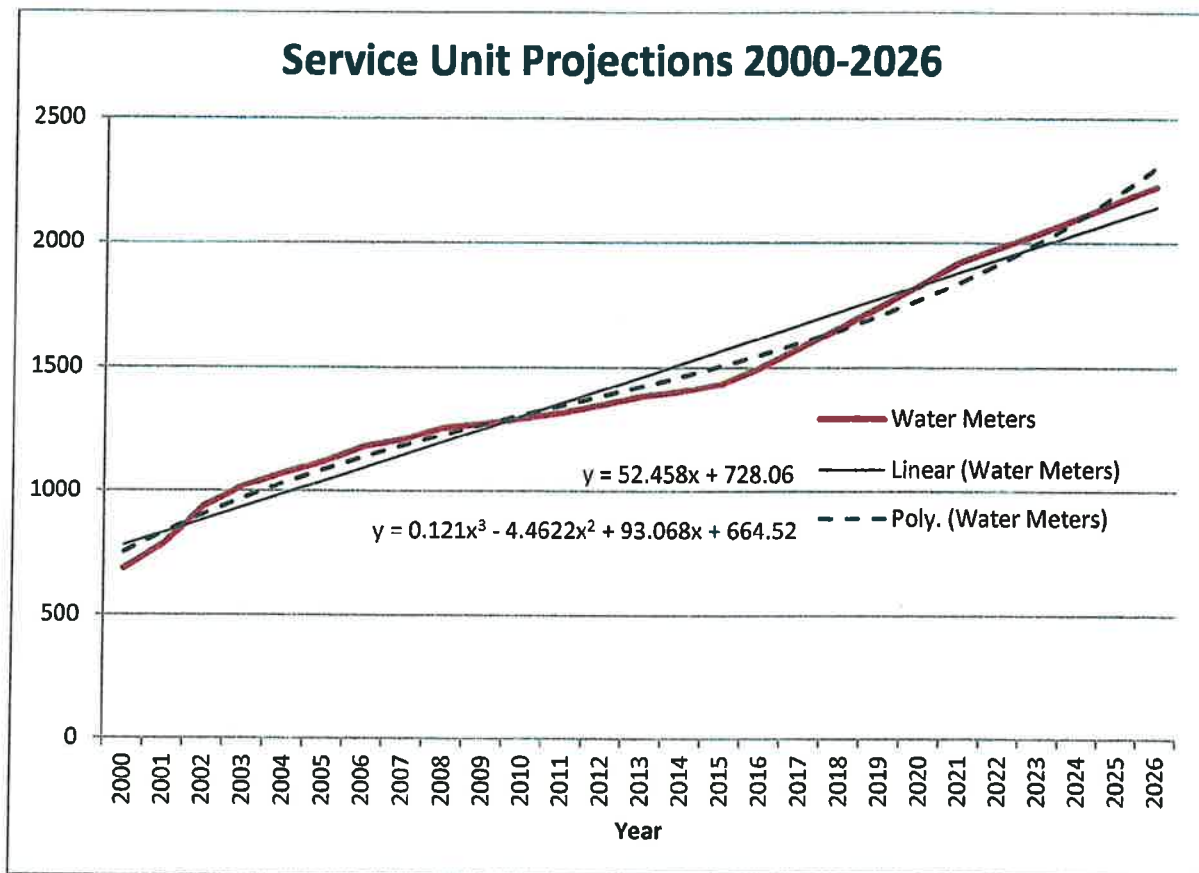
<sup>2</sup> Formula used: Number of acres \* Lots/Acre \* 0.9

**Table 4 - Future Service Area Impact**

Future Service Area	Acres	Lots/Acre	Est. Lots/Service Units	Est. Residents
<b>Approved by Zoning or Development Agreement</b>	1500	0.646	969	2907
<b>Undeveloped in ETJ</b>	720	1	648	1944
<b>Undeveloped Zoned SF</b>	500	0.5	225	675
<b>Undeveloped Zoned SFT</b>	400	0.67	241	724
<b>Current Special Activities Area<sup>3</sup></b>	188	2		
<b>Totals</b>	3120	NA	2083	6250

Add plus existing homes.

The current number of residents and population within Parker and its anticipated growth patterns over the next 10 years are as set forth in Table 6 - Land Use Assumptions (Exhibit A). The projections shown in Table 6 provide Parker's ultimate build-out growth projections, including existing development within Parker, anticipated future development on currently undeveloped land within Parker, and development in the extra-territorial jurisdiction (ETJ).

**Figure 3 - Service Unit Projection Graph**

<sup>3</sup> Southfork Ranch is a Special Activities area that is included in the table but not included in calculations.

**Table 5 - Actual and Estimated Service Units**

Year	Meters	Linear equation	Poly equation
2000	688	845	685
2001	786	888	811
2002	938	931	916
2003	1022	974	1004
2004	1075	1018	1076
2005	1121	1061	1135
2006	1180	1104	1182
2007	1210	1147	1219
2008	1258	1191	1250
2009	1273	1234	1276
2010	1295	1277	1299
2011	1320	1320	1321
2012	1351	1364	1345
2013	1385	1407	1372
2014	1404	1450	1406
2015	1435	1493	1447
2016	1501	1537	1498
2017	1581	1580	1561
2018	1660	1623	1639
2019	1743	1666	1733
2020	1830	1710	1846
2021	1922	1753	1979
2022	1979	1796	2136
2023	2039	1839	2317
2024	2100	1883	2526
2025	2163	1926	2764
2026	2228	1969	3034

**Table 6 - Land Use Assumptions (Exhibit A)**

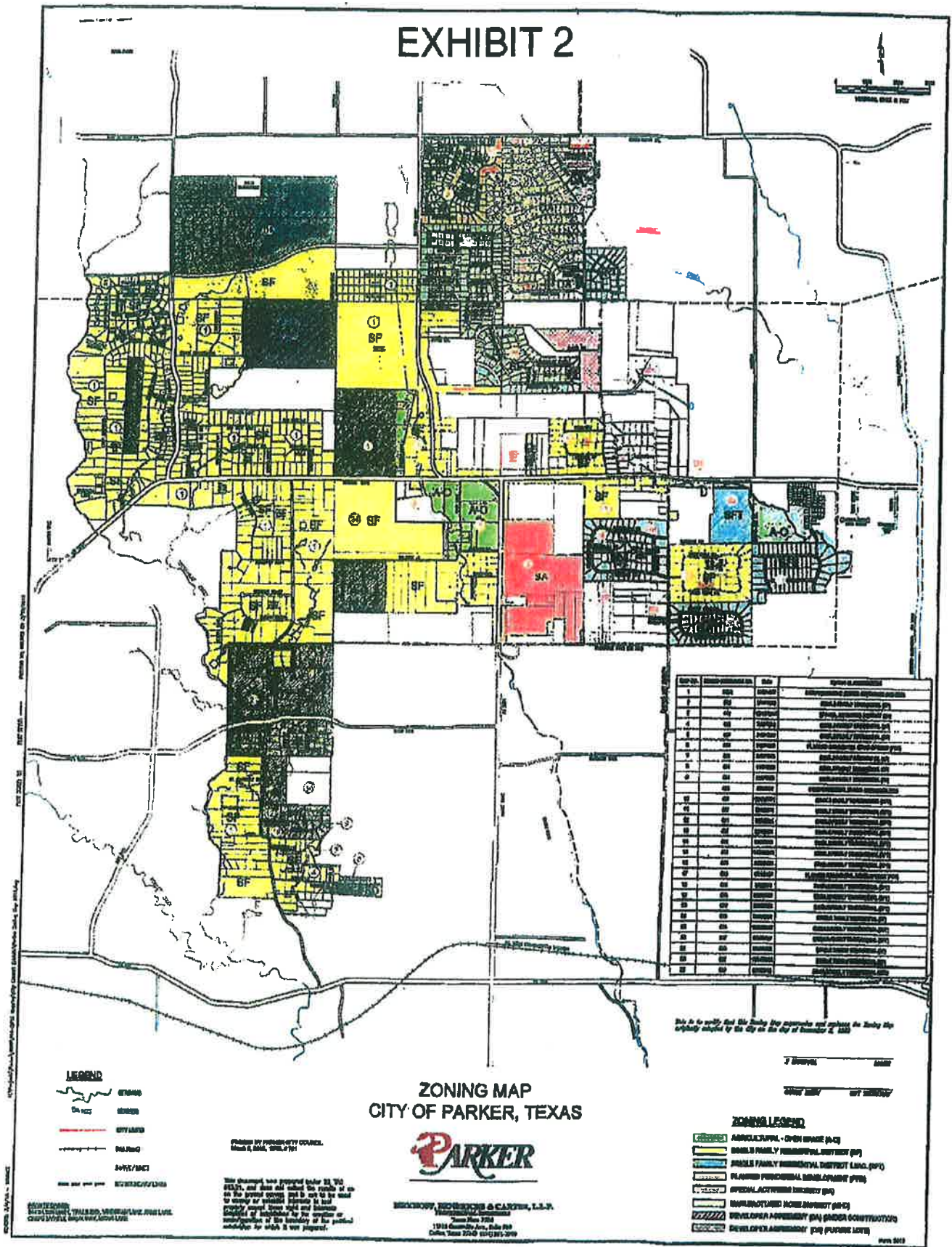
	2016 (Current)	2021	2026	Buildout
Homes	1,501	1,922	2,228	4,000 <sup>4</sup>
Mfg'd Housing	75 <sup>5</sup>	75	75	75
Commercial	0	10	20	20
Public	0	0	0	0
Totals	1,576	2,007	2,323	4,095
Population	4,503	6,021	6,969	12,000

