



2016 Water and Sewer Impact Fee Update

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City of Saginaw, Texas

September 2016

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Kimley»»Horn



CITY OF SAGINAW, TEXAS



2016

Water and Sewer

Impact Fee

Update

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I. Executive Summary

This document was prepared as an update to the City of Saginaw's current Water and Sewer Impact Fees.

The water distribution system and sanitary sewer collection system infrastructures were analyzed for deficiencies, excess capacity, and the future needs of the City.

Capital improvements for each of the separate systems were formulated and outlined under the appropriate sections. As a result of these studies and the efforts of the Saginaw City Council and staff, the project cost of impact fee eligible system improvements is \$7,207,082. Expenditures to improve current service deficiencies are not assessable as impact fees; only expenditures for water and sewer improvements necessary to provide for future growth are assessable as impact fees. Considering only these expenditures and other recoverable costs, there will be a total of \$1,885,127 recoverable through impact fees over the next ten years. The total project cost and project recoverable cost include the eligible costs of previously constructed projects.

Maximum assessable water and sewer impact fees are listed in **Table 1**. Following the public hearing process, the City Council may implement an amount to be assessed (if any) up to these maximums.

To recover additional CIP expenditures, a city is allowed to reevaluate the system demands and its impact fees whenever necessary; however, the impact fees must be updated at least every five years. For informational purposes, **Table 21** shows comparative impact fees for Saginaw versus other Fort Worth area cities.

**Table 1
Maximum Assessable Impact Fee Summary**

| Size | Maximum Assessable Water Impact Fee (\$) | | | Maximum Assessable Sewer Impact Fee (\$) | | |
|---------------------|--|-----------|------------------|--|---------|------------------|
| | Fort Worth | Saginaw | Total* | Fort Worth | Saginaw | Total* |
| 3/4" displacement | \$704 | \$913 | \$1,617 | \$678 | \$49 | \$727 |
| 1" displacement | \$1,173 | \$1,552 | \$2,725 | \$1,129 | \$83 | \$1,212 |
| 1-1/2" displacement | \$2,345 | \$3,013 | \$5,358 | \$2,258 | \$162 | \$2,420 |
| 2" displacement | \$3,752 | \$4,839 | \$8,591 | \$3,612 | \$260 | \$3,872 |
| 2" compound | \$3,752 | \$4,839 | \$8,591 | \$3,612 | \$260 | \$3,872 |
| 2" turbine | \$3,752 | \$4,839 | \$8,591 | \$3,612 | \$260 | \$3,872 |
| 3" compound | \$10,201 | \$10,682 | \$20,883 | \$9,820 | \$573 | \$10,393 |
| 3" turbine | \$10,201 | \$10,682 | \$20,883 | \$9,820 | \$573 | \$10,393 |
| 4" compound | \$17,588 | \$18,260 | \$35,848 | \$16,932 | \$980 | \$17,912 |
| 4" turbine | \$17,588 | \$19,173 | \$36,761 | \$16,932 | \$1,029 | \$17,961 |
| 6" compound | \$37,520 | \$41,085 | \$78,605 | \$36,120 | \$2,205 | \$38,325 |
| 6" turbine | \$37,520 | \$39,533 | \$77,053 | \$36,120 | \$2,122 | \$38,242 |
| 8" compound | \$65,660 | \$48,663 | \$114,323 | \$63,210 | \$2,612 | \$65,822 |
| 8" turbine | \$65,660 | \$85,183 | \$150,843 | \$63,210 | \$4,572 | \$67,782 |
| 10" turbine | \$98,490 | \$127,820 | \$226,310 | \$94,815 | \$6,860 | \$101,675 |

***Total includes current City of Fort Worth Impact Fees.**

II. Purpose

The Texas Local Government Code, Chapter 395 describes the procedure Texas cities must follow in order to create and implement impact fees. Once impact fees are implemented, the Code requires that cities update them at least every five years. The fees were last updated and adopted by City Council in 2011. The first step required in creating impact fees is the establishment of land use assumptions. Land use assumptions and population projections form the basis for the preparation of impact fee capital improvements plans for water and sewer facilities.

Reasonable future growth projections are necessary in order to aid the City of Saginaw in establishing the need and timing for capital improvements capable of serving future development. Included in this report are the growth and development projections based upon assumptions pertaining to the type, location, quantity and timing of future development within the community.

The purpose of this document is to develop and present the actual maximum impact fees that could be assessed based on the water and sewer system analysis and the capital improvements the City has elected to pursue for each system.

III. Land Use Assumptions

METHODOLOGY

The following components of the methodology for land use assumptions will be detailed in this report: Population, Existing Land Use, Land Use Projections, Ultimate Land Use, and Impact Fee Service Area.

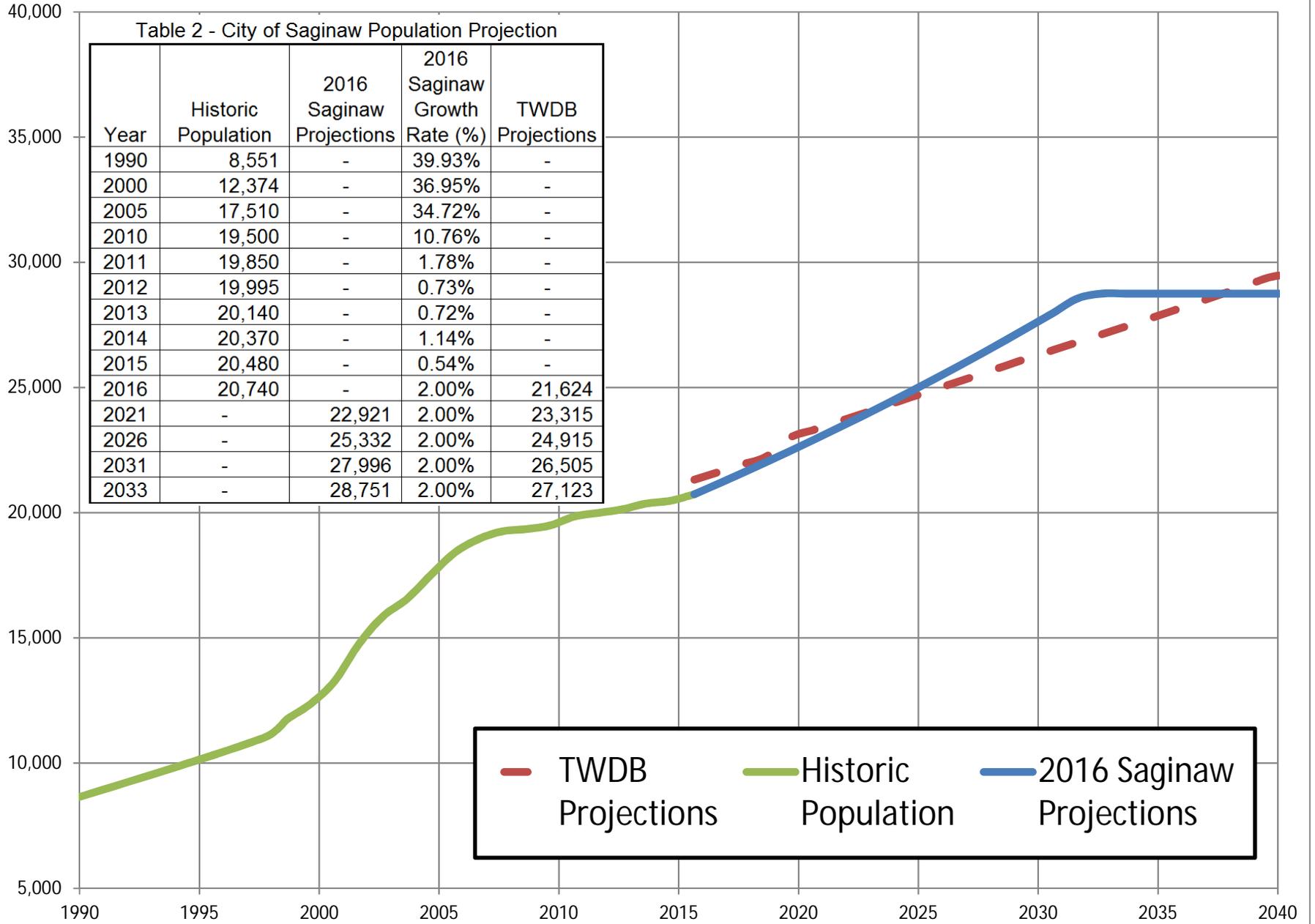
POPULATION

The foundation for this plan is the determination of population and land use forecasts. These forecasts are the basis for the projected water demand, traffic loading, wastewater collection, and drainage needs. However, these forecasts are only projections of current population and employment based on historical growth rates and economic trends in the area. Therefore, these forecasts should be viewed only as approximations of the expected growth of the City of Saginaw.

Table 2 shows City of Saginaw Population Projection. The historic population figures are derived from the North Central Texas Council of Governments (NCTCOG) population and employment forecasts. The 2016 Saginaw projections are based on a population growth rate of 2.0% per year until build out. This population forecast shows that Saginaw will reach its build-out population of 28,751 in approximately 2033. The Texas Water Development Board (TWDB) Projections show a more conservative projection for the growth rate.

Table 2 - City of Saginaw Population Projection

| Year | Historic Population | 2016 Saginaw Projections | 2016 Saginaw Growth Rate (%) | TWDB Projections |
|------|---------------------|--------------------------|------------------------------|------------------|
| 1990 | 8,551 | - | 39.93% | - |
| 2000 | 12,374 | - | 36.95% | - |
| 2005 | 17,510 | - | 34.72% | - |
| 2010 | 19,500 | - | 10.76% | - |
| 2011 | 19,850 | - | 1.78% | - |
| 2012 | 19,995 | - | 0.73% | - |
| 2013 | 20,140 | - | 0.72% | - |
| 2014 | 20,370 | - | 1.14% | - |
| 2015 | 20,480 | - | 0.54% | - |
| 2016 | 20,740 | - | 2.00% | 21,624 |
| 2021 | - | 22,921 | 2.00% | 23,315 |
| 2026 | - | 25,332 | 2.00% | 24,915 |
| 2031 | - | 27,996 | 2.00% | 26,505 |
| 2033 | - | 28,751 | 2.00% | 27,123 |



— TWDB Projections
 — Historic Population
 — 2016 Saginaw Projections

EXISTING LAND USE

Existing land use within the City of Saginaw consists primarily of single-family residential homes in the northwest, southwest, northeast and south parts of the City. A strip of commercial development along the west side of Saginaw Blvd. (US 287) and in the central business district buffers the residential areas from the extensive industrial area bisecting the city. Industrial development is located primarily east of Saginaw Blvd. and the railroad tracks. **Table 3** summarizes the areas of existing land use within the city limits.

**TABLE 3
EXISTING LAND USE**

| Type | Existing Land Use | |
|--------------------------------|-------------------|------------|
| | Acreage | % of total |
| Residential - Single Family | 1,289 | 26.3% |
| Residential - Multi Family | 26 | 0.5% |
| Commercial | 278 | 5.7% |
| Industrial | 895 | 18.2% |
| Community Facility | 227 | 4.6% |
| Planned Development | 67 | 1.4% |
| Railroad and City Right of Way | 852 | 17.3% |
| Parks and Open Space | 182 | 3.7% |
| Agriculture / Vacant | 1,095 | 22.3% |
| Total | 4,911 | |

Table 3 includes areas for each of the major land use types in terms of total acreage and percent of the total area. The existing land use is based on a February, 2016 aerial photograph and recent developments known to the City. Of the 4,911 acres within the City of Saginaw, approximately 3,816 acres, approximately 78%, has been developed. This does not include areas that are currently developed but may be redeveloped at a later date as a different land use. **Exhibit ELU** displays a map of the existing land uses within the City. The existing land uses may differ from the current zoning classifications. Land use represents the current use for the parcel. Zoning represents the allowable uses per the zoning regulations.

ULTIMATE LAND USE

The ultimate land use plan will guide development in the City, however, the ultimate land use plan should be flexible enough to allow the market to determine actual specific uses as long as it maintains compatibility with the adjoining land uses and meets Saginaw's expectation for excellence in design and is consistent with long-term economic viability.

There were several key ideas and planning principles which were used as the foundation for the land use of a development area:

- Neighborhoods – Found near the center of a development area. Neighborhoods, consisting of single-family residences, are the focal point of the development area.
- Higher density dwellings – Consists of duplexes and multi-family complexes near the edges of neighborhoods and the development area.
- Commercial – Typically found along the edges of the development area, near the intersection of arterial streets where there is good access and high visibility for businesses.
 - *Neighborhood Commercial* - May be found within residential areas to provide for establishments such as convenience stores and other low traffic generating businesses.
 - *Office Commercial and Office Park* - Located in such a manner as to serve as a buffer between incompatible uses and yet be accessible to major thoroughfares, residential areas, downtown Fort Worth, and higher density commercial developments and industrial areas.
- Schools and Parks – Located at the center of the development area. The intent is that all residents are only a short distance from a school or park without having to cross a major thoroughfare.
- Industrial – Located within a separate and distinct area from neighborhoods. The use of buffer zones is important to separate industrial land types from neighborhoods. Buffer zones are described in detail on Page 12.

Table 4 indicates the areas projected for each classification for the 2033 (build-out) condition.

