



San Antonio River Authority

2020 MARTINEZ IV SERVICE AREA WASTEWATER LAND USE ASSUMPTIONS & CIP REPORT



PREPARED FOR:

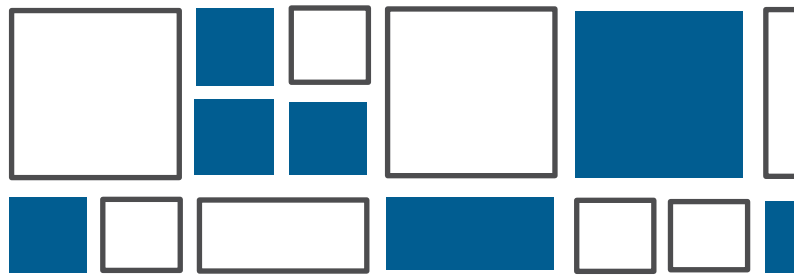
San Antonio River Authority

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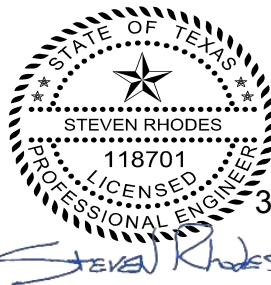
SAN ANTONIO
RIVER AUTHORITY



MARTINEZ IV WASTEWATER LAND USE ASSUMPTIONS & WASTEWATER CIP

Prepared for:

San Antonio River Authority



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



**SAN ANTONIO
RIVER AUTHORITY**

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FNI Project Number: SAR20328

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EXECUTIVE SUMMARY

BACKGROUND

Freese and Nichols, Inc. (FNI) was retained by the San Antonio River Authority (River Authority) to perform an impact fee analysis on the Authority's Martinez IV wastewater system. The purpose of this report is to summarize the methodology used in the development land use assumptions and a wastewater capital improvement plan for the River Authority. The methodology used herein satisfies the requirements of the Texas Local Government Code Section 395 for the establishment and update of water and wastewater impact fees.

LAND USE ASSUMPTIONS

Population and land use are important elements in the analysis of wastewater systems. Wastewater flows depend on the population served by the system and determine the sizing and location of system infrastructure. A thorough analysis of existing population and land use, along with planned developments and likely densities and distributions, provides the basis for projecting future wastewater flows.

Existing and future population within the Martinez IV service area was determined through a review of planned developments, developable land, and City of San Antonio and the River Authority's population growth information. The projected connections for the 2020, 2025, 2030, and Buildout planning periods utilized for the purpose of the study are summarized in **Table ES-1**. The Buildout planning period is defined as the full utilization of the developable land, based on the land use assumptions, within the service area.

WASTEWATER FLOW PROJECTIONS

Wastewater flows in a municipal collection system vary by time of day, wastewater discharge source and weather conditions. Wastewater flows were projected for 2020, 2025, and 2030 conditions using per-capita flows applied to the projected EDUs. The future wastewater flow rates were selected to align with historical wastewater flows. Future average day wastewater flows were developed using a wastewater flow rate per EDU per day. The peak wet weather flow was determined by calculating the peak dry flow and adding an I/I allowance of 300 gallons per acre served. The projected average day and peak wet weather flows for each planning period by basin are summarized in **Table ES-1**.

Table ES-1: Wastewater Growth and Flow Projections by Planning Year

Planning Period	Wastewater Connections	Average Day Flow (MGD)	Peak Wet Weather Flow (MGD)
2020	2,242	0.54	1.52
2025	6,868	1.65	4.68
2030	10,543	2.53	7.09
Buildout	70,869	17.01	46.14

WASTEWATER CAPITAL IMPROVEMENT PLAN

A capital improvements plan (CIP) was developed for the Martinez IV Service Area to ensure the wastewater system will effectively and efficiently continue to convey flow to the wastewater treatment plant. The projected wastewater loads for the 2020, 2025, 2030, and Buildout planning periods were applied to the hydraulic model. Capital improvement projects were developed based on a hydraulic analysis of the wastewater system, which utilized the Innovyze InfoSewer software package. Proposed improvements were sized to convey projected Buildout wastewater flows and phased based on growth projections for each planning period. Locations shown for new mains and other recommended improvements were generalized for hydraulic analyses. Specific alignments and sites will be determined as part of the design process. The proposed Wastewater CIP Projects and the associated costs are summarized in **Table ES-2**. Detailed descriptions of the projects and associated costs are included in **Appendix A**.

Table ES-2: 10-year Wastewater CIP Summary

Project No.	Construction Priority	Project Name	Cost In 2020 Dollars
29	A	Proj. #29 Basin Three Wastewater 27/33/36-inch Interceptor and Lift Station Decommission	\$ 19,521,100
6	B	Proj. #6 New 3.1 MGD Martinez IV Wastewater Treatment Plant	\$ 55,614,000
17	C	Proj. #17 New 4.0 MGD Abbott Road Lift Station	\$ 6,129,500
5	D	Proj. #5 Basin Three 18-inch Wastewater Main	\$ 2,616,300
8	E	Proj. #8 Basin Two 15/18/21/24/27-inch Wastewater Interceptor	\$ 5,108,500
9	F	Proj. #9 Basin Three 10/12-inch Wastewater Main	\$ 1,282,800
15	G	Proj. #15 Basin Three 10/12-inch Wastewater Main	\$ 1,327,600
11	H	Proj. #11 Basin Four 15-inch Wastewater Main	\$ 1,838,900
16	I	Proj. #16 Basin Four 12/15-inch Wastewater Main	\$ 1,147,500
22	J	Proj. #22 Basin Six 12/15-inch Wastewater Main and 18/21/24/27/30-inch Wastewater Interceptor	\$ 4,561,100
32	K	Proj. #32 Basin Six 10/12-inch Wastewater Main	\$ 1,496,500
10-year CIP