<sup>4</sup> Buildout based on total population of 12,000<sup>5</sup> 75 manufactured houses, 75 houses in CCN (not in City) is a wash

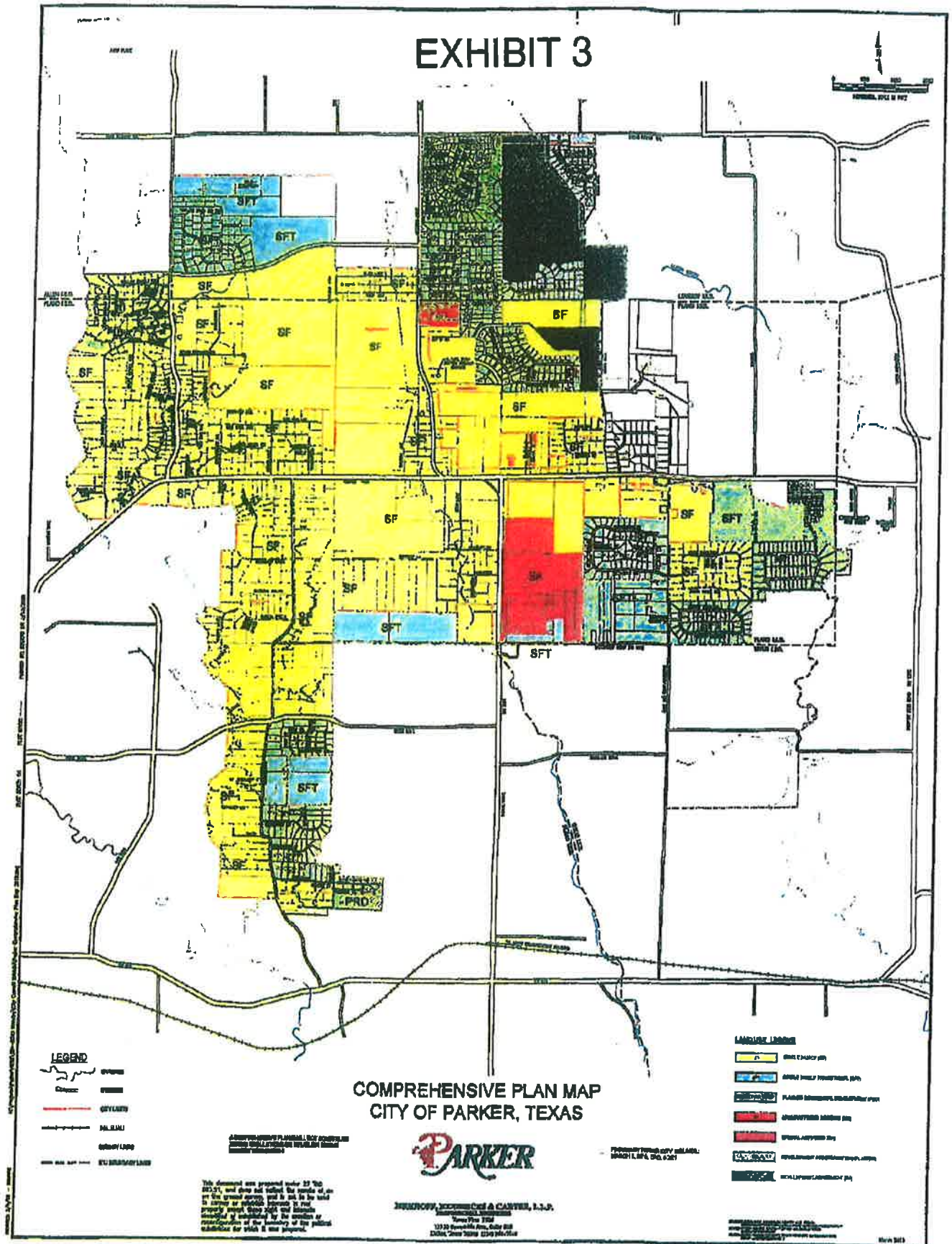
# EXHIBIT 1

<b>Year</b>	<b>January Water Meters</b>	<b>x 3 per household</b>
<b>2000</b>	<b>688</b>	<b>2064</b>
<b>2001</b>	<b>786</b>	<b>2358</b>
<b>2002</b>	<b>938</b>	<b>2814</b>
<b>2003</b>	<b>1022</b>	<b>3066</b>
<b>2004</b>	<b>1073</b>	<b>3225</b>
<b>2005</b>	<b>1121</b>	<b>3363</b>
<b>2006</b>	<b>1180</b>	<b>3540</b>
<b>2007</b>	<b>1210</b>	<b>3630</b>
<b>2008</b>	<b>1258</b>	<b>3774</b>
<b>2009</b>	<b>1273</b>	<b>3819</b>
<b>2010</b>	<b>1295</b>	<b>3885</b>
<b>2011</b>	<b>1320</b>	<b>3960</b>
<b>2012</b>	<b>1351</b>	<b>4053</b>
<b>2013</b>	<b>1385</b>	<b>4155</b>
<b>2014</b>	<b>1404</b>	<b>4212</b>
<b>2015</b>	<b>1435</b>	<b>4305</b>
<b>2016</b>	<b>1501</b>	<b>4503</b>