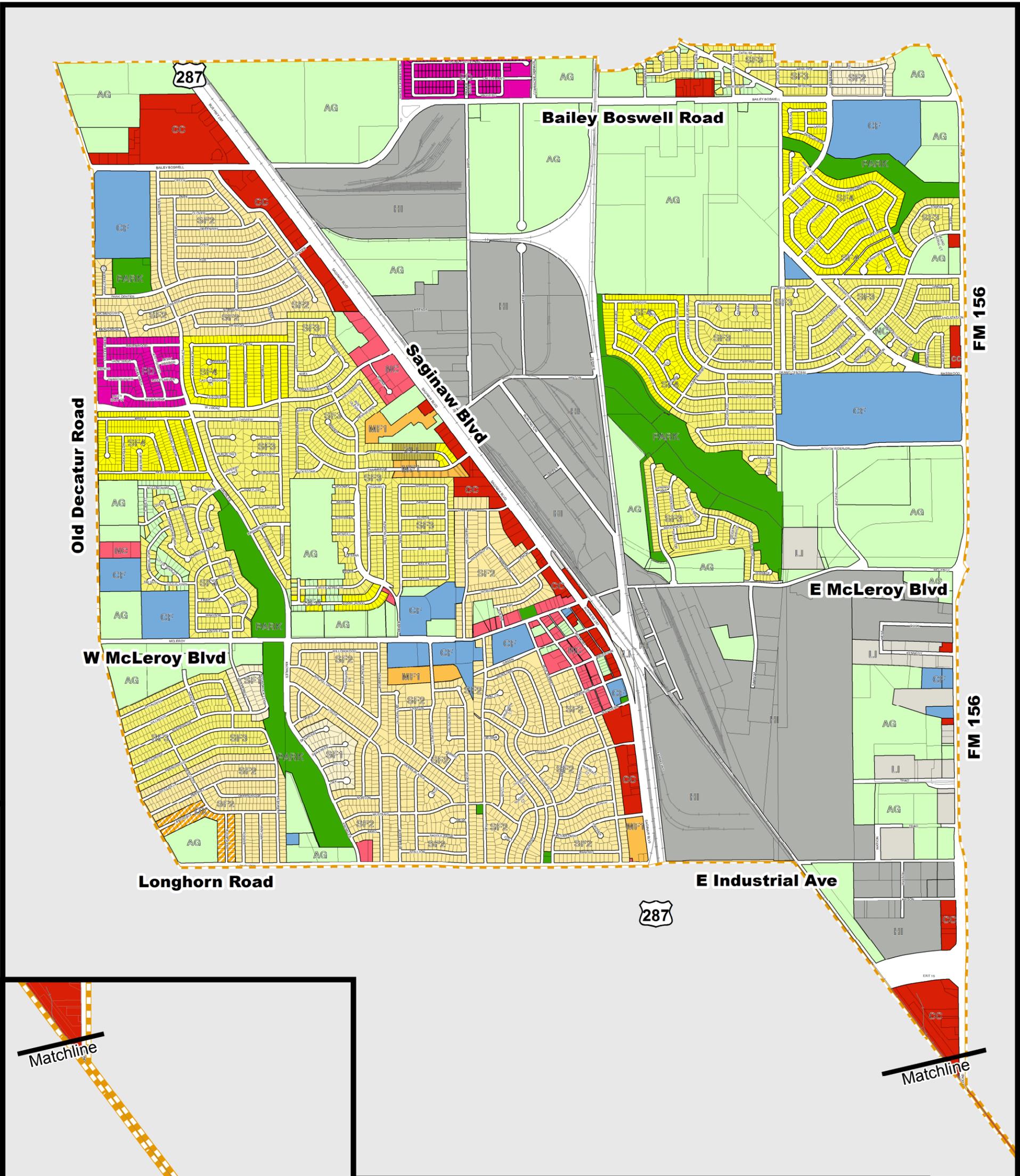
**TABLE 4
ULTIMATE LAND USE**

| Type | Total | |
|--------------------------------|--------------|------------|
| | Acreage | % of total |
| Residential - Single Family | 1,548 | 31.5% |
| Residential - Multi Family | 43 | 0.9% |
| Commercial | 813 | 16.5% |
| Industrial | 1,112 | 22.6% |
| Community Facility | 280 | 5.7% |
| Planned Development | 67 | 1.4% |
| Railroad and City Right of Way | 851 | 17.3% |
| Parks and Open Space | 198 | 4.1% |
| Agriculture / Vacant | - | - |
| Total | 4,911 | |

Table 4 includes areas for each of the major land use types in terms of total acreage and percent of the total area by ultimate land use. **Exhibit ULU** displays a map of the ultimate land uses within the City.

IMPACT FEE SERVICE AREA

Impact fees for the City of Saginaw have been developed for the City's water and sewer service areas. The service area for water and sewer impact fees, includes the entire area within the city limits and bounded predominantly by Old Decatur Road, a line parallel to and just north of Bailey-Boswell Road, Blue Mound Road (FM 156) and Industrial Boulevard/Longhorn Road, as shown on **Figure ELU**.



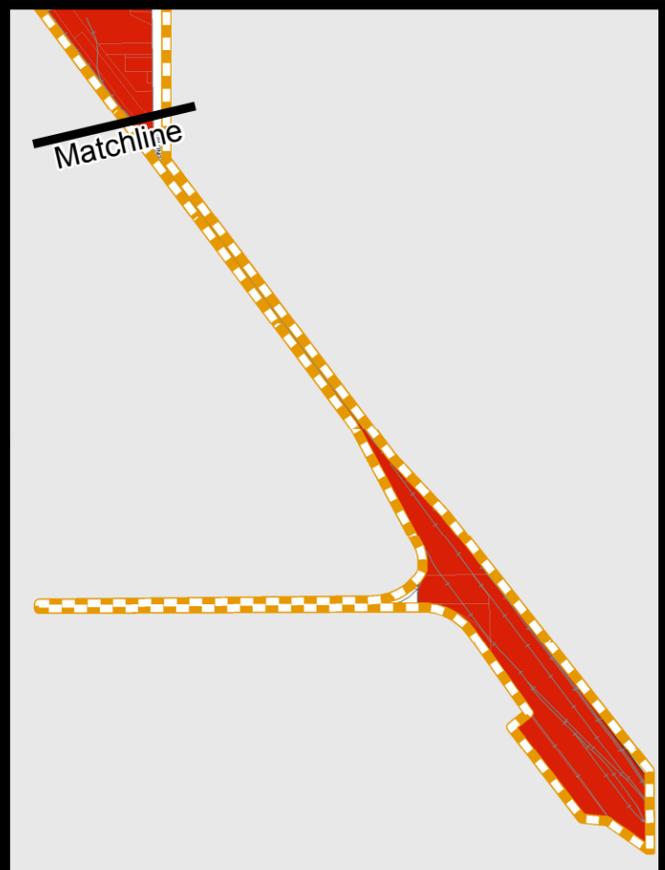
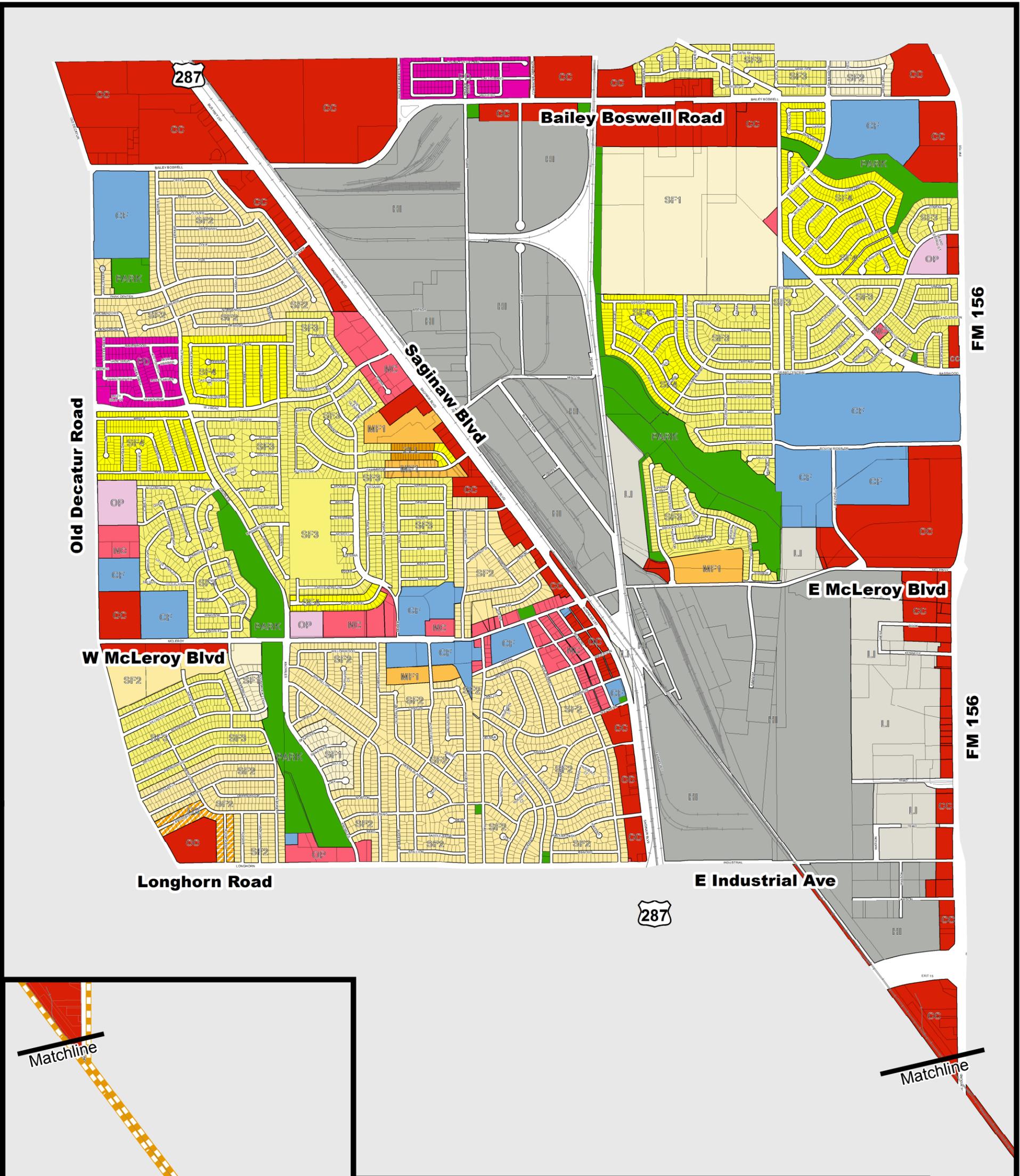
| Legend | | | |
|--------|---|--|------------------------------|
| | SF1 Single Family (9,000 s.f.) | | NC Neighborhood Commercial |
| | SF2 Single Family (7,200 s.f.) | | CC Community Commercial |
| | SF3 Single Family (6,600 s.f.) | | OP Office Professional |
| | SF4 Single Family (5,500 s.f.) | | LI Light Industrial |
| | SFA Single Family Attached | | HI Heavy Industrial |
| | DX Duplex | | CF Community Facility |
| | MH HUD Code Manufactured Housing | | PD Planned Development |
| | ZLL Zero Lot Line | | PARK Parks and Open Space |
| | MF1 Multifamily (18 density units per acre) | | AG Agriculture / Undeveloped |
| | MF2 Multifamily (24 density units per acre) | | |



City of Saginaw, Texas
 2016 Water and Sewer Impact Fee Update
EXISTING LAND USE
 Kimley»Horn
 September 2016

Map Disclaimer

This map product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.



| Legend | |
|--------|---|
| | SF1 Single Family (9,000 s.f.) |
| | SF2 Single Family (7,200 s.f.) |
| | SF3 Single Family (6,600 s.f.) |
| | SF4 Single Family (5,500 s.f.) |
| | SFA Single Family Attached |
| | DX Duplex |
| | MH HUD Code Manufactured Housing |
| | ZLL Zero Lot Line |
| | MF1 Multifamily (18 density units per acre) |
| | MF2 Multifamily (24 density units per acre) |
| | NC Neighborhood Commercial |
| | CC Community Commercial |
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| | LI Light Industrial |
| | HI Heavy Industrial |
| | CF Community Facility |
| | PD Planned Development |
| | PARK Parks and Open Space |
| | AG Agriculture / Undeveloped |

City of Saginaw

City of Saginaw, Texas
2016 Water and Sewer Impact Fee Update

ULTIMATE LAND USE PLAN

Kimley»Horn

September 2016

Map Disclaimer

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IV. Water Impact Fees

The City of Saginaw has focused on completing the major water system infrastructure improvements called for in previous plans and has a reliable system close to ultimate capacity.