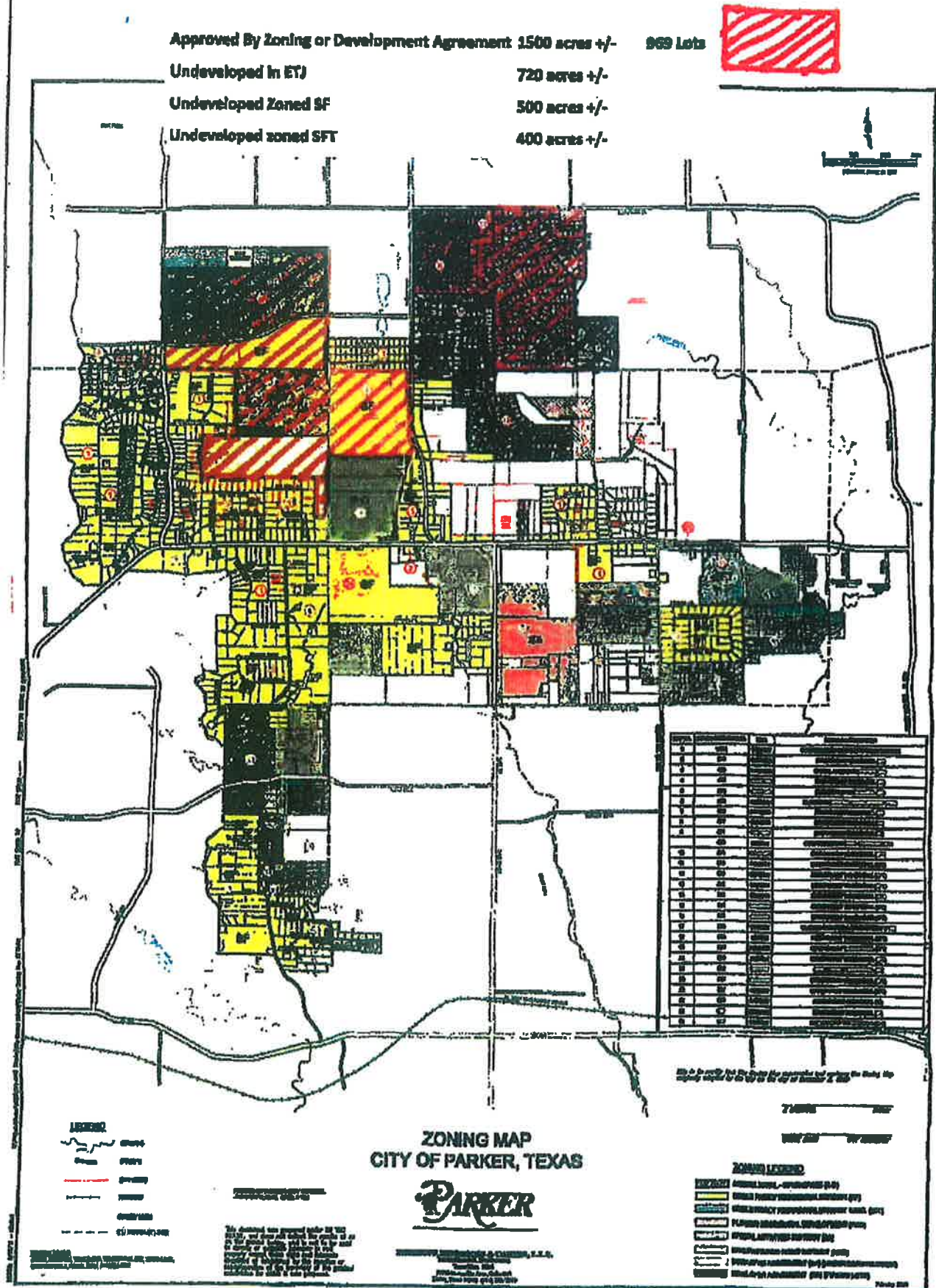






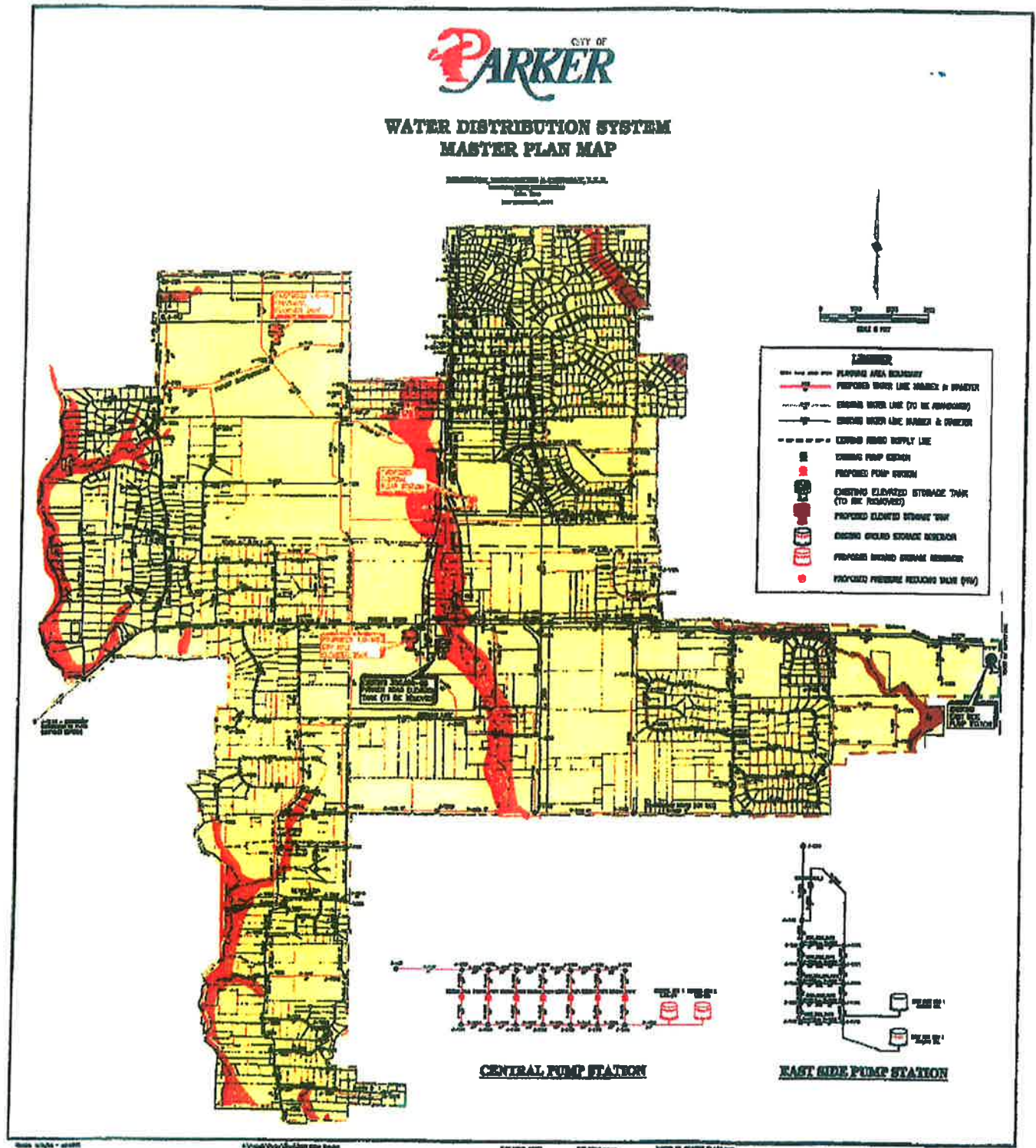


# EXHIBIT 4





# EXHIBIT 5



**E. DEFINITION OF A WATER SERVICE UNIT**

Chapter 395 of the Local Government Code requires that impact fees be based on a defined service unit. A “service unit” means a standardized measure of consumption, use generation, or discharge attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards. The City of Parker has previously defined a water service unit to be a 1-inch water meter and has referred to these service units as Single Family Living Unit Equivalents (SFLUE). The service unit is based on the continuous duty capacity of a 1-inch water meter. This is the typical meter used for a single family detached dwelling within the City, and therefore is considered to be equivalent to one “living unit”. Other meter sizes can be compared to the 1-inch meter through a ratio of water flows as published by the American Water Works Association and shown in Table No. 1 below. This same ratio is then used to determine the proportional water and sewer impact fee amount for each water meter size.

**TABLE NO. 1**  
**LIVING UNIT EQUIVALENCIES**  
**FOR VARIOUS TYPES AND SIZES OF WATER METERS**

<b>Meter Type</b>	<b>Meter Size</b>	<b>Continuous Duty Maximum Rate <sup>(a)</sup></b>	<b>Living Unit Per Meter Size</b>
Simple	1"	25	1.0
Simple	2"	80	3.2
Compound	2"	80	3.2
Turbine	2"	100	4.0

<sup>(a)</sup> Source: AWWA Standard C700 - C702

**F. CALCULATION OF WATER LIVING UNIT EQUIVALENTS 2016-2026**

The City of Parker provided the existing water meter count by size category as of August 2016. In total, there are 1,501 water meters serving the existing population of 4,503 residents and businesses in the Water Service Area. Table No. 2 shows the number of existing meters, the living unit equivalent factor, and the total number of living unit equivalents (LUE's) for water accounts. As shown in Table No. 2, the new LUE's during the impact fee period total 1,129.

**TABLE NO. 2**  
**WATER LIVING UNIT EQUIVALENTS BY METER SIZE**

<b>Meter Size</b>	<b>2016</b>			<b>2026</b>				<b>New Living Units During Impact Fee Period</b>
	<b>Number of Water Meters</b>	<b>Living Unit Equivalent Ratio for 1" Used</b>	<b>Total Number of Living Units</b>	<b>Future Meter Size</b>	<b>Number of Water Meters</b>	<b>Living Unit Equivalent Ratio for 1" Used</b>	<b>Total Number of Living Units</b>	
5/8" x 3/4"	500	1.0	500	1"	742	1.0	742	242
1"	725	1.0	725	1"	1,076	1.0	1,076	351
2"	276	4.0	1,104	2"	410	4.0	1,640	536
<b>Totals</b>	<b>1,501</b>		<b>2,329</b>		<b>2,228</b>		<b>3,458</b>	<b>1,129</b>

## **G. WATER DISTRIBUTION SYSTEM**

Computer models for the years 2016 and 2026 were prepared based on the City's Water Distribution System Master Plan. The models were developed from residential population projections as provided in the Land Use Assumptions Report, prepared by the City of Parker's Impact Fee Advisory Committee. The land areas follow closely to the construction of major facilities in the system as outlined in the Water Distribution Report. These facilities include major distribution lines, pressure reducing valves, pump stations, and ground storage reservoirs.

All computer models were run for a 72-hour Extended Period Simulation to insure proper sizing of the facilities to meet peak demand periods.

### **G.1 Existing Pump Stations, Ground Storage Reservoirs & Elevated Storage Tanks**

The existing water distribution system includes the facilities as shown in Table No. 3 and Table No. 4 below.

**TABLE NO. 3**  
**WATER DISTRIBUTION SYSTEM**  
**EXISTING PUMP STATIONS & GROUND STORAGE**

<b>Pump Station</b>	<b>Number Of Pumps</b>	<b>Rated Capacity (MGD)</b>	<b>Number of Ground Storage Reservoirs</b>	<b>Total Ground Storage Available (MG)</b>
East Side Pump Station	4	3.60	2	0.5
<b>Total:</b>	<b>4</b>	<b>3.60</b>	<b>2</b>	<b>0.5</b>

**TABLE NO. 4**  
**WATER DISTRIBUTION SYSTEM**  
**EXISTING ELEVATED STORAGE**

<b>Pump Station</b>	<b>Capacity (MG)</b>
City Hall Elevated Storage Tank	1.0
<b>Total:</b>	<b>1.0</b>

The pump stations and ground storage facilities were analyzed on the maximum daily demand, while elevated storage acts dynamically and therefore was analyzed utilizing the difference between the Maximum Hourly Demand and the Maximum Daily Demand.

## **G.2 Distribution Lines**

The distribution lines consist of all lines within the service area planning boundary supplying water to customers in the City of Parker. Lines vary in size from 3/4-inch service lines to 18-inch transmission lines. Unless a smaller diameter water line is expected to be constructed by the City of Parker, only those proposed water lines 8-inches in diameter or larger were considered in the Impact Fee calculations. The cost of water lines includes construction cost, appurtenances (water valves, fire hydrants, taps, etc.), utility relocations, purchase of easements and engineering costs. Financing cost is included for each project assuming a bond rate of 5% over a 20-year term.

Unit cost for water lines 12-inches in diameter or larger, which are anticipated to be constructed by private development, include the City's oversize cost participation only. City initiated water lines include the full cost of the proposed facility. Developer initiated water line projects which are 8-inches or less in diameter are not included in this Impact Fee analysis, unless otherwise shown on the CIP map. The cost for these size lines are the responsibility of the developer.

## **H. CAPITAL IMPROVEMENT PLAN**

### **H.1 Executive Summary**

The City of Parker owns and operates their water distribution system comprised of a pumping station, ground storage facilities, elevated storage facility and pipeline infrastructure. This system is being improved and expanded to meet the needs of the water demands imposed by the current residents and future residents of Parker, Texas. A schedule for future improvements and investments in the water distribution system is known as the Capital Improvements Plan. Chapter 395 of the Texas Local Government Code requires the political subdivision create its Capital Improvement Plan to impose impact fees. The Capital Improvement Plan and its costs are required for the calculation of the water impact fee. Birkhoff, Hendricks, and Carter, with assistance of City staff, created the Capital Improvements Plan. Only projects from the Capital Improvement Plan that are required to provide capacity to serve growth during the impact fee (2016-2026) period can be included in the impact fee calculation.