Exhibit EW shows the existing water distribution system map. Water Systems are generally comprised of the following components:

DEFINITIONS

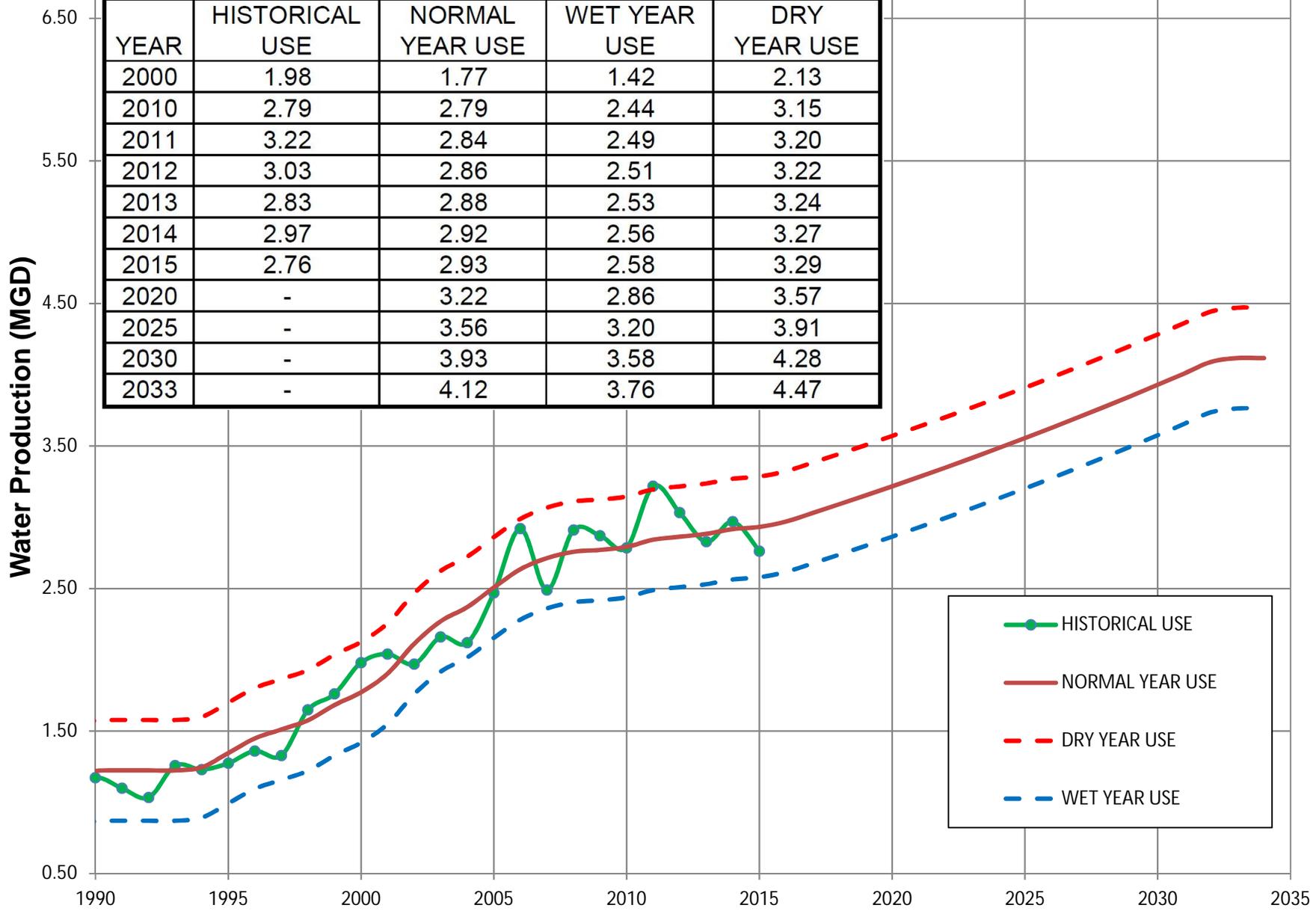
- **Water Supply** can either be from a surface water source or a ground water source. Saginaw is 100% dependent upon the City of Fort Worth for wholesale water supply, which is surface water.
- **Water Treatment** is the treatment of raw water so it is fit for human consumption. The City of Fort Worth provides treated water to the City of Saginaw.
- **High Service Pumping** is the pumping required to move the water from a treatment facility or ground storage to the transmission and distribution systems.
- **Booster Pumps** increase the pressure from a stored source or from another water line.
- **Transmission System** is comprised of large water lines which transport large quantities of water from one area to another.
- **Distribution System** is comprised of smaller water lines which distribute water from the transmission system to the customers.
- **Service Lines** are the small, privately owned, water lines which connect each individual customer to the distribution system.
- **Elevated Storage** are tanks that are raised above the ground and connected to the transmission system to help maintain the system pressure. Excess water pumped flows into these tanks, or if pumping does not meet customer demand, water drains from the tanks to supplement the pumping.
- **Ground Storage** are tanks at ground level that store water so that it can be pumped into the system as demand warrants.
- **Average Day Demand (ADD)** Annual water consumption divided by the number of days in a year. The average daily water demand a given water system experiences over a one-day period.

- **Demand (Consumption)** Volume of water used for a given time period, typically measured in units of Million Gallons Per Day (MGD) or gallons per minute (gpm).
- **Firm Pumping Capacity** The total pumping capacity that a pump station can deliver with the largest pump out of service. The state requires that water systems have firm capacity that meets peak day requirements.
- **GPD** Gallons Per Day
- **GPM** Gallons Per Minute
- **MGD** Million Gallons per Day
- **Peak Day Demand (PDD)** Water consumption, in volume of water, used on the highest consumption day in a year. Also known as maximum day demand.
- **Peak Hour Demand (PHD)** The maximum total one-hour water demand given in units of volume per day that a given distribution system experienced or would experience during a particular year or other time period. Also known as maximum hour demand.
- **Pressure Plane (Pressure Zone)** A network of water pipes having a common pressure range; each plane is separated from the other planes by closed valves, pressure-regulating valves, pump stations, and storage facilities. The City of Saginaw’s water system is on one pressure plane.
- **Service Unit** 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 principles for a particular category of capital improvements or facility expansions.
- **TCEQ** Texas Commission on Environmental Quality
- **Total Pumping Capacity** The total pumping capacity that a pump station can deliver.

WATER DEMAND

In previous years there have been two main factors that affect water use in the City of Saginaw: population and the amount of precipitation. The potential for high volume industrial users has changed this factor. Population can be estimated from year to year and generally increases within a predictable range. Rainfall can vary greatly from year to year and it is impossible to predict how much rainfall will occur in a given year. Water projections are produced with a range of likely demands based on population, industrial and commercial demand, and set rainfall amounts. Projections are divided into normal, wet, and dry ranges for a given year. **Table 5** shows historical and projected average day demand.

| YEAR | HISTORICAL USE | NORMAL YEAR USE | WET YEAR USE | DRY YEAR USE |
|------|----------------|-----------------|--------------|--------------|
| 2000 | 1.98 | 1.77 | 1.42 | 2.13 |
| 2010 | 2.79 | 2.79 | 2.44 | 3.15 |
| 2011 | 3.22 | 2.84 | 2.49 | 3.20 |
| 2012 | 3.03 | 2.86 | 2.51 | 3.22 |
| 2013 | 2.83 | 2.88 | 2.53 | 3.24 |
| 2014 | 2.97 | 2.92 | 2.56 | 3.27 |
| 2015 | 2.76 | 2.93 | 2.58 | 3.29 |
| 2020 | - | 3.22 | 2.86 | 3.57 |
| 2025 | - | 3.56 | 3.20 | 3.91 |
| 2030 | - | 3.93 | 3.58 | 4.28 |
| 2033 | - | 4.12 | 3.76 | 4.47 |



METHODOLOGY

Water System Modeling Methodology

To evaluate the water system for the first impact fees in 1995, a computer model was formulated representing the pressure plane. The hydraulic analysis relies on a computer program (WaterCAD™) that solves a large set of simultaneous non-linear equations representing hydraulic and geometric characteristics of the pipe network. Information required includes pipe data, node data (connection point of two or more pipes or a demand point), storage data, and pump data. Pipe data was extracted from City water maps, construction plans, and interviews with City staff members. Pipe data consists primarily of pipe length, location, diameter, and the roughness coefficient of the pipe. Node data consists of ground elevation and demand, with elevations determined from City of Saginaw topographic maps and flow demands from monthly meter records. Pump data was supplied by the City, verified in the field, and modeled by each pump's characteristic performance curve. Storage data was modeled by each facility's water surface elevation and diameter.

To verify the capability of the computer model to reasonably represent actual system conditions, the model was based on a calibrated system. Initial model creation and calibration was accomplished in June 1996 for the 1997 Impact Fee Update. It was updated in 2000, 2005, 2011 and again in 2016 for this impact fee update.

To evaluate the performance of the network, several computational runs were made with varied combinations of demand levels, pump combinations, water levels in the tanks, pipe diameters, adding and removing pipes, etc. A thorough knowledge of the existing system, design and performance criteria, future performance objectives, and hydraulic principles allowed the choice of a limited number of configurations for computational analysis.

For this update, storage, supply, and pumping requirements were first checked for minimum capacity requirements. Storage capacities for both ground and elevated storage were checked against minimum criteria as set forth in the "Design Criteria" section below. Supply source capacity and fire pumping capacity were checked against projected maximum day demands.

The determination of need for additional network piping was made by computer analysis of peak day, fire flow, and peak hour conditions. By applying basic hydraulic principles, pipes were located within the

network to establish desirable operating characteristics within the system. Alignments of proposed water transmission improvements are coordinated with the City of Saginaw's Master Thoroughfare Plan. After adding any required improvements to the model, replenishment capabilities were checked for both ground and elevated storage tanks. With high service pumping capable of delivering the maximum day demand, the system must be able to replenish elevated storage during periods of low usage. Using the model, the added pipes, storage, and pumps were checked to verify that they could maintain suitable pressure and volume requirements for the maximum day demand condition. If necessary criteria were not met, the system was repeatedly adjusted and re-analyzed until satisfactory results were obtained.

DESIGN CRITERIA

Chapter 290 of the Texas Administrative Code, "Public Drinking Water," mandates the minimum requirements for water systems operating in the State of Texas. The minimum requirements are as follows:

- **Pressure:**

- Peak hour demand with a minimum pressure of 35 psi
- Night-time tank filling with a maximum pressure of 100 psi
- Peak day demand plus fire flow with a minimum pressure of 20 psi

- **Pumping:**

Each pump station or pressure plane must have two or more pumps that have a total capacity of 2.0 gallons per minute per connection, or have a total capacity of at least 1,000 gallons per minute and the ability to meet peak hour demand with the largest pump out of service, whichever is less. If the system provides elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gpm per connection are required.

These criteria are used to evaluate the existing and proposed physical components of the water system.

The components of the water system that have been evaluated are:

- Water Supply
- Pumping Capacity
- Storage
- Transmission and Distribution System

WATER SUPPLY

The City of Fort Worth delivers treated water to Saginaw at a single delivery point, Longhorn Pump Station. The Longhorn facility stores the water in two (2) one million gallon ground storage tanks which is then pumped into the Saginaw system. Saginaw takes the water as needed and pays the City of Fort Worth by volume and demand fees. Demand fees are applied if water is supplied during peak periods. There are two emergency interconnects (at Twin Mills and Highland Station) to the City of Fort Worth's system. If an emergency occurs, Saginaw can lose its pumping and/or storage capabilities and still be supplied via the emergency interconnects. The existing Fort Worth Longhorn meter station has a capacity of 5,500 gpm. Based on current flow projections, the station will need to be upsized to 8,500 gpm to meet build out conditions.

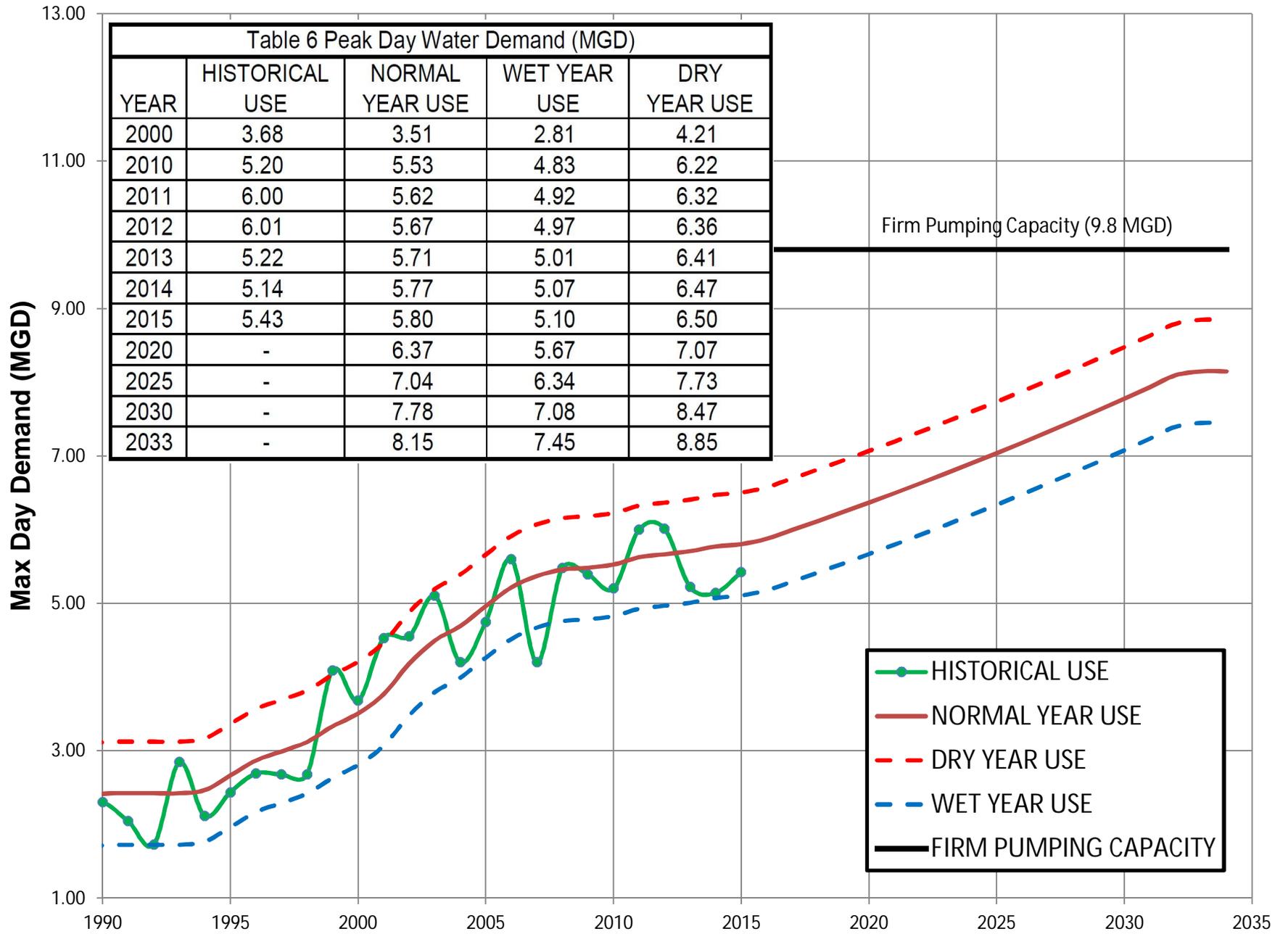
PUMPING CAPACITY

Pumping capacities must provide the maximum demand or the peak hour demand required by the water system or the suggested capacities established by the TCEQ. Pumping capacity should supply the maximum demand with sufficient redundancy to allow for the largest pump at the pump station to be out of service. This is known as firm pumping capacity.