### **H.2 Introduction**

In accordance with Chapter 395 of the Texas Local Government Code, the City of Parker has retained Birkhoff, Hendricks & Carter, L.L.P. to establish the Capital Improvement Plan in conjunction with the Water Impact Fee Study. This section establishes the engineering basis for the capital projects and costs which are included in the water impact fee calculations.

The Capital Improvements Plan consists of the necessary water distribution system improvements to support the projected water demands placed on the distribution system due to future growth. The growth projections were obtained from the Land Use Assumptions Report for the Water Impact Fee prepared by the City of Parker Impact Fee Advisory Committee, dated August 29, 2016.

### H.3 Facility Capacity Requirements

#### H.3.1 General

This section of the report discusses the capacity of those facilities that are required to be included in the Impact Fee Capital Improvements Plan and are also eligible in the calculation of the impact fee. The capacities evaluated are the existing available capacities and the increased capacities due to projected growth. These increased capacities serve the growth projected during the impact fee period.

#### H.3.2 Water Usage

The water distribution system must be improved in accordance with this Capital Improvement Plan in order to support the water demands imposed on the system by the projected growth the City is envisioning within the next 10-year period. The City's existing 2016 residential population is approximately 4,503 residents. In year 2026 the City projects the residential population to grow to approximately 6,969 residents. The City of Parker updated the Water Distribution System Master Plan in February 2016. The Master Plan reports that based on information provided by the City, the residential per capita water usage rate for maximum daily demand is 571 gallons per capita per day (gpcd). Table No. 5 illustrates the water demand rates used to calculate the water demands for the projected population.

**TABLE NO. 5**  
**2016 DESIGN WATER DEMAND RATES**

<b>Land Use</b>	<b>Maximum Daily Demand Rate</b>	<b>Maximum Hourly Demand Rate</b>
Residential	571 g.p.c.d.	1,091 g.p.c.d.
Commercial	1,500 g.p.a.d.	1,950 g.p.a.d.

*g.p.c.d. – gallons per capita per day*

*g.p.a.d. – gallons per acre per day*

*residential peaking factor 1.91*

Table No. 6 summarizes the calculated water demands for year 2016 and 2026, within the City's planning area.

**TABLE NO. 6**  
**WATER DEMANDS**

<b>Water Demand Capacities</b>	<b>Maximum Daily Demand (MGD)</b>	<b>Maximum Hourly Demand (MGD)</b>
2016 Water Demands	3.334	5.521
2026 Water Demands	4.742	8.209
<b>Additional Capacity Required:</b>	<b>1.408</b>	<b>2.688</b>

### H.3.3 Water Supply

The City currently receives treated water supply from the North Texas Municipal Water District (NTMWD) at the East Side Pump Station delivery point located at the southwest corner of the Parker Road and F.M. 1378 intersection. The East Side Pump Station delivery point has capacity to receive up to 3.50 MGD supply rate. It does not have enough capacity to support the additional supply required for the growth within the next ten year period. This site also does not have sufficient area for expansions. Based on the growth projections and the calculated water demands, a second delivery point for water supply will be needed to meet the new water demands. This new delivery point will be the Central Pump Station delivery point. The locations of the existing and proposed delivery points are shown on the Capital Improvement Plan Map included in this report. Table No. 7 summarizes the maximum day supply capacity requirements at each delivery point within the next ten year impact fee period.



**TABLE NO. 7**  
**WATER SUPPLY**

<b>Water Supply Capacities</b>	<b>East Side Supply (MGD)</b>	<b>Central Supply (MGD)</b>
2016 NTMWD Supply	3.50	0.00
2026 NTMWD Supply	3.50	1.75
<b>Additional Supply Capacity Required:</b>	<b>0.00</b>	<b>1.75</b>

#### H.3.4 Water Distribution System

The City's existing water distribution system can support the water demands applied to the system from the existing residential population. As the City grows within the next ten-year period, additional water distribution system facilities will need to be constructed to support water demand created from new growth. In addition to facilities, the water distribution system will require additional water lines.

The design of the proposed water distribution system is based on three separate demand conditions. The first condition is based on the maximum daily demand. This demand is the rate at which water is supplied and the rate which pump stations must be sized to deliver water to the system. The second condition is the maximum hourly demand rate on the day of maximum demand. Maximum hourly demand rate is used to size distribution lines and to determine the volume of elevated storage. The third condition used is the minimum hourly demand rate on the day of maximum demand. This rate is used to analyze the refill rates of elevated storage tanks. These three demand conditions were modeled over a three-day period with an Extended Period Simulation (EPS) in the hydraulic water model utilizing the H2O NET water model software.

The existing and proposed distribution lines along with facilities are shown on the Capital Improvement Plan Map presented in this section of the Impact Fee Report. The 72-hour EPS model was utilized with the use of a diurnal curve obtained from the 2016 Master Plan Update model for the 2016 and 2026 hydraulic models. Table No. 8 summarizes the maximum hourly demands that the proposed distribution system will need to support.

**TABLE NO. 8**  
**WATER LINE DEMANDS**

<b>Waterline Capacities</b>	<b>Maximum Hourly Demand (MGD)</b>
2016 Waterline Demands	5.521
2026 Waterline Demands	8.209
<b>Addition Waterline Capacity Required:</b>	<b>2.688</b>

### H.3.5 High Service Pump Stations

The City currently meets its pumping system demand requirements with the existing East Side Pump Station. This pump station has a firm pumping capacity of 3.60 MGD with the largest pump on standby to meet the Texas Commission on Environmental Quality (TCEQ) regulations. In order to meet the projected maximum daily demands, a second pump station with an initial firm capacity of 1.75 MGD will be required to be in service by year 2020 to meet the additional maximum daily demands. Table No. 9 summarizes the pump station capacities.

**TABLE NO. 9**  
**PUMP STATIONS**

<b>Pump Station Capacities</b>	<b>East Side Pump Station (MGD)</b>	<b>Central Pump Station (MGD)</b>
2016 Pumping Capacity	3.50	0.00
2026 Pumping Capacity	0.00	1.75
<b>Additional Pumping Capacity Required:</b>	<b>0.00</b>	<b>1.75</b>

### H.3.6 Ground Storage Reservoirs

Ground Storage within the system is necessary to provide a dependable supply and during periods of interruption in supply. The volume of ground storage was designed for a 6-hour drawdown for the maximum demand pumping. The East Side Pump Station currently has a 200,000-gallon and a 300,000-gallon ground storage reservoir. These two existing reservoirs serve the East Side delivery point and pump station.

The new delivery point will require additional ground storage to meet TCEQ regulations and to provide a dependable supply to the Central Pump Station. Table No. 10 illustrates the ground storage capacity requirements. The ground storage reservoir at the Central Pump Station will need to be constructed congruently with the proposed pump station.

**TABLE NO. 10**  
**GROUND STORAGE RESERVOIR REQUIREMENTS**

<b>Ground Storage Capacities</b>	<b>Ground Storage Added (MG)</b>	<b>Ground Storage Available (MG)</b>
2016 Ground Storage Capacity	0.00	0.50
2026 Ground Storage Capacity	0.75	0.75
<b>Reservoir Capacity Required:</b>	<b>0.75</b>	<b>1.25</b>

### H.3.7 Elevated Storage Tanks

Elevated storage within the system is required by TCEQ to maintain system pressure. In the Parker system, elevated storage is sized to meet the maximum hourly demands working in conjunction with the pump stations, while maintaining system pressures.

The City currently has one 1.0-MG elevated storage tank located on Parker Road, adjacent to City Hall, with a high water level at 800-ft above mean sea level (MSL). Table No. 11 summarizes the elevated storage requirements to meet maximum hourly demand rates within the 10-year study period.

**TABLE NO. 11**  
**ELEVATED STORAGE TANK REQUIREMENTS**

<b>Elevated Storage Capacities</b>	<b>Elevated Storage Added (MG)</b>	<b>Elevated Storage Available (MG)</b>
2016 Elevated Storage Capacities	0.00	1.00
2026 Elevated Storage Capacities	0.00	1.00
<b>Elevated Storage Capacity Required:</b>	<b>0.00</b>	<b>1.00</b>

#### H.4 Facilities – Utilized Capacity

Utilized capacity for the water distribution system was calculated based on the size of water line required for each model year (2016, 2026 and build-out). Master planning of the water distribution system is based on the 72-hour extended period simulation (EPS). The pump stations' capacities are generally based on the maximum daily system demand while transmission and distribution facilities are sized based on either the maximum hourly demand or the minimum hourly demand, whichever demand is greater for a particular water line. Often times, the capacity of a water line is determined by the flows generated by the minimum hourly demand. The minimum hourly flows are usually higher in those lines which are used to refill elevated storage. Table No. 12 below shows the unit flows used for analysis of each element of the distribution system.

**TABLE NO. 12**  
**WATER DISTRIBUTION SYSTEM ANALYSIS**  
**BASIS OF DEMAND CALCULATION**

Type of Facilities	Demand Type	Impact Fee Per Capita Use
Pumping	Maximum Day	571 gallons/day
Distribution System	Maximum Hour	1091 gallons/day
Ground Storage	Maximum Day x 6/24 Hours	
Elevated Storage	Maximum Hour - Maximum Day x 6/24 Hours	

For each line segment in the water distribution model, the build-out flow rate in any given line was compared to the flow rate in the same line for the 2016 and the 2026 models. The utilized capacity was then calculated for each year based on the build-out being 100% capacity. The utilized capacity during the Impact Fee period is the difference between the year 2016 percent utilized and the year 2026 percent utilized. The utilized capacity for each water distribution facility, both existing and proposed, is presented in detail in the Impact Fee Capacity Calculation Tables. Table No. 14 on page 27 summarizes the project cost and utilized cost over the impact fee period of 2016 - 2026 for each element of the Water Distribution System.