In 2008, the station was upgraded to a peak and firm capacity of 15.6 MGD and 9.8 MGD, respectively. The Jarvis Road 1.5 million gallon elevated storage tank was constructed in 2006. The Jarvis Road elevated storage tank and Parkside elevated storage tank provide sufficient elevated storage to qualify for a pumping requirement reduction. TCEQ requires 0.6 gpm per connection for this scenario. The City meets the specified TCEQ pumping requirement for ultimate conditions.

Table 6 shows the historical and projected maximum day demands.

| YEAR | HISTORICAL USE | NORMAL YEAR USE | WET YEAR USE | DRY YEAR USE |
|------|----------------|-----------------|--------------|--------------|
| 2000 | 3.68 | 3.51 | 2.81 | 4.21 |
| 2010 | 5.20 | 5.53 | 4.83 | 6.22 |
| 2011 | 6.00 | 5.62 | 4.92 | 6.32 |
| 2012 | 6.01 | 5.67 | 4.97 | 6.36 |
| 2013 | 5.22 | 5.71 | 5.01 | 6.41 |
| 2014 | 5.14 | 5.77 | 5.07 | 6.47 |
| 2015 | 5.43 | 5.80 | 5.10 | 6.50 |
| 2020 | - | 6.37 | 5.67 | 7.07 |
| 2025 | - | 7.04 | 6.34 | 7.73 |
| 2030 | - | 7.78 | 7.08 | 8.47 |
| 2033 | - | 8.15 | 7.45 | 8.85 |



STORAGE

The TCEQ and the State Board of Insurance (SBI) have established criteria for ground and elevated storage. These criteria address volume and height requirements only. The layout of the distribution system, location of the storage facilities, and the interaction with the high service and booster pumps affect the amount of storage necessary for the most efficient and reliable operation of the system.

GROUND STORAGE

Ground storage serves two functions:

- Equalization for differing feed rates between the water supply and pumping to the system.
- Emergency capacity in the event of temporary loss of water supply.

Generally, ground storage facilities are located at water supply points or at each pump station within the water distribution system. Suggested storage capacities are established based on several criteria. There are specific requirements for TCEQ. These criteria are detailed later in this section. Although ground and elevated storage facilities perform separate functions within the system, both are aimed at decreasing the impact of demand fluctuations. Their capacities are established based on knowledge of how demand varies seasonally and daily.

ELEVATED STORAGE

Elevated storage serves three purposes:

- Functionally, elevated storage equalizes the pumping rate to compensate for daily variations in demand and to maintain a fairly constant pumping rate (usually referred to as operational storage), or a pumping rate that conforms to the requirements of the electrical rate structure.
- Provides pressure maintenance and protection against surges created by instantaneous demand, such as fire flow and main breaks, and instantaneous change in supply, such as pumps turning on and off.
- Maintains a reserve capacity for fire protection and pressure maintenance in case of power failure to one or more pump stations. Sufficient storage should be maintained to provide four hours of fire flow demand during a loss of power to the pump station.

A backup generator is present at the pump station, increasing system reliability and reducing storage dedicated for fire protection.

Suggested storage capacities are established by the TCEQ. Adequate operational storage is established by determining the required volume to equalize the daily fluctuations in flow during the maximum day demand, plus the reserve volume required for fire protection. The minimum requirements for storage, according to Chapter 290 of the Texas Administrative Code, are as follows:

- **Total Storage Requirement** - Equal to 200 gallons per connection.
- **Elevated Storage Requirement** - Equal to 100 gallons per connection.
- **Elevated Storage Requirement for Pumping Capacity Requirement Reduction**– Equal to 200 gallons per connection for a firm pumping capacity requirement reduction from 2.0 gallons per connection to 0.6 gallons per connection.

TRANSMISSION AND DISTRIBUTION SYSTEM

The transmission system should be sized to maintain a minimum pressure of 45 psi during normal operating conditions and a minimum pressure of 20 psi during extreme operating conditions. In a current urban-type water system, operating pressures of 35 psi normally result in customer complaints. In addition, pressures above 80 psi are undesirable and should be avoided. The maximum pressure in extreme conditions should be limited to 120 psi because high operating pressure will result in increased system maintenance and increased operational cost. The transmission system should also be sized to limit maximum velocity in the transmission system to seven feet per second.

WATER IMPACT FEE CAPITAL IMPROVEMENTS PLAN

Table 7 lists all the projects from the source plans and indicates which projects are eligible for inclusion in this 2016 water impact fee capital improvements plan. The projects were previously identified in the following source plans:

- the 2011 Comprehensive Master Plan and CIP (2011 CMP).
- the 2016 Comprehensive Master Plan and CIP (2016 CMP).

**Table 7
Water Capital Improvements Projects**

| Project | Project Number in 2011 MP | Project Number in 2016 MP | Status | Eligible for Impact Fees |
|------------------------------------|---------------------------|---------------------------|--|--------------------------|
| S. Hampshire 16" Water Line | 3 | 1 | Planned for construction in 2017-2018 | Yes |
| CDBG Bluebonnet St. 6" Water Line | - | 2 | Planned for construction in 2016-2017 | No Rehabilitation |
| Saginaw Blvd 12" Water Line Ph. 2 | 5 | 3 | Planned for construction in 2017-2018 | Yes |
| Saginaw Blvd. 16" Water Line Ph. 2 | 6 | 4 | Planned for construction in 2019-2020 | Yes |
| W. McLeroy 12" Water Line Ph. 2 | 8 | 5 | Planned for construction in 2020-2021 | Yes |
| FM 156 12" Water Line | - | - | Planned for completion Fall, 2016 | Yes |
| Old Decatur 8" Water Line | 11 | 6 | Expected to be constructed by developers | No |
| Old Decatur 12" Water Line Ph. 1 | 12 | 7 | Expected to be constructed by developers | No |
| Fort Worth Meter Station Upgrade | 7 | 8 | Expected to be constructed by City of Fort Worth | No |
| E. McLeroy Blvd. 12" Water Line | 9 | 9 | Expected to be constructed by developers | No |

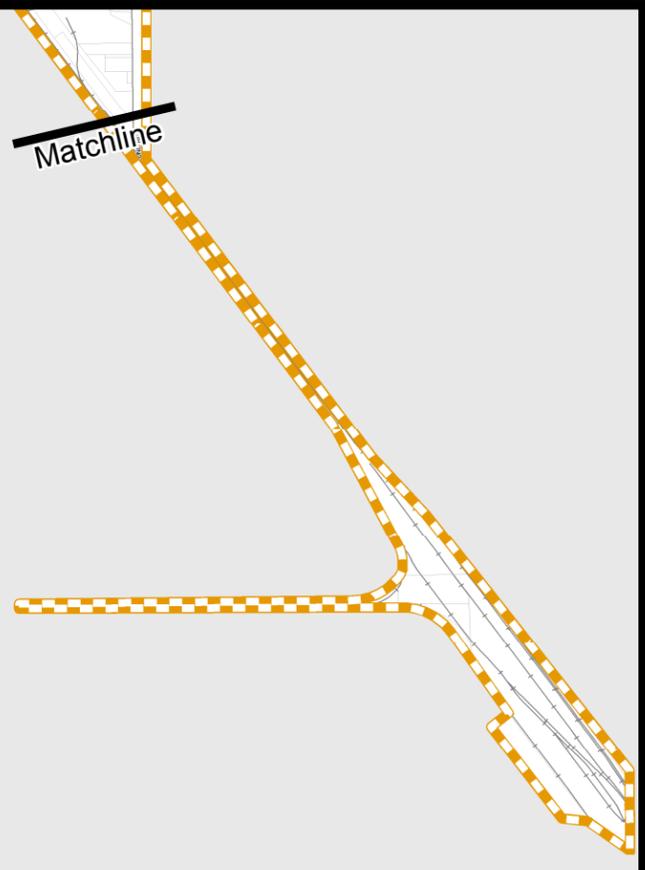
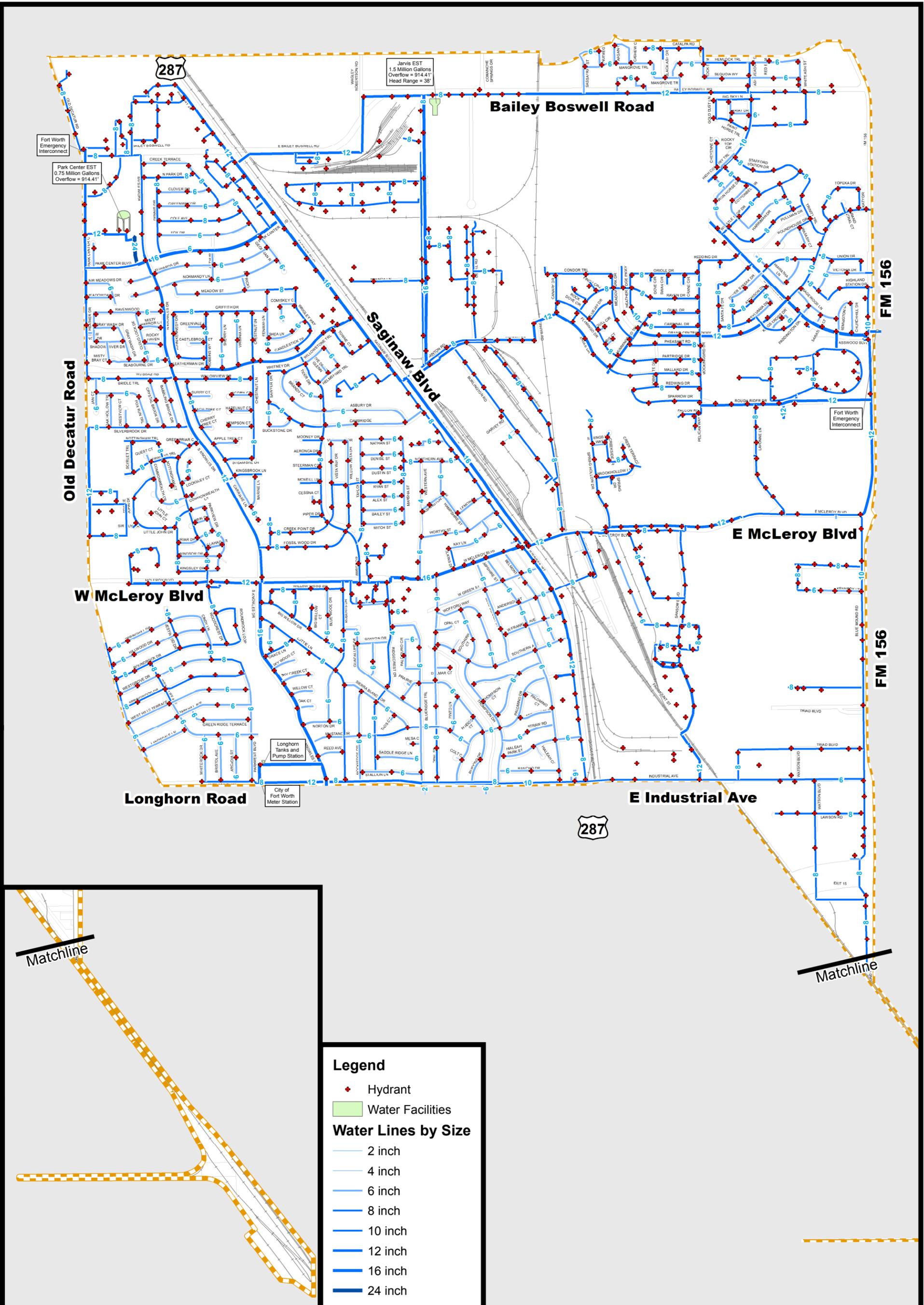
| Project | Project Number in 2011 MP | Project Number in 2016 MP | Status | Eligible for Impact Fees |
|---|----------------------------------|----------------------------------|---|---------------------------------|
| Basswood Blvd. 12" Water Line | 10 | 10 | Expected to be constructed by developers | No |
| Heather Ridge Pkwy. 12" Water Line | - | 11 | Expected to be constructed by developers | No |
| F.M. 156 12" Water Line Ph.2 | 14 | 12 | Expected to be constructed by developers | No |
| Condor Trl. 12" Water Line | - | 13 | Expected to be constructed by developers | No |
| Defiel Rd. 8" Water Line | - | 14 | Expected to be constructed by developers | No |
| Bailey Boswell Rd. 12" Water Line Loop | - | 15 | Expected to be constructed by developers | No |
| Longhorn Rd. & Old Decatur 8" Water Line Connection | - | 16 | Expected to be constructed by developers. | No |
| Water and Wastewater Rate Study | 1 | - | Complete | No |
| Longhorn PS Motor #5 Replacement Project | 2 | - | Complete | No |
| Saginaw Blvd 12" Water Line Ph. 1 | 4 | - | Complete | Yes |
| Old Decatur 12" Water Line Ph. 2 | 13 | - | Completed by developers | No |

Capital Improvements

The projected cost of impact fee eligible system improvements is \$6,331,189, with \$3,506,247 being recoverable through impact fees serving the 10-year system needs. The total recoverable cost includes the eligible recoverable cost of previously constructed projects. These capital improvements projects are shown in **Table 8**. Further information about each of these projects is outlined in the City of Saginaw 2016 Master Plan and CIP.