#### H.4.1 General

This section of the report discusses the water distribution system utilized facilities that are eligible to be included in the Impact Fee Capital Improvements Plan and are also eligible in the calculation of the impact fee. The Capital Improvements Plan makes improvements the water distribution system in order to meet and support the additional water demands created by the projected growth during the 10-year impact fee period. Only the infrastructure and facility projects identified in the Capital Improvements Plan can be eligible for impact fee funding.

#### H.4.2 Water Supply

The City will continue to receive water supply from the North Texas Municipal Water District. The new delivery point will be the Central Pump Station delivery point. For the year 2016, the utilized capacity is 0% since it is not constructed yet. For the year 2026, the utilized capacity was calculated by dividing the 2026 maximum daily demand by the buildout maximum daily demand, then subtracting the utilized capacities (2026-2016). Its utilized capacity during the 10-year period is approximately 62.0%.

$$2016 \text{ Utilized Capacity} = 0.0\%$$

$$2026 \text{ Utilized Capacity} = 2026 \text{ Max Daily Demand} / \text{Buildout Max Daily Demand}$$

$$\begin{aligned} 2026 \text{ Utilized Capacity} &= 4.742 \text{ MGD} / 7.645 \text{ MGD} \times 100\% \\ &= 62.0\% \end{aligned}$$

$$\text{Utilized Capacity during Capital Recovery Fee (CRF) Period} = 62.0\% - 0.0\% = 62.0\%$$

#### H.4.3 Water Distribution System

The utilized capacity of the water distribution system water lines is associated with waterlines that are 8-inches in diameter or larger. The water distribution system was modeled in the hydraulic modeling software for the existing year 2016 water model, the 10-year 2026 water model, and the buildout water model. The utilized capacity for the new waterlines was obtained by comparing the maximum hourly flows in the new pipes, between the three water models. For the year 2016, the utilized capacity

of the new pipes was 0.0% since they are not serviced yet. For the year 2026, the utilized capacity was calculated by dividing the year 2026 pipe flow with the buildout pipe flow, both obtained from the hydraulic water model pipe line flows. The following are the proposed distribution lines that are shown on the Capital Improvement Plan Map in report.

- 1) **Dillehay Drive 18-Inch Water Line:** This waterline project consists of approximately 2,490 linear feet of 18-inch waterline beginning at the new Central Pump station, bearing south along Dillehay Drive and terminating at Parker Road by connecting to an existing 12-inch waterline. **Its utilized capacity during CRF period was calculated to be 100%.**

**Dillehay Drive 18-Inch Water Line:** This waterline project consists of approximately 1,635 linear feet of 18-inch waterline beginning at the new Central Pump station, bearing north along Dillehay Drive and terminating just north of Curtis Road by connecting to the existing 16-inch waterline. **Its utilized capacity during the CFR period was calculated to be 71.0%.**

- 2) **Chaparral Elevated Storage Tank Waterline:** This waterline project consists of approximately 385 linear feet of 16-inch waterline from the new elevated tank to connect to the existing 16-inch waterline. **Its utilized capacity during the CFR period was calculated to be 62.0%.**

- 3) **Bois-D-Arc Lane 8-inch Waterline:** This waterline project consists of approximately 1,670 linear feet of 8-inch waterline required along Bois-O-Arc Road for the new pressure reducing valve vault to be in place and operational within the next 10 years. **Its utilized capacity during the CFR period was calculated to be 62.0% utilized by the year 2026.**

#### H.4.4 High Service Pump Stations

The new Central Pump Station will have an initial firm pumping capacity of 1.75 MGD to meet the additional water demands within the next ten-year period. For the year 2016, the utilized capacity is 0.0% since it is not constructed yet. For the year 2026 the utilized capacity was calculated by dividing the 2026 maximum daily

demand by the buildout maximum daily demand, then subtracting the utilized capacities (2026-2016). Its utilized capacity during the 10-year period is approximately 62.0%.

$$2016 \text{ Utilized Capacity} = 0.0\%$$

$$2026 \text{ Utilized Capacity} = 2026 \text{ Max Daily Demand} / \text{Buildout Max Daily Demand}$$

$$\begin{aligned} 2026 \text{ Utilized Capacity} &= 4.742 \text{ MGD} / 7.645 \text{ MGD} \times 100\% \\ &= 62.0\% \end{aligned}$$

$$\text{Utilized Capacity during Capital Recovery Fee (CRF) Period} = 62.0\% - 0.0\% = 62.0\%$$

#### H.4.5 Ground Storage Reservoirs

The new Central delivery point and pump station will required additional ground storage to meet TCEQ regulations and to provide a dependable supply for the Central Pump Station. The utilized capacity for the Central Ground Storage Reservoir was calculated the same as for the pump station utilized capacity above which is based on the maximum daily demands and calculating the differences between the 10-year period, then subtracting the utilized capacities (2026-2016). Its utilized capacity during the 10-year period is approximately 62.0%.

$$2016 \text{ Utilized Capacity} = 0.0\%$$

$$2026 \text{ Utilized Capacity} = 2026 \text{ Max Daily Demand} / \text{Buildout Max Daily Demand}$$

$$\begin{aligned} 2026 \text{ Utilized Capacity} &= 4.742 \text{ MGD} / 7.645 \text{ MGD} \times 100\% \\ &= 62.0\% \end{aligned}$$

$$\text{Utilized Capacity during Capital Recovery Fee (CRF) Period} = 62.0\% - 0.0\% = 62.0\%$$

#### H.4.6 Elevated Storage Tanks

The existing 1.0 MG Elevated Tank has the capacity to support maximum hourly demands imposed by the projected growth within the next ten years. The utilized capacity for the elevated tank was calculated based on the maximum hourly demands and finding the differences between the 10-year periods. For the year (2016 and

2026) the utilized capacity of the elevated storage tank was calculated by subtracting the max hour demand from the max day demand and dividing the difference by 4 (4 is a constant rate 4-MGD/1-MG) to convert from rate to volume. The 2026 required volume was then divided by the buildout volume required to obtain the utilized capacity. Its utilized capacity during the 10-year period is approximately 32.0%.

$$\begin{aligned}
 \text{2016 Utilized Capacity} &= (\text{2016 Max Hour Demand} - \text{Max Day Demand}) / 4 \\
 &= (5.521 \text{ MGD} - 3.334 \text{ MGD}) / 4 \\
 &= 2.190 \text{ MGD} / 4 \\
 &= 0.55 \text{ MG}
 \end{aligned}$$

$$\begin{aligned}
 \text{2016 Utilized Capacity} &= \text{2016 Required Volume} / \text{Available Volume} \\
 &= 0.55 \text{ MG} / 1.0 \text{ MG} \times 100\% \\
 &= 55\%
 \end{aligned}$$

$$\begin{aligned}
 \text{2026 Utilized Capacity} &= (\text{2026 Max Hour Demand} - \text{Max Day Demand}) / 4 \\
 \text{2026 Utilized Capacity} &= (8.209 \text{ MGD} - 4.742 \text{ MGD}) / 4 \\
 &= 3.467 / 4 \\
 &= 0.87 \text{ MG}
 \end{aligned}$$

$$\begin{aligned}
 \text{2026 Utilized Capacity} &= \text{2026 Required Volume} / \text{Available Volume} \\
 \text{2026 Utilized Capacity} &= 0.87 \text{ MG} / 1.0 \text{ MG} \times 100\% \\
 &= 87\%
 \end{aligned}$$

Utilized Capacity during Capital Recovery Fee (CRF) Period = 32%

#### H.4.7 Capital Improvement Plan Map

The Capital Improvements required within the 10-year period to support the City's projected growth are shown in Figure No. 1 on the following page.