Table 8
City of Saginaw Water Impact Fee Capital Improvements
Project Cost and 10-year Recoverable Cost

| Description | 2016 Required Capacity | 2026 Required Capacity | Build Out Required Capacity | Total Project Cost | 2026 Required Capacity (Percent Utilization) | 2026 Projected Recoverable Cost |
|--|------------------------------|------------------------------|-----------------------------------|--------------------------|--|--|
| <i>Future Projects</i> | | | | | | |
| S. Hampshire 16" Water Line | 8" | 16" | 16" | \$721,000 | 75% | \$540,750 |
| Saginaw Blvd. 12" Water Line Ph.2 | 8" | 12" | 12" | \$370,000 | 56% | \$207,200 |
| Saginaw Blvd. 16" Water Line Ph.2 | 0" | 16" | 16" | \$1,190,000 | 100% | \$1,190,000 |
| W. McLeroy 12" Water Line Ph. 2 | 0" | 12" | 12" | \$260,000 | 100% | \$260,000 |
| FM 156 12" Water Line | 0" | 12" | 12" | \$195,636 | 100% | \$195,636 |
| Subtotal | | | | \$2,736,636 | | \$2,393,586 |
| <i>Previously Constructed Projects</i> | | | | | | |
| 2016 Water Master Plan | - | - | - | \$15,000 | 100% | \$15,000 |
| 2016 Water Impact Fee Update | - | - | - | \$6,000 | 100% | \$6,000 |
| Saginaw Blvd. 12" Water Line Ph.1 | 10" | 12" | 12" | \$529,614 | 31% | \$164,180 |
| Jarvis Rd. 1.5 MG Elevated Storage Tank | 0.65 MG | 1.06 MG | 1.50 MG | \$2,421,600 | 27% | \$653,832 |
| Jarvis Rd. 16" Water Line (and 12" Water Line on Bailey Boswell) | 12" | 16" | 16" | \$622,339 | 44% | \$273,829 |
| Subtotal | | | | \$3,594,553 | | \$1,112,841 |
| Total | | | | \$6,331,189 | | \$3,506,247 |



Legend

- ◆ Hydrant
- Water Facilities

Water Lines by Size

- 2 inch
- 4 inch
- 6 inch
- 8 inch
- 10 inch
- 12 inch
- 16 inch
- 24 inch

EW

City of Saginaw

City of Saginaw, Texas
2016 Water and Sewer Impact Fee Update

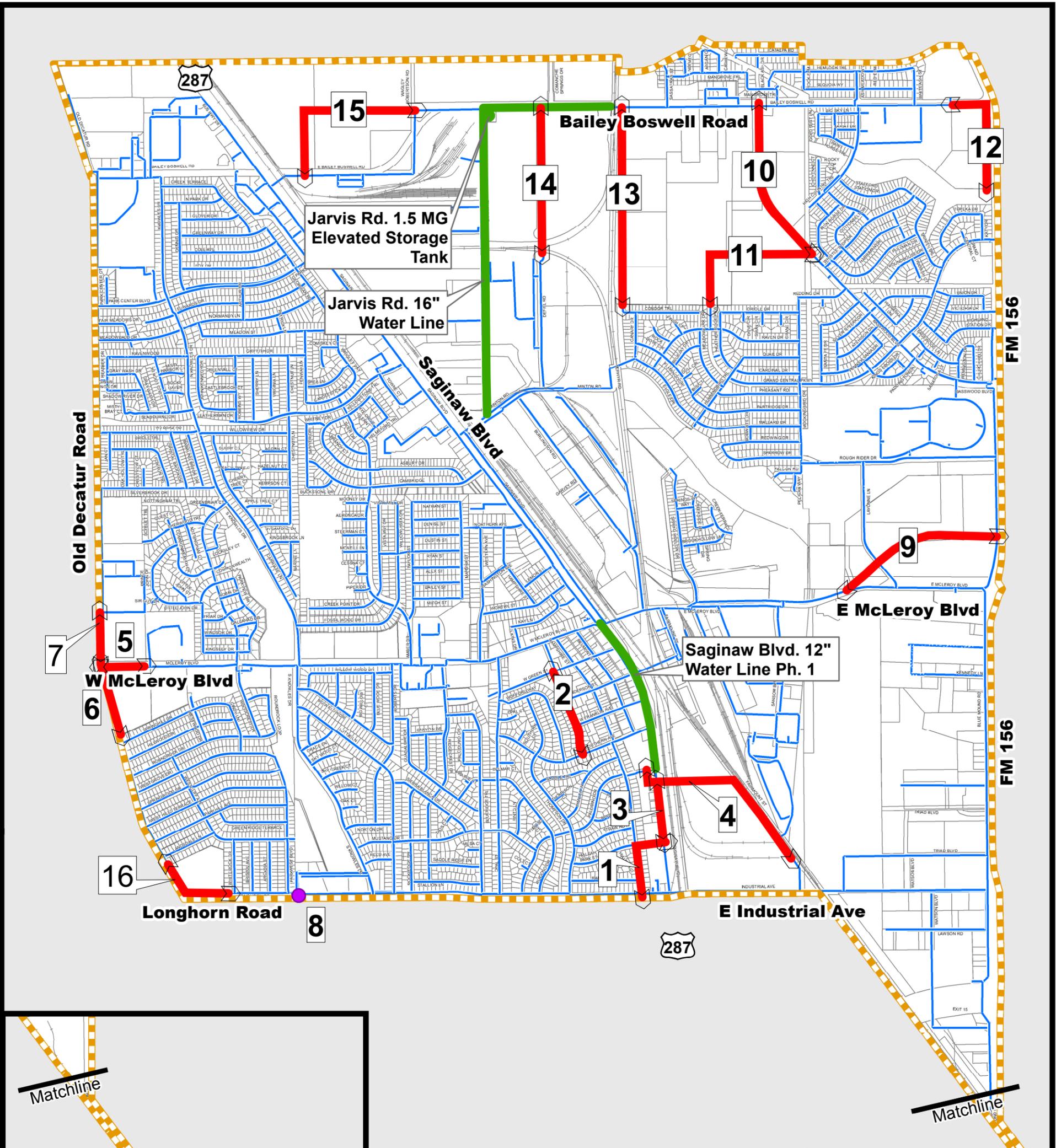
EXISTING WATER SYSTEM

Kimley»Horn

September 2016

Map Disclaimer

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- 2016-2021 Water CIP**
- 1) S. Hampshire 16" Water Line
 - 2) CDBG Bluebonnet Street 6" Water Line
 - 3) Saginaw Blvd. 12" Water Line Ph. 2
 - 4) Saginaw Blvd. 16" Water Line Ph. 2
 - 5) W. McLeroy 12" Water Line Ph. 2
 - 6) Old Decatur 8" Water Line
 - 7) Old Decatur 12" Water Line Ph. 1
 - 8) Fort Worth Meter Station Upgrade
 - 9) East McLeroy Blvd. 12" Water Line
 - 10) Basswood Blvd. 12" Water Line
 - 11) Heather Ridge Pkwy. 12" Water Line
 - 12) FM 156 12" Water Line Ph. 2
 - 13) Condor Trail 12" Water Line
 - 14) Defiel Rd. 8" Water Line
 - 15) Bailey Boswell Rd. 12" Water Line Loop
 - 16) Longhorn Rd. & Old Decatur 8" Water Line Connection



City of Saginaw, Texas
 2016 Water and Sewer Impact Fee Update
WATER CIP
 Kimley»Horn
 September 2016

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WATER IMPACT FEE CALCULATION

Chapter 395 of the Local Government Code defines a service unit as follows, “”Service Unit” means a standardized measure of consumption attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards and based on historical data and trends applicable to the political subdivision in which the individual unit of development is located during the previous 10 years.” Therefore, the City of Saginaw defines a service unit based on historical water usage over the past 10 years as compared to the estimated residential units. The residential unit is the development type that predominately uses a 3/4” meter. The measure of consumption per service unit is based on a 3/4” meter and the data shown in **Table 9**.

Table 9
Service Unit Consumption Calculation

| Year | Population | Residential Units (3.14 persons/unit) | Water Usage Average Day Demand (MGD) | Consumption per Service Unit (GPD) |
|---|-------------------|--|---|---|
| 2006 | 18,404 | 5,861 | 2.49 | 425 |
| 2007 | 18,950 | 6,035 | 2.49 | 413 |
| 2008 | 19,260 | 6,134 | 2.91 | 474 |
| 2009 | 19,350 | 6,162 | 2.87 | 466 |
| 2010 | 19,500 | 6,210 | 2.79 | 449 |
| 2011 | 19,850 | 6,322 | 3.22 | 509 |
| 2012 | 19,995 | 6,368 | 3.03 | 476 |
| 2013 | 20,140 | 6,414 | 2.83 | 441 |
| 2014 | 20,370 | 6,487 | 2.97 | 458 |
| 2015 | 20,480 | 6,522 | 2.76 | 423 |
| Average Consumption per Service Unit | | | | 453 |

Additional Service Units and Water Impact Fee Calculation

Based on the City’s 10-year growth projections and the resulting water demand projections, water service will be required for an additional 1,920 service units. The calculation is as follows:

A service unit, which is a unit of development that consumes approximately 453 gallons per day (GPD), is a typical residential connection that uses a 3/4” meter. **Table 10** outlines the future water demand projections and its relationship to the additional service units projected for the next 10-years.

Table 10
10-year Additional Service Units Calculation

| Year | Average Day Demand (MGD) | Service Unit Demand (GPD) | Service Units |
|---|---------------------------------|----------------------------------|----------------------|
| 2016 | 2.75 | 453 | 6,071 |
| 2026 | 3.62 | 453 | 7,991 |
| 10-year Additional Service Units | | | 1,920 |

Impact fee law allows for a credit calculation to credit back the development community based on the utility revenues or ad valorem taxes that are allocated for paying a portion of future capital improvements. The intent of this credit is to prevent the City from double charging development for future capital improvements via impact fees and utility rates. If the city chooses not to do a financial analysis to determine the credit value they are required by law to reduce the recoverable cost by 50 percent. The city has chosen the latter. Therefore, the maximum recoverable cost for impact fee shown below is 50 percent of the Pre Credit Recoverable Cost.

Table 11 lists a breakdown of the 10-year recoverable costs and the associated impact fee per service unit.

Table 11
10-year Recoverable Cost Breakdown

| | |
|--|--------------------|
| Recoverable Impact Fee CIP Costs | \$3,506,427 |
| Credit for Utility Revenues (50% credit) | \$1,753,214 |
| Maximum Recoverable Cost for Impact Fee | \$1,753,214 |

$$\text{Impact fee per service unit} = \frac{\text{10-year recoverable costs}}{\text{10-year additional service units}}$$

$$\text{Impact fee per service unit} = \frac{\$1,753,214}{1,920}$$

$$\text{Impact fee per service unit} = \underline{\$913}$$

Therefore, the maximum assessable impact fee per service unit is \$913.

For a development that requires a different size meter, a service unit equivalent is established at a multiplier based on its capacity with respect to the 3/4" meter. The maximum impact fee that could be assessed for other meter sizes is based on the value shown on **Table 12**, Service Unit Equivalency Table for Commonly Used Meters.

Table 12
Maximum Water Impact Fee for
Commonly Used Meters

| Meter Size/Type | Service Unit Equivalent | Maximum Assessable Impact Fee (\$) |
|------------------------|--------------------------------|---|
| 3/4" displacement | 1.0 | \$913 |
| 1" displacement | 1.7 | \$1,552 |
| 1-1/2" displacement | 3.3 | \$3,013 |
| 2" displacement | 5.3 | \$4,839 |
| 2" compound | 5.3 | \$4,839 |
| 2" turbine | 5.3 | \$4,839 |
| 3" compound | 11.7 | \$10,682 |
| 3" turbine | 11.7 | \$10,682 |
| 4" compound | 20.0 | \$18,260 |
| 4" turbine | 21.0 | \$19,173 |
| 6" compound | 45.0 | \$41,085 |
| 6" turbine | 43.3 | \$39,533 |
| 8" compound | 53.3 | \$48,663 |
| 8" turbine | 93.3 | \$85,183 |
| 10" turbine | 140.0 | \$127,820 |

V. Sewer Impact Fees

The existing sanitary sewer collection system consists entirely of gravity flow lines. There are currently no lift stations operated by the City of Saginaw. Saginaw owns no treatment facilities and relies solely on the City of Fort Worth to accept all of Saginaw's wastewater flows through four wastewater meter stations. The East Meter Station is east of FM 156 at Little Fossil Creek, the Southwest Meter Station is south of Longhorn Road at West Cement Creek, the Southeast Meter Station is located south of Longhorn Road at East Cement Creek, and the North Meter Station is located west of FM 156 at Big Fossil Creek. **Exhibit EWW** shows the existing wastewater collection system.

DEFINITIONS

- **Base flow**
The total amount of wastewater discharged by the customer.
- **Infiltration**
The water entering the collection system and private service lines from the ground, through defective pipe joints, broken pipes, cracks in manhole walls, and bad pipe-to-pipe and pipe-to-manhole connections.
- **Inflow**
The water entering the collection system and service lines from direct surface connections such as roof drains, yard drains, holes in manhole covers, etc.
- **Interceptor**
Large diameter sanitary sewer line utilized for wastewater transmission.
- **GPD**
Wastewater flow measurement in Gallons Per Day.
- **GPM**
Wastewater flow measurement in Gallons Per Minute.
- **MGD**
Wastewater flow measurement in Million Gallons per Day.

METHODOLOGY AND DESIGN CRITERIA

Acceptable land use assumptions, planning and zoning criteria and historical population data were utilized to calculate population for existing conditions (year 2016), year 2026 and ultimate build-out for the City of Saginaw. Based on the anticipated population numbers, flows can be calculated for sewer collection and conveyance. The following methodology was used to determine sewer flows.

Sewage Flow Projections

Both average and peak flow rates are calculated based on the City's existing and anticipated population. An additional component of flow known as inflow and infiltration (I/I) is also included in the peak flow calculation in order to determine the maximum capacity of the system. Saginaw's sewer system was evaluated by utilizing calculations for two (2) separate components: Average Daily Flow and Peak Flow.

Average Daily Flow was calculated by applying a flow rate based on the flow rates in **Table 13**.

Table 13
Flow Rates by Land Use

| Land Use Category | Gal/Acre/Day |
|--------------------------|---------------------|
| <i>SF1</i> | 835 |
| <i>SF2</i> | 845 |
| <i>SF3</i> | 855 |
| <i>SF4</i> | 895 |
| <i>DX</i> | 890 |
| <i>ZLL</i> | 890 |
| <i>MF1</i> | 2,500 |
| <i>MF2</i> | 2,500 |
| <i>OP</i> | 500 |
| <i>NC</i> | 900 |
| <i>CC</i> | 900 |
| <i>CF</i> | 500 |
| <i>PARK</i> | 0 |
| <i>LI</i> | 550 |
| <i>HI</i> | 550 |
| <i>PD</i> | 890 |

Peak Flow was calculated by multiplying the Average Daily Flow for a given area by a factor of 5.2. Peak flows are used to size the sewer collection system.

Inflow/Infiltration is typically the result of deteriorating or damaged system components and/or the utilization of poor construction materials and installation methodology. Cracked, crushed and eroded sewer line, poorly fitted pipes joints, and improperly attached or aging house connections can all result in groundwater inflow and infiltration. Similarly, deteriorating manholes, manholes with broken ring covers, manholes without covers, and improper storm water connections are also contributing factors to I/I.

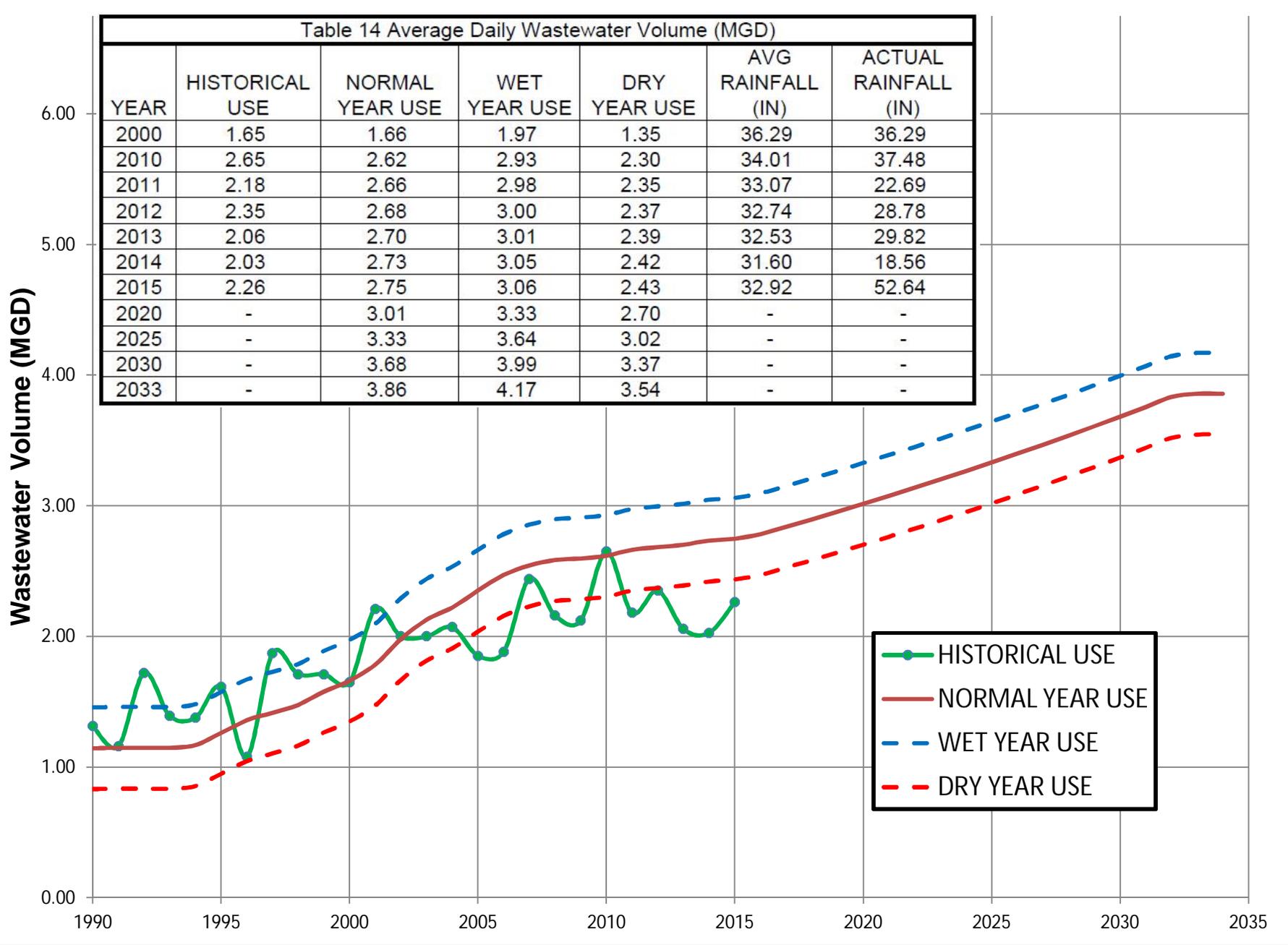
FLOW PROJECTIONS

Accurate sewage flow records are maintained from four (4) metering stations. These flow meters record continuously on monthly circular charts. There are two main factors that affect sewer volumes sent to Fort Worth — population and amount of precipitation. Population can be projected from year to year and generally increases within a predictable range. However, rainfall can vary greatly from year to year and it is difficult to accurately predict how much rainfall will occur in a given year.

Wastewater volume projections are produced within a range, based on set rainfall amounts. Projections are divided into normal, wet, and dry ranges for a given year. **Table 14** shows historical and projected average day volumes.

Table 14 Average Daily Wastewater Volume (MGD)

| YEAR | HISTORICAL USE | NORMAL YEAR USE | WET YEAR USE | DRY YEAR USE | AVG RAINFALL (IN) | ACTUAL RAINFALL (IN) |
|------|----------------|-----------------|--------------|--------------|-------------------|----------------------|
| 2000 | 1.65 | 1.66 | 1.97 | 1.35 | 36.29 | 36.29 |
| 2010 | 2.65 | 2.62 | 2.93 | 2.30 | 34.01 | 37.48 |
| 2011 | 2.18 | 2.66 | 2.98 | 2.35 | 33.07 | 22.69 |
| 2012 | 2.35 | 2.68 | 3.00 | 2.37 | 32.74 | 28.78 |
| 2013 | 2.06 | 2.70 | 3.01 | 2.39 | 32.53 | 29.82 |
| 2014 | 2.03 | 2.73 | 3.05 | 2.42 | 31.60 | 18.56 |
| 2015 | 2.26 | 2.75 | 3.06 | 2.43 | 32.92 | 52.64 |
| 2020 | - | 3.01 | 3.33 | 2.70 | - | - |
| 2025 | - | 3.33 | 3.64 | 3.02 | - | - |
| 2030 | - | 3.68 | 3.99 | 3.37 | - | - |
| 2033 | - | 3.86 | 4.17 | 3.54 | - | - |



SEWER IMPACT FEE CAPITAL IMPROVEMENTS PLAN

Table 15 lists all the projects from the source plans and indicates which projects are eligible for inclusion in this 2016 water impact fee capital improvements plan. This table matches the 2016 CIP list. The projects were previously identified in the following source plans:

- the 2011 Comprehensive Master Plan and CIP (2011 CMP).
- the 2016 Comprehensive Master Plan and CIP (2016 CMP).

Table 15
Sewer Capital Improvements Projects

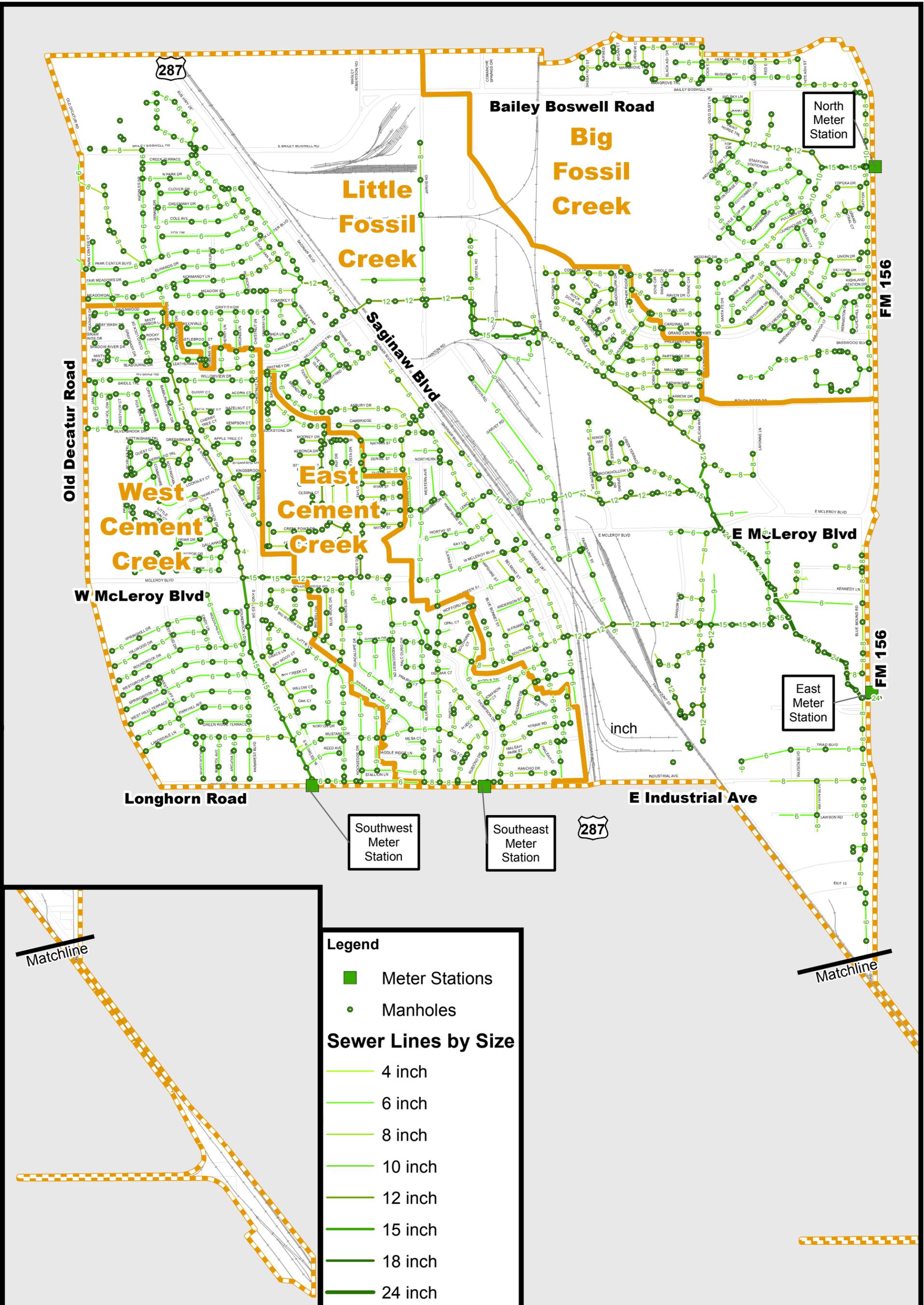
| Description | Project Number in 2011 MP | Project Number in 2016 MP | Status | Eligible for Impact Fees |
|--|---------------------------|---------------------------|---------------------------------------|--------------------------|
| Blue Ridge Trl. 8" Sanitary Sewer | 7 | 1 | Planned for construction in 2016-2017 | Yes |
| S.W. 21" Trunk Main Replacement | 8 | 2 | Planned for construction in 2018-2019 | No |
| Fairmount 12" Sanitary Sewer Rehabilitation | - | 3 | Planned for construction in 2019-2020 | No |
| Infiltration/Inflow (I/I) Study, Phase 1-Continued | 2 | 4 | Planned for 2016-2017 | No |
| Infiltration/Inflow (I/I) Study, Phase 2 | 6 | 5 | Planned for 2017-2018 | No |
| Infiltration/Inflow (I/I) Study, Phase 3 | 12 | 6 | Planned for 2020-2021 | No |
| Infiltration/Inflow (I/I) Study, Phase 4 | 13 | 7 | Planned for 2017-2018 | No |
| Redding Dr. 8" Sanitary Sewer Extension | - | 8 | To be constructed by developers | No |
| Cheyenne Ct. 12" Sanitary Sewer Extension | - | 9 | To be constructed by developers | No |
| Bailey Boswell 12" Sanitary Sewer Extension | - | 10 | To be constructed by developers | No |

Capital Improvements

The projected cost of impact fee eligible system improvements is approximately \$875,893, with \$263,825 being recoverable through impact fees serving the 10-year system needs. The total recoverable cost includes the eligible recoverable cost of previously constructed projects. These capital improvements projects are shown in **Table 16**. Further information about each of these projects is outlined in the City of Saginaw 2016 Master Plan and CIP.