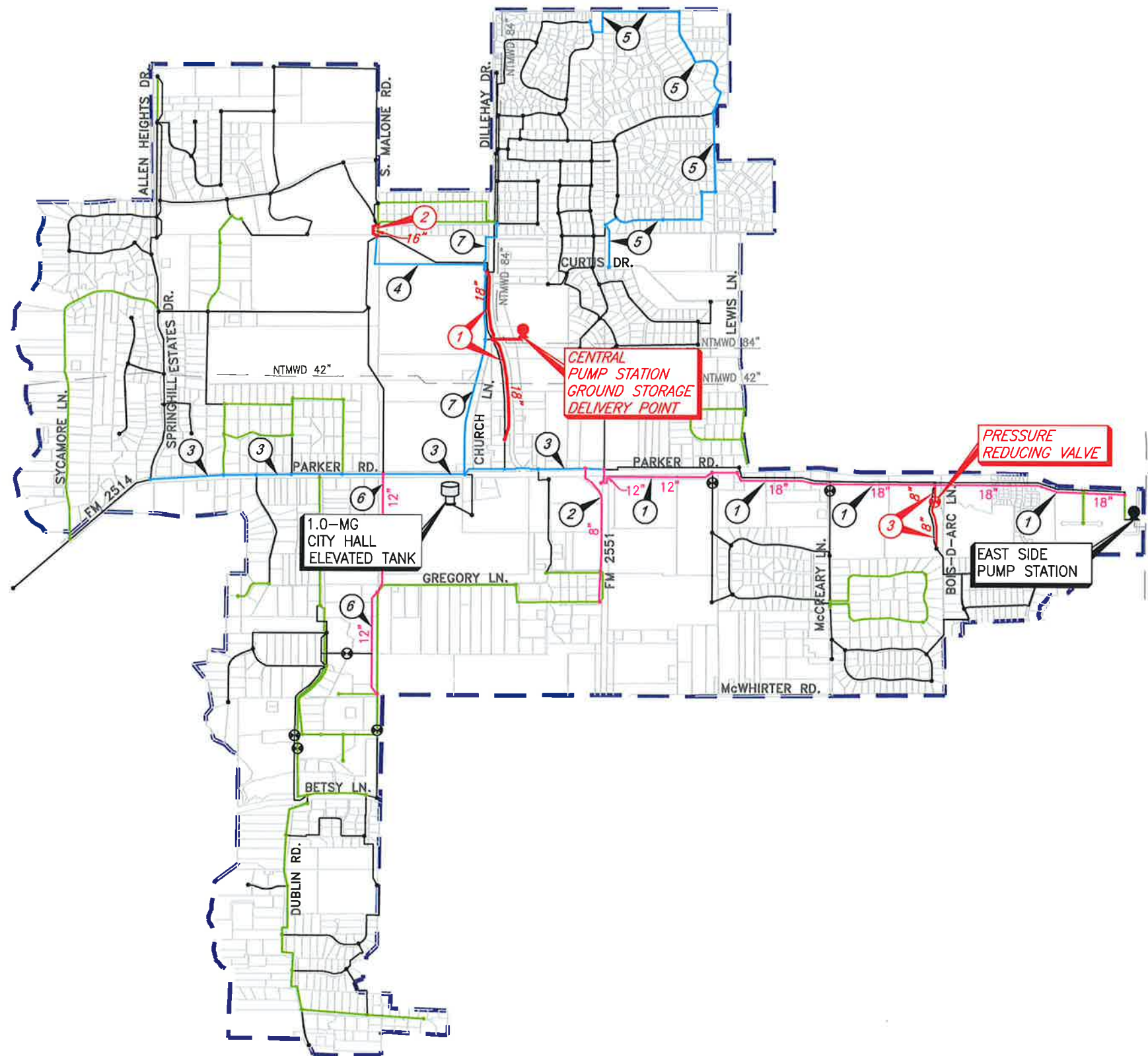
### H.5 Capital Improvement Plan Map

See Attached Map.



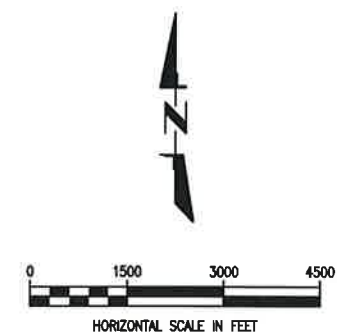


# WATER DISTRIBUTION SYSTEM 2016-2026 WATER IMPACT FEE CAPITAL IMPROVEMENT PLAN AND RECOVERY WATERLINE MAP



## LEGEND

- PLANNING AREA BOUNDARY
- EXISTING WATER LINE (NO IMPACT FEE)
- EXISTING WATER LINE (IMPACT FEE)
- PROPOSED WATER LINE (IMPACT FEE)
- CITY PARTICIPATED IN OVERSIZE COST (IMPACT FEE)
- CITY PURCHASED FROM PECAN ORCHARD (IMPACT FEE)
- EXISTING NTMWD SUPPLY LINE
- EXISTING PUMP STATION
- PROPOSED PUMP STATION
- EXISTING ELEVATED STORAGE TANK
- EXISTING PRESSURE REDUCING VALVE
- PROPOSED PRESSURE REDUCING VALVE
- EXISTING WATER LINE (IMPACT FEE)
- PROPOSED WATER LINE PROJECTS



BIRKHOFF, HENDRICKS & CARTER, L.L.P.  
PROFESSIONAL ENGINEERS  
DALLAS, TEXAS

FEBRUARY, 2017

## H.6 Capital Improvement Plan Schedule

The following table No. 13 illustrates the projected Capital Improvement Plan schedule. This schedule correlated to the projected growth in the Land Use Assumptions report. The City will need to evaluate the yearly growth projections to determine if the schedule below needs to be revised accordingly to development growth.

**TABLE NO. 13**  
**CAPITAL IMPROVEMENTS PLAN SCHEDULE**

Facility	Start Design	Start Construction	In Service
Central Pump Station	Mid 2017	Mid 2018	2020
Water Supply and Distribution Lines	Early 2017	Mid 2018	2020
Central 0.75 MG Ground Storage No. 1	Mid 2017	Mid 2018	2020
NTMWD Metered Station	Mid 2017	Mid 2028	2020

## H.7 Capital Improvement Plan Cost

In order to meet the demands of the anticipated growth over the next 10-years, as provided in the Land Use Assumption Report, certain water distribution system improvements are required. These recommended improvements form the basis for the Water Distribution System Impact Fee Calculation and totals \$6,542,700. Adding the cost of financing brings the total 10-year Water Distribution System Capital Improvement cost to \$10,468,611. Table No. 15 represents a summary of the existing and proposed facilities capital costs within the planning period.

The existing facilities that were determined to be impact fee eligible due to available capacity that can be utilized to support growth were included in the impact fee calculations. The actual cost of construction for these facilities were used in the calculations when known. Existing eligible infrastructure without available project costs were estimated based on average unit cost.

The average unit cost for the proposed capital improvement projects and the existing facilities was derived from a limited survey of projects, which bid recently, plus an estimated cost for engineering, easements and debt service. The cost and the utilized capacity of the proposed water lines, pump stations, ground storage reservoirs elevated storage tanks and existing facility proposed improvements during the impact fee period are included in Table No. 14.

**TABLE No. 14**  
**CITY OF PARKER, TEXAS**  
**2016 IMPACT FEE**  
**WATER DISTRIBUTION SYSTEM**  
**10-YEAR CAPITAL IMPROVEMENT PLAN**

**PROPOSED WATER LINES**

Project No. <sup>(3)</sup>	Project	Size	Opinion of Project Cost <sup>(1)</sup>	Debt Service <sup>(2)</sup>	Total Project Cost
1	Dillehay Drive 18-Inch Water Line	18"	\$ 577,500	\$ 349,302	\$ 926,802
2	Chaparral Elevated Storage Tank 16-Inch Water Line	16"	\$ 46,200	\$ 27,944	\$ 74,144
3	Bois-D-Arc Lane 8-Inch Water Line	8"	\$ 167,000	\$ 101,010	\$ 268,010
<b>Subtotal: Proposed Water Lines</b>			<b>\$ 790,700</b>	<b>\$ 478,256</b>	<b>\$ 1,268,956</b>

**SUPPLY, PUMPING, STORAGE FACILITIES AND FACILITY IMPROVEMENTS**

Project No. <sup>(4)</sup>	Project	Capacity	Opinion of Project Cost <sup>(1)</sup>	Debt Service <sup>(2)</sup>	Total Project Cost
4		0 1.75 MGD	\$ 3,150,000	\$ 1,905,283	\$ 5,055,283
5		0 0.75 MG	\$ 990,000	\$ 598,803	\$ 1,588,803
6		0 5 MGD	\$ 1,320,000	\$ 798,404	\$ 2,118,404
7		0 -----	\$ 240,000	\$ 145,164	\$ 385,164
<b>Subtotal, Supply, Pumping and Storage Facilities:</b>			<b>\$ 5,700,000</b>	<b>\$ 3,447,655</b>	<b>\$ 9,147,655</b>

**PLANNING EXPENSES**

Project No.	Project	Opinion of Cost (1)(b)	Debt Service <sup>(2)</sup>	Total Project Cost
	Water System Master Plan	\$ 32,000	\$ -	\$ 32,000
	Water Impact Fee	\$ 20,000	\$ -	\$ 20,000
<b>Subtotal, Planning Expenses:</b>		<b>\$ 52,000</b>	<b>\$ -</b>	<b>\$ 52,000</b>
<b>Water Distribution System CIP Grand Total:</b>		<b>\$ 6,542,700</b>	<b>\$ 3,925,911</b>	<b>\$ 10,468,611</b>

**Notes:**

- (1) Opinion of Project Cost includes:
  - a) Engineer's Opinion of Construction Cost
  - b) Professional Services Fees (Survey, Engineering, Testing, Legal)
  - c) Cost of Easement or Land Acquisitions
- (2) Debt Service based on 20-year simple interest bonds at 5%
- (3) \* - Developer Initiated Construction of 8-inch Waterline, City Participation in Oversize Cost
- (4) \* - City Initiated Construction

**H.8 Utilized Capacity Costs**

**TABLE NO. 15**  
**SUMMARY OF ELIGIBLE CAPITAL COST & UTILIZED CAPACITY COST**

<b>Water System</b>	<b>Total Capital Cost (\$)</b>	<b>Total 20-Year Project Cost (\$)</b>	<b>Utilized Capacity During Fee Period (\$)</b>
Existing Water Lines	\$ 2,259,443	\$ 3,580,694	\$ 635,007
Existing Water Facilities	\$ 3,494,971	\$ 5,511,919	\$ 1,503,201
<b>Existing Water System Subtotal:</b>	<b>\$ 5,754,413</b>	<b>\$ 9,092,613</b>	<b>\$ 2,138,208</b>
Proposed Water Lines	\$ 790,700	\$ 1,268,956	\$ 1,032,405
Proposed Water Facilities	\$ 5,700,000	\$ 9,147,655	\$ 5,671,546
Master Plan & Impact Fee Expenses	\$ 52,000	\$ 52,000	\$ 52,000
<b>Proposed Water System Subtotal:</b>	<b>\$ 6,542,700</b>	<b>\$ 10,468,611</b>	<b>\$ 6,755,951</b>
<b>TOTAL:</b>	<b>\$ 12,297,113</b>	<b>\$ 19,561,224</b>	<b>\$ 8,894,160</b>

## I. CALCULATION OF MAXIMUM WATER IMPACT FEES

The maximum impact fees for the water distribution system is calculated by dividing the cost of the capital improvements or facility expansions necessitated and attributable to new development in the service area within the 10-year period by the number of living units anticipated to be added to the City within the 10-year period as shown on Table No. 16. The calculations are shown below.