Table 16
City of Saginaw
Sewer Impact Fee Capital Improvements

| Description | 2016 Required Capacity | 2026 Required Capacity | Build Out Required Capacity | Total Project Cost | 2026 Required Capacity (Percent Utilization) | 2026 Projected Recoverable Cost |
|---|------------------------------|------------------------------|-----------------------------------|--------------------------|--|--|
| <i>Future Projects</i> | | | | | | |
| Blue Ridge Trl. 8" Sanitary Sewer | 6" | 8" | 8" | \$220,000 | 44% | \$96,800 |
| Subtotal | | | | \$220,000 | | \$96,800 |
| <i>Previously Constructed Projects</i> | | | | | | |
| S.E. 24" Trunk Main Replacement, Ph. 1 & Ph. 3 | 21" | 24" | 24" | \$634,893 | 23% | \$146,025 |
| 2016 Wastewater Master Plan | - | - | - | \$15,000 | 100% | \$15,000 |
| 2016 Wastewater Impact Fee Update | - | - | - | \$6,000 | 100% | \$6,000 |
| Subtotal | | | | \$655,893 | | \$167,025 |
| Total | | | | \$875,893 | | \$263,825 |



Legend

- Meter Stations
- Manholes

Sewer Lines by Size

- 4 inch
- 6 inch
- 8 inch
- 10 inch
- 12 inch
- 15 inch
- 18 inch
- 24 inch

EWM

City of Saginaw

City of Saginaw, Texas
2016 Water and Sewer Impact Fee Update

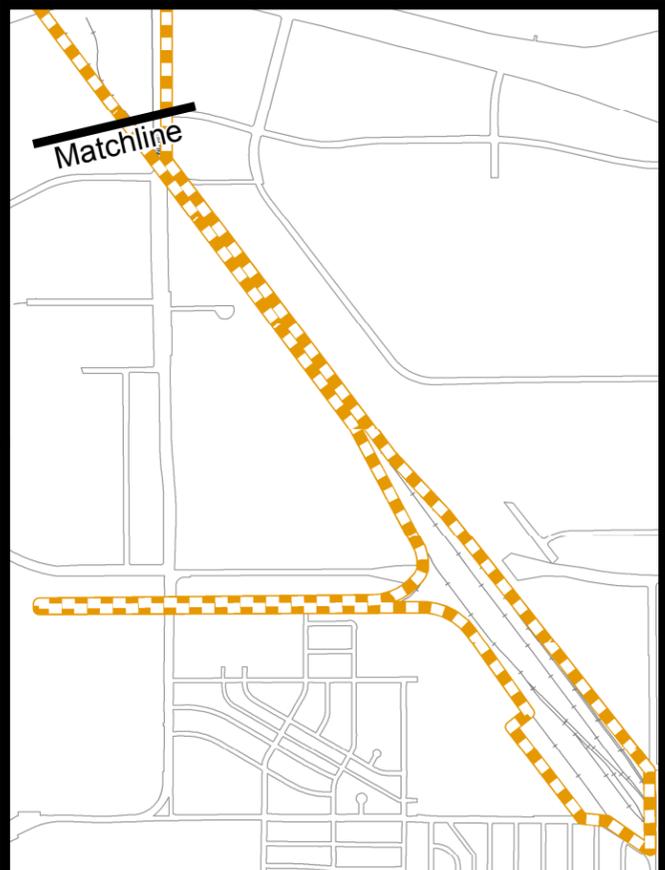
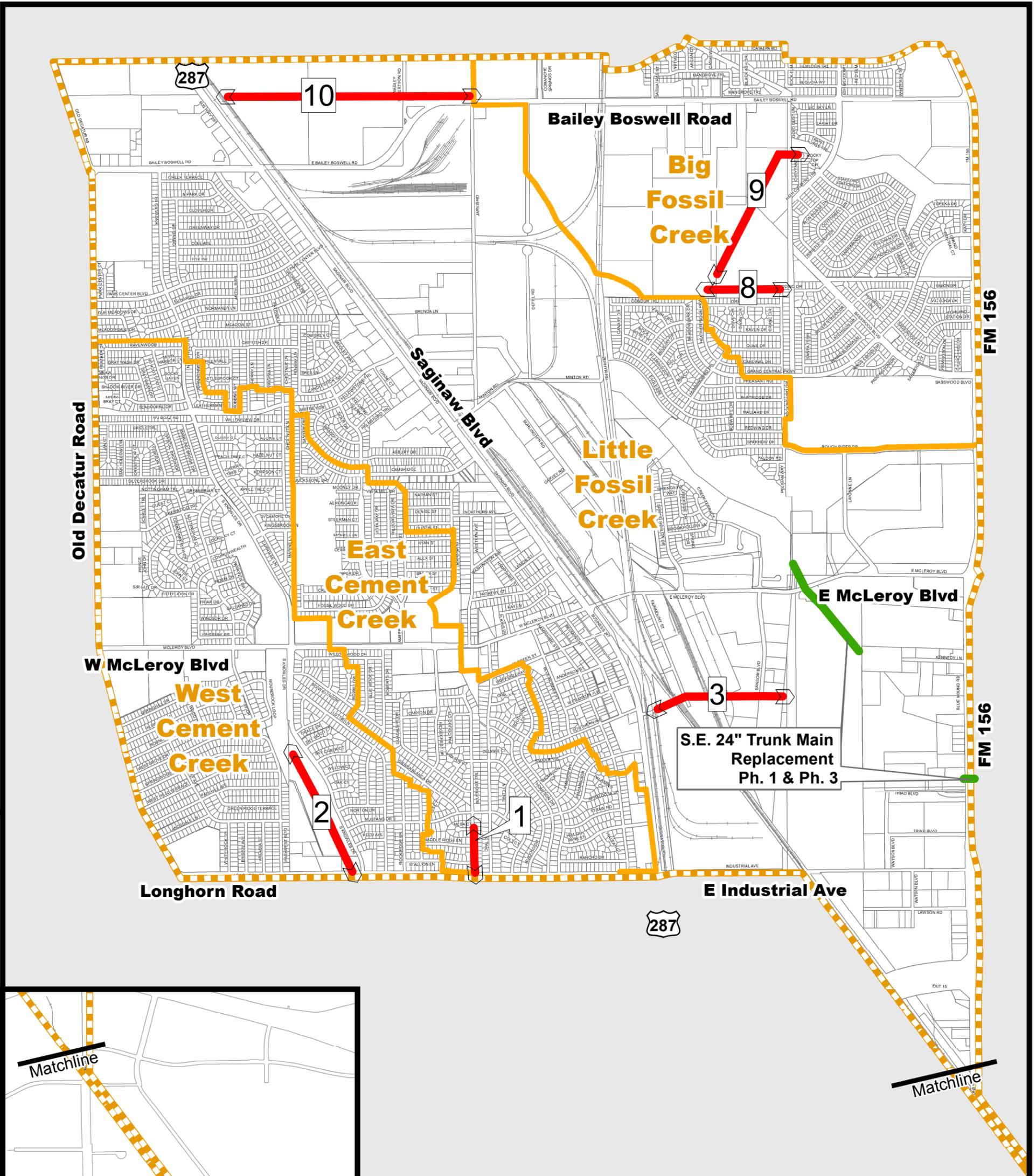
EXISTING WASTEWATER SYSTEM

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September 2016

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- 2016-2021 Wastewater CIP**
- 1) Blue Ridge Trl. 8" Sanitary Sewer
 - 2) S.W. 21" Trunk Main Replacement
 - 3) Fairmont 12" Sanitary Sewer Rehabilitation
 - 4) I&I Study Phase 1 - Continued
 - 5) I&I Study Phase 2
 - 6) I&I Study Phase 3
 - 7) I&I Study Phase 4
 - 8) Redding Dr. 8" Sanitary Sewer Extension
 - 9) Cheyenne Ct. 12" Sanitary Sewer Extension
 - 10) Bailey Boswell 12" Sanitary Sewer Extension



City of Saginaw, Texas
 2016 Water and Sewer Impact Fee Update
WASTEWATER CIP
 Kimley»Horn
 September 2016

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SEWER IMPACT FEE CALCULATION

Chapter 395 of the Local Government Code defines a service unit as follows, ““Service Unit” means a standardized measure of consumption attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards and based on historical data and trends applicable to the political subdivision in which the individual unit of development is located during the previous 10 years.” Therefore, the City of Saginaw defines a service unit based on historical water usage over the past 10 years as compared to the estimated residential units. The residential unit is the development type that predominately uses a 3/4” meter. The measure of consumption per service unit is based on a 3/4” meter and the data shown in **Table 17**.

Table 17
Service Unit Consumption Calculation

| Year | Population | Residential Units (3.14 persons/unit) | Wastewater Flow Average Day Demand (MGD) | Flow per Service Unit (GPD) |
|---|-------------------|--|---|--|
| 2006 | 18,404 | 5,861 | 1.88 | 321 |
| 2007 | 18,950 | 6,035 | 2.44 | 404 |
| 2008 | 19,260 | 6,134 | 2.16 | 352 |
| 2009 | 19,350 | 6,162 | 2.12 | 344 |
| 2010 | 19,500 | 6,210 | 2.65 | 427 |
| 2011 | 19,850 | 6,322 | 2.18 | 345 |
| 2012 | 19,995 | 6,368 | 2.35 | 369 |
| 2013 | 20,140 | 6,414 | 2.06 | 316 |
| 2014 | 20,370 | 6,487 | 2.03 | 313 |
| 2015 | 20,480 | 6,522 | 2.26 | 347 |
| Average Consumption per Service Unit | | | | 354 |

Based on the City’s 10-year growth projections and the resulting wastewater flow projections, wastewater service will be required for an additional 2,684 service units. The calculation is as follows:

A service unit, which is a unit of development that discharges approximately 354 gallons per day (GPD), is a typical residential connection that uses a 3/4” meter. **Table 18** outlines the future wastewater discharge projections and its relationship to the additional service units projected for the next 10-years.

Table 18
10-year Additional Service Unit Calculation

| Year | Average Day Demand (MGD) | Service Unit Demand (GPD) | Service Units |
|---|---------------------------------|----------------------------------|----------------------|
| 2016 | 2.43 | 354 | 6,864 |
| 2026 | 3.38 | 354 | 9,548 |
| 10-year Additional Service Units | | | 2,684 |

Impact fee law allows for a credit calculation to credit back the development community based on the utility revenues or ad valorem taxes that are allocated for paying a portion of future capital improvements. The intent of this credit is to prevent the City from double charging development for future capital improvements via impact fees and utility rates. If the city chooses not to do a financial analysis to determine the credit value they are required by law to reduce the recoverable cost by 50 percent. The city has chosen the latter. Therefore, the maximum recoverable cost for impact fee shown below is 50 percent of the Pre Credit Recoverable Cost.

Table 19 lists a breakdown of the 10-year recoverable costs and the associated impact fee per service unit.

Table 19
10-year Recoverable Cost Breakdown

| | |
|--|------------------|
| Recoverable Impact Fee CIP Costs | \$263,825 |
| Credit for Utility Revenues (50% credit) | \$131,913 |
| Maximum Recoverable Cost for Impact Fee | \$131,913 |

$$\text{Impact fee per service unit} = \frac{\text{10-year recoverable costs}}{\text{10-year additional service units}}$$

$$\text{Impact fee per service unit} = \frac{\$131,913}{2,684}$$

$$\text{Impact fee per service unit} = \$49$$

Therefore, the maximum assessable impact fee per service unit is \$49.

For a development that requires a different size meter, a service unit equivalent is established at a multiplier based on its capacity with respect to the 3/4" meter. The maximum impact fee that could be assessed for other meter sizes is based on the value shown on **Table 20**, Service Unit Equivalency Table for Commonly Used Meters.