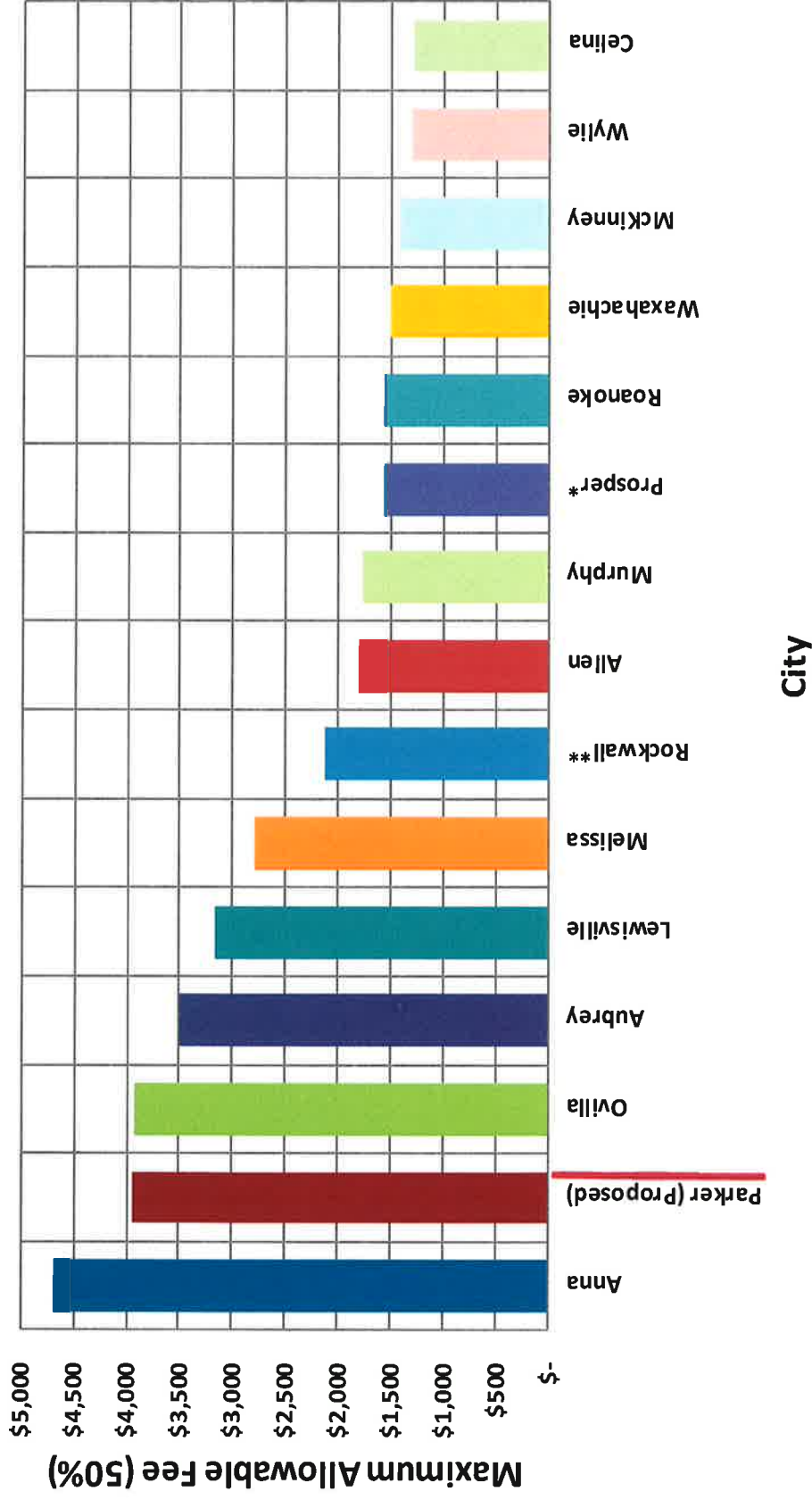
**TABLE NO. 16**  
**MAXIMUM ALLOWABLE WATER IMPACT FEE**

<b>Maximum Water Impact Fee</b> = $\frac{\text{Eligible Existing Utilized Cost} + \text{Eligible Proposed Utilized Cost}}{\text{Number of New Living Unit Equivalent over the Next 10 Years}}$			
=	\$2,138,208	+	\$6,755,951
		1,129	\$8,894,160
			1,129
<b>Maximum Impact Fee</b> =	<b><u>\$7,877.91</u></b>		
<b>Allowable Maximum Water Impact Fee: (Max Impact Fee x 50% )*</b> =			<b><u>\$3,938.95</u></b>
* Maximum allowable impact fee is 50% of the maximum calculated impact fee per Chapter 395 LGC			

Figure No. 2 is a comparison graph of maximum water impact fees calculated for cities in North Central Texas compared to the City of Parker.

Based on the Maximum Impact Fee Calculation for Water, Table No. 17 calculates the maximum impact fee for the various sizes of water meters.

## Water Impact Fee Comparison



\*Impact fee based on 5/8" meter.

\*\*Impact fee based on 1" meter.

FIGURE NO. 2

**TABLE NO. 17**  
**ALLOWABLE MAXIMUM FEE PER LIVING UNIT EQUIVALENT**  
**AND**  
**PER METER SIZE AND TYPE**

**50% Max . Water Impact fee /LUE** **\$ 3,938.95**

Typical Land Use	Meter Type	Meter Size	LUE	Maximum Water	
				Impact Fee	
Single Family Residential	Simple	1"	1	\$	3,938.95
Single Family Residential	Simple	2"	4	\$	15,755.82

***APPENDIX***  
***WATER IMPACT FEE UTILIZED***  
***CAPACITY TABLES***



**TABLE NO. 18**  
**CITY OF PARKER, TEXAS**  
**2016 WATER SYSTEM IMPACT FEE STUDY**  
**EXISTING WATER LINES**

Pipe Number	Length (Ft.)	Diameter (Inches)	Date of Const.	Avg. Unit Cost (\$/Ft.)	Construction Cost (\$)	20 Year Debt Service Utilizing Simple Interest	Total 20 Year Project Cost (\$)	(%) Utilized Capacity			(\$ Utilized Capacity		
								2016	2026	During Fee Period	2016	2026	During Fee Period
1 - Parker Road 12 & 18-Inch Water Line (East Side P.S. to F.M. 2551)													
P-1078	358	12	0	\$61.79	\$22,119	\$13,379	\$35,498	100%	100%	0%	\$35,498	\$35,498	\$0
P-1084	2,615	12	0	\$61.79	\$161,569	\$97,726	\$259,295	100%	100%	0%	\$259,295	\$259,295	\$0
P-1271	7,903	18	0	\$61.79	\$488,292	\$295,344	\$783,636	100%	100%	0%	\$783,636	\$783,636	\$0
P-1289	2,072	18	0	\$61.79	\$128,020	\$77,433	\$205,453	100%	100%	0%	\$205,453	\$205,453	\$0
Subtotal:	12,948				\$800,000	\$483,881	\$1,283,881				\$1,283,882	\$1,283,882	\$0
2 - F.M. 2551 8-Inch Water Line													
P-1035	3,315	8	0	\$77.08	\$255,515	\$154,549	\$410,063	57%	100%	43%	\$233,736	\$410,063	\$176,327
Subtotal:	3,315				\$255,515	\$154,549	\$410,063				\$233,736	\$410,063	\$176,327
3 - Parker Road 12-Inch Water Line (F.M. 2551 to Springhill Estates Drive)													
P-1068	1,989	12	0	\$30.00	\$59,670	\$36,092	\$95,762	100%	100%	0%	\$95,762	\$95,762	\$0
P-1069	585	12	0	\$30.00	\$17,550	\$10,615	\$28,165	100%	100%	0%	\$28,165	\$28,165	\$0
P-1070	1,008	12	0	\$30.00	\$30,240	\$18,291	\$48,531	100%	100%	0%	\$48,531	\$48,531	\$0
P-1071	560	12	0	\$30.00	\$16,800	\$10,162	\$26,962	100%	100%	0%	\$26,962	\$26,962	\$0
P-1072	645	12	0	\$30.00	\$19,350	\$11,704	\$31,054	100%	100%	0%	\$31,054	\$31,054	\$0
P-1073	1,009	12	0	\$30.00	\$30,270	\$18,309	\$48,579	100%	100%	0%	\$48,579	\$48,579	\$0
P-1074	944	12	0	\$30.00	\$28,320	\$17,129	\$45,449	96%	98%	2%	\$43,631	\$44,540	\$909
P-1075	812	12	0	\$30.00	\$24,360	\$14,734	\$39,094	100%	100%	0%	\$39,094	\$39,094	\$0
P-1076	953	12	0	\$30.00	\$28,590	\$17,293	\$45,883	100%	100%	0%	\$45,883	\$45,883	\$0
P-1077	596	12	0	\$30.00	\$17,880	\$10,815	\$28,695	100%	100%	0%	\$28,695	\$28,695	\$0
P-1178	1,927	12	0	\$30.00	\$57,810	\$34,966	\$92,776	95%	100%	5%	\$88,138	\$92,776	\$4,639
Subtotal:	11,028				\$330,840	\$200,109	\$530,949				\$524,494	\$530,041	\$5,548
4 - Chaparral Elevated Storage Tank 16-Inch Water Line													
P-1260	2,956	16	0	\$33.83	\$100,000	\$60,485	\$160,485	6%	71%	65%	\$9,629	\$113,944	\$104,315
Subtotal:	2,956				\$100,000	\$60,485	\$160,485				\$9,629	\$113,944	\$104,315
5 - Muddy Creek 12-Inch Water Line													
P-1169	2,780	12	0	\$30.00	\$83,400	\$50,445	\$133,845	100%	100%	0%	\$133,845	\$133,845	\$0
P-1170	3,035	12	0	\$30.00	\$91,050	\$55,072	\$146,122	34%	100%	66%	\$49,681	\$146,122	\$96,440
P-1171	1,890	12	0	\$30.00	\$56,700	\$34,295	\$90,995	37%	100%	63%	\$33,668	\$90,995	\$57,327
P-1176	325	12	0	\$30.00	\$9,750	\$5,897	\$15,647	67%	88%	21%	\$10,484	\$13,770	\$3,286
P-1280	1,570	12	0	\$30.00	\$47,100	\$28,489	\$75,589	0%	91%	91%	\$0	\$68,786	\$68,786
P-1317	3,350	12	0	\$30.00	\$100,500	\$60,788	\$161,288	64%	90%	26%	\$103,224	\$145,159	\$41,935
P-1319	320	12	0	\$30.00	\$9,600	\$5,807	\$15,407	60%	100%	40%	\$9,244	\$15,407	\$6,163
P-1321	990	12	0	\$30.00	\$29,700	\$17,964	\$47,664	61%	75%	14%	\$29,075	\$35,748	\$6,673
Subtotal:	14,260				\$427,800	\$258,756	\$686,556				\$369,221	\$649,832	\$280,610