Table 20
Maximum Sewer Impact Fee for
Commonly Used Meters

| Meter Size/Type | Service Unit Equivalent | Maximum Assessable Impact Fee (\$) |
|------------------------|--------------------------------|---|
| 3/4" displacement | 1.0 | \$49 |
| 1" displacement | 1.7 | \$83 |
| 1-1/2" displacement | 3.3 | \$162 |
| 2" displacement | 5.3 | \$260 |
| 2" compound | 5.3 | \$260 |
| 2" turbine | 5.3 | \$260 |
| 3" compound | 11.7 | \$573 |
| 3" turbine | 11.7 | \$573 |
| 4" compound | 20.0 | \$980 |
| 4" turbine | 21.0 | \$1,029 |
| 6" compound | 45.0 | \$2,205 |
| 6" turbine | 43.3 | \$2,122 |
| 8" compound | 53.3 | \$2,612 |
| 8" turbine | 93.3 | \$4,572 |
| 10" turbine | 140.0 | \$6,860 |

VI. Impact Fees for Area Cities

To enable the Saginaw City Council and staff members to better understand the broader picture of impact fees, area cities were surveyed to obtain an inventory of the impact fees these cities charge new development. **Table 21** summarizes these impact fees.

SURVEYED CITIES

Cities used in the comparison were selected based on several factors. Hurst was surveyed because they maintain their own water and sewer infrastructure but do not operate their own treatment facilities, which is similar to Saginaw. Arlington and Fort Worth were surveyed because they are the two largest cities in Tarrant County and tend to affect development concerns of the surrounding cities.

Table 21
Current Impact Fees for Area Cities

| WATER | | | | | | | | | | |
|-------------------|---------------------------|-----------------------------|----------------------------|------------------------------|------------------------|-------------------------|----------------------------|-----------------------------|-------------------------|---------------------------|
| Meter Size | Arlington (Actual) | Colleyville (Actual) | Fort Worth (Actual) | Haltom City* (Actual) | Hurst* (Actual) | Keller* (Actual) | Lewisville (Actual) | Lake Worth* (Actual) | Saginaw* Current | Saginaw* (Maximum) |
| 3/4-inch PD | \$ 480 | \$ 9,150 | \$ 469 | \$ 1,167 | - | \$ 1,664 | \$ 2,896 | \$ 704 | \$3,201 | \$ 1,617 |
| 1-inch PD | \$ 840 | \$ 15,250 | \$ 1,173 | \$ 1,948 | \$ 2,153 | \$ 2,644 | \$ 4,923 | \$ 1,173 | \$5,418 | \$ 2,725 |
| 1 1/2-inch PD | \$ 1,920 | \$ 30,500 | \$ 2,345 | - | \$ 4,300 | \$ 3,231 | \$ 9,557 | \$ 2,345 | \$12,576 | \$ 5,358 |
| 2-inch PD | \$ 3,360 | \$ 48,800 | \$ 3,752 | \$ 6,218 | \$ 6,881 | \$ 10,476 | \$ 19,403 | \$ 3,752 | \$16,998 | \$ 8,591 |
| 2-inch Compound | \$ 3,360 | \$ 48,800 | \$ 3,752 | \$ 6,218 | \$ 6,881 | \$ 10,476 | \$ 19,403 | \$ 3,752 | \$16,998 | \$ 8,591 |
| 2-inch Turbine | \$ 3,360 | \$ 61,000 | \$ 3,752 | \$ 6,218 | \$ 6,881 | \$ 10,476 | \$ 19,403 | \$ 3,752 | \$16,998 | \$ 8,591 |
| 3-inch Compound | \$ 7,680 | \$ 97,600 | \$ 10,201 | - | \$ 16,071 | \$ 20,855 | \$ 46,336 | - | \$36,923 | \$ 20,883 |
| 3-inch Turbine | \$ 7,680 | \$ 146,400 | \$ 10,201 | - | \$ 16,071 | \$ 20,855 | \$ 46,336 | - | \$39,420 | \$ 20,883 |
| 4-inch Compound | \$ 13,440 | \$ 152,500 | \$ 17,588 | \$ 19,446 | \$ 27,373 | \$ 32,604 | \$ 81,088 | - | \$59,294 | \$ 35,848 |
| 4-inch Turbine | \$ 13,440 | \$ 256,200 | \$ 17,588 | \$ 19,446 | \$ 27,373 | \$ 32,604 | \$ 81,088 | - | \$67,535 | \$ 36,761 |
| 6-inch Compound | \$ 30,720 | \$ 305,000 | \$ 37,520 | \$ 38,881 | \$ 57,085 | \$ 65,306 | \$ 177,525 | - | \$120,682 | \$ 78,605 |
| 6-inch Turbine | \$ 30,720 | \$ 561,200 | \$ 37,520 | \$ 38,881 | \$ 57,085 | \$ 65,306 | \$ 177,525 | - | \$141,659 | \$ 77,053 |
| 8-inch Compound | \$ 48,000 | \$ 488,000 | \$ 65,660 | \$ 62,211 | \$ 112,620 | \$ 104,470 | \$ 300,315 | - | \$198,768 | \$ 114,323 |
| 8-inch Turbine | \$ 48,000 | \$ 976,000 | \$ 65,660 | \$ 62,211 | \$ 112,620 | \$ 104,470 | \$ 300,315 | - | \$215,501 | \$ 150,843 |
| 10-inch Compound | \$ 72,000 | - | \$ 98,490 | \$ 89,438 | \$ 172,845 | \$ 150,096 | \$ 482,763 | - | \$290,036 | - |
| 10-inch Turbine | \$ 72,000 | \$ 1,525,000 | \$ 98,490 | \$ 89,438 | \$ 172,845 | \$ 150,096 | \$ 482,763 | - | \$339,983 | \$ 226,310 |

| SEWER (water) | | | | | | | | | | |
|----------------------|---------------------------|-----------------------------|----------------------------|------------------------------|------------------------|------------------------|----------------------------|-----------------------------|-------------------------|---------------------------|
| Meter Size | Arlington (Actual) | Colleyville (Actual) | Fort Worth (Actual) | Haltom City* (Actual) | Hurst* (Actual) | Keller (Actual) | Lewisville (Actual) | Lake Worth* (Actual) | Saginaw* Current | Saginaw* (Maximum) |
| 3/4-inch PD | \$ 380 | \$ 2,521 | \$ 452 | \$ 2,115 | \$ 1,174 | \$ 1,560 | \$ 1,971 | \$ 678 | \$ 1,047 | \$ 727 |
| 1-inch | \$ 665 | \$ 6,303 | \$ 1,129 | \$ 3,533 | \$ 2,335 | \$ 2,479 | \$ 3,351 | \$ 1,129 | \$ 1,756 | \$ 1,212 |
| 1 1/2-inch | \$ 1,520 | \$ 12,605 | \$ 2,258 | - | \$ 4,662 | \$ 3,029 | \$ 6,504 | \$ 2,258 | \$ 2,144 | \$ 2,420 |
| 2-inch | \$ 2,660 | \$ 20,168 | \$ 3,612 | \$ 11,075 | \$ 7,460 | \$ 9,823 | \$ 13,206 | \$ 3,612 | \$ 4,829 | \$ 3,872 |
| 2-inch Compound | \$ 2,660 | \$ 20,168 | \$ 3,612 | \$ 11,075 | \$ 7,460 | \$ 9,823 | \$ 13,206 | \$ 3,612 | \$ 4,829 | \$ 3,872 |
| 2-inch Turbine | \$ 2,660 | \$ 25,210 | \$ 3,612 | \$ 11,075 | \$ 7,460 | \$ 9,823 | \$ 13,206 | \$ 3,612 | \$ 4,829 | \$ 3,872 |
| 3-inch Compound | \$ 6,080 | \$ 40,336 | \$ 9,820 | - | \$ 17,040 | \$ 19,553 | \$ 31,536 | - | \$ 13,766 | \$ 10,393 |
| 3-inch Turbine | \$ 6,080 | \$ 60,504 | \$ 9,820 | - | \$ 17,040 | \$ 19,553 | \$ 31,536 | - | \$ 14,134 | \$ 10,393 |
| 4-inch Compound | \$ 10,640 | \$ 63,025 | \$ 16,932 | \$ 35,263 | \$ 29,238 | \$ 30,569 | \$ 55,188 | - | \$ 23,090 | \$ 17,912 |
| 4-inch Turbine | \$ 10,640 | \$ 105,882 | \$ 16,932 | \$ 35,263 | \$ 29,238 | \$ 30,569 | \$ 55,188 | - | \$ 24,307 | \$ 17,961 |
| 6-inch Compound | \$ 24,320 | \$ 126,050 | \$ 36,120 | \$ 70,504 | \$ 60,182 | \$ 61,230 | \$ 120,822 | - | \$ 48,399 | \$ 38,325 |
| 6-inch Turbine | \$ 24,320 | \$ 231,932 | \$ 36,120 | \$ 70,504 | \$ 60,182 | \$ 61,230 | \$ 120,822 | - | \$ 51,497 | \$ 38,242 |
| 8-inch Compound | \$ 38,000 | \$ 201,680 | \$ 63,210 | \$ 112,811 | \$ 120,970 | \$ 97,951 | \$ 204,393 | - | \$ 82,864 | \$ 65,822 |
| 8-inch Turbine | \$ 38,000 | \$ 403,360 | \$ 63,210 | \$ 112,811 | \$ 120,970 | \$ 97,951 | \$ 204,393 | - | \$ 85,335 | \$ 67,782 |
| 10-inch Compound | \$ 57,000 | - | \$ 94,815 | \$ 162,183 | \$ 186,271 | \$ 140,729 | \$ 328,566 | - | \$ 123,098 | - |
| 10-inch Turbine | \$ 57,000 | \$ 630,250 | \$ 94,815 | \$ 162,183 | \$ 186,271 | \$ 140,729 | \$ 328,566 | - | \$ 130,472 | \$ 101,675 |

* Includes City of Fort Worth Impact Fees

VII. Conclusions and Recommendations

It will be possible for Saginaw to assess and collect impact fees to recover capital expenditures associated with water and sewer systems improvements.

We recommend that Saginaw assess City of Fort Worth impact fees as part of the total impact fees. **Table 22** presents the maximum Saginaw impact fees, City of Fort Worth impact fees, and the maximum impact fee Saginaw may assess for water and sewer.

This report establishes the maximum allowable impact fees which could be assessed by the City of Saginaw. It is intended to serve as a guide to assessing impact fees pertaining to the water distribution system and the sewer collection system based on future growth. Following the public hearing process, the City Council may establish an amount to be assessed (if any) up to this maximum.

The water and sewer impact fee study update is complete in terms of information and calculations. The next steps will be for the development community and the City's Capital Improvement Advisory Committee (CIAC) to receive the impact fee study, to provide questions and comments to the City staff and then ultimately, to submit comments to the City Council.

The steps that are required of the City Council are to establish and advertise the public hearing date, make the impact fee report available to the public, hold a public hearing, make a policy decision on the Actual Impact Fee to collect, and to pass an impact fee ordinance to include the Maximum Impact Fee and the Actual Impact Fee to be collected.

Table 22
Maximum Assessable Impact Fee Summary

| Size | Maximum Assessable Water Impact Fee (\$) | | | Maximum Assessable Sewer Impact Fee (\$) | | |
|---------------------|---|-----------|------------------|---|---------|------------------|
| | Fort Worth | Saginaw | Total* | Fort Worth | Saginaw | Total* |
| 3/4" displacement | \$704 | \$913 | \$1,617 | \$678 | \$49 | \$727 |
| 1" displacement | \$1,173 | \$1,552 | \$2,725 | \$1,129 | \$83 | \$1,212 |
| 1-1/2" displacement | \$2,345 | \$3,013 | \$5,358 | \$2,258 | \$162 | \$2,420 |
| 2" displacement | \$3,752 | \$4,839 | \$8,591 | \$3,612 | \$260 | \$3,872 |
| 2" compound | \$3,752 | \$4,839 | \$8,591 | \$3,612 | \$260 | \$3,872 |
| 2" turbine | \$3,752 | \$4,839 | \$8,591 | \$3,612 | \$260 | \$3,872 |
| 3" compound | \$10,201 | \$10,682 | \$20,883 | \$9,820 | \$573 | \$10,393 |
| 3" turbine | \$10,201 | \$10,682 | \$20,883 | \$9,820 | \$573 | \$10,393 |
| 4" compound | \$17,588 | \$18,260 | \$35,848 | \$16,932 | \$980 | \$17,912 |
| 4" turbine | \$17,588 | \$19,173 | \$36,761 | \$16,932 | \$1,029 | \$17,961 |
| 6" compound | \$37,520 | \$41,085 | \$78,605 | \$36,120 | \$2,205 | \$38,325 |
| 6" turbine | \$37,520 | \$39,533 | \$77,053 | \$36,120 | \$2,122 | \$38,242 |
| 8" compound | \$65,660 | \$48,663 | \$114,323 | \$63,210 | \$2,612 | \$65,822 |
| 8" turbine | \$65,660 | \$85,183 | \$150,843 | \$63,210 | \$4,572 | \$67,782 |
| 10" turbine | \$98,490 | \$127,820 | \$226,310 | \$94,815 | \$6,860 | \$101,675 |

***Total includes current City of Fort Worth Impact Fees.**