**TABLE NO. 18**  
**CITY OF PARKER, TEXAS**  
**2016 WATER SYSTEM IMPACT FEE STUDY**  
**EXISTING WATER LINES**

Pipe Number	Length (Ft.)	Diameter (Inches)	Date of Const.	Avg. Unit Cost (\$/Ft.)	Construction Cost (\$)	20 Year Debt Service Utilizing Simple Interest	Total 20 Year Project Cost (\$)	(%) Utilized Capacity			(\$ Utilized Capacity		
								2016	2026	During Fee Period	2016	2026	During Fee Period
6 - 2009 12-Inch Water Line Phase-2													
P-1181	2,419	12	2009	\$50.43	\$121,996	\$73,789	\$195,785	54%	70%	16%	\$105,724	\$137,050	\$31,326
P-1254	2,940	12		\$50.43	\$148,271	\$89,682	\$237,953	71%	75%	4%	\$168,947	\$178,465	\$9,518
Subtotal:	5,359				\$270,267	\$163,471	\$433,738				\$274,671	\$315,515	\$40,844
7 - Church Road Waterline													
P-1080	3,124	12	2002	\$15.72	\$49,113	\$0	\$49,113	58%	100%	42%	\$28,485	\$49,113	\$20,627
P-1220	1,648	12		\$15.72	\$25,908	\$0	\$25,908	71%	97%	26%	\$18,395	\$25,131	\$6,736
Subtotal:	4,772				\$75,021	\$0	\$75,021				\$46,880	\$74,244	\$27,363
Total:	54,638				\$2,259,443	\$1,321,251	\$3,580,694				\$2,742,513	\$3,377,521	\$635,007

**TABLE NO. 19**  
**CITY OF PARKER, TEXAS**  
**2016 WATER DISTRIBUTION IMPACT FEE STUDY**  
**EXISTING WATER SUPPLY, PUMPING AND STORAGE FACILITIES**

Pump Station Improvements	Year Const.	Capacity	Units	Pump Station Cost (\$)				Capacity Utilized (%)			Capacity Utilized (\$)	
				Construction Cost (\$)	Engineering, Testing and Property Acquisition	Debt Service Interest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost (\$)	In The CRF Period		2016	2026
									2016	2026		
Existing Pump Stations, Ground Storage, and Elevated Storage Facilities												
Facilities & Water Line Purchase From Pecan Orchard	1988	-----	-----	\$196,000	\$0	Special	\$21,560	\$217,560	100%	100%	\$217,560	\$0
East Side Pump Station Improvements	2003	3.60	MGD	\$396,700	\$79,340	5%	\$287,934	\$763,974	93%	100%	\$710,495	\$53,478
City Hall Elevated Storage Tank	2011	1.0	MG	\$2,352,442	\$470,488	5%	\$1,707,455	\$4,530,385	55%	87%	\$2,491,712	\$1,449,723
Existing Facilities Total:				\$2,945,142	\$549,828		\$2,016,948	\$5,511,919			\$3,419,767	\$1,503,201

**TABLE NO. 20**  
**CITY OF PARKER, TEXAS**  
**2016 WATER SYSTEM IMPACT FEE STUDY**  
**PROPOSED WATER LINES**

*\*\* Average Unit costs are based in 2016 dollars unless otherwise indicated and includes 20% for engineering and easen*

Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost (\$/Ft.)	Construction Cost (\$)	20 Year Debt Service @ 5% Simple Interest	Total 20 Year Project Cost (\$)	(%) Utilized Capacity			(\$ Utilized Capacity		
							2016	2026	During Fee Period	2016	2026	During Fee Period
1 - Dillehay Drive 18-Inch Water Line												
This project begins at the proposed Central Pump Station and bears north and south. The northern segment terminates near Kara Lane approximately 1,500 feet south of Chapparral while the southern segment continues to just south of Lindsey Lane approximately 2,000 feet north of Parker Road.												
2	P-1252	2,490	18"	\$140.00	\$348,600	\$210,851	\$559,451	0.0%	100.0%	100.0%	\$0	\$559,451
2	P-1253	1,635	18"	\$140.00	\$228,900	\$138,451	\$367,351	0.0%	71.0%	71.0%	\$0	\$260,819
Subtotal:							\$577,500	\$349,302			\$0	\$820,270
2 - Chaparral Elevated Storage Tank 16-Inch Water Line												
This water line begins at the proposed Chaparral Elevated Storage Tank and continues northerly connecting to the existing 16-inch water line at the intersection of Malone Drive and Neatdown Road.												
2	P-11191	385	16"	\$120.00	\$46,200	\$27,944	\$74,144	0.0%	62.0%	62.0%	\$0	\$45,969
Subtotal:							\$46,200	\$27,944			\$0	\$45,969
3 - Bois-D-Arc Lane 8-Inch Water Line												
The water line begins at a point for connection to the existing 18-inch Parker Road Water Line and continues southerly connecting to the existing 8-inch water line south of Bois-D-Arc Lane.												
2	P-1157	1,670	8"	\$100.00	\$167,000	\$101,010	\$268,010	0.0%	62.0%	62.0%	\$0	\$166,166
Subtotal:							\$167,000	\$101,010			\$0	\$166,166
CIP Total:							\$790,700	\$478,256			\$0	\$1,032,405

1 - City Participate in Cost Oversize

2 - City Initiated & Funded

**TABLE NO. 21**  
**CITY OF PARKER, TEXAS**  
**2016 WATER DISTRIBUTION IMPACT FEE STUDY**  
**PROPOSED WATER FACILITIES**

Facility Improvements	Year Const.	Projected Capacity	Units	Water Facilities Cost (\$)				Total 20 Yr. Project Cost (\$)	Capacity Utilized (MGD)		Capacity Utilized (%)		Capacity Utilized (\$)		
				Capital Cost (\$)	Engineering, Testing and Property Acquisition 20% (\$)	Opinion of Project Total Cost (\$)	20 Year Debt Service Utilizing 5% Simple Interest (\$)		2016	2026	In The CRF Period	2016	2026	In The CRF Period	
Proposed Pump Stations, Ground Storage, and Elevated Storage															
8. Central Pump Station - 1.75 MGD P.S.		1.75	MGD	\$2,625,000	\$525,000	\$3,150,000	\$1,905,283	\$5,055,283	0.0	0.6	62.0%	\$0	\$3,134,275	\$3,134,275	
9. Central Pump Station - 0.75 MG G.S.R.		0.75	MG	\$825,000	\$165,000	\$990,000	\$598,803	\$1,588,803	0.0	0.6	62.0%	\$0	\$985,058	\$985,058	
10. NTMWD Delivery Point No. 2		5.0	MGD	\$1,100,000	\$220,000	\$1,320,000	\$798,404	\$2,118,404	0.0	0.6	62.0%	\$0	\$1,313,411	\$1,313,411	
11. Bois-D'Arcy Lane 8-Inch Pressure Reducing Valve		-----	-----	\$200,000	\$40,000	\$240,000	\$145,164	\$385,164	0.0	0.6	62.0%	\$0	\$238,802	\$238,802	
Proposed Facility Total:				\$4,750,000	\$950,000	\$5,700,000	\$3,447,655	\$9,147,655					\$5,671,546	\$5,671,546	



**2016 - 2026**  
**WATER IMPACT FEE STUDY**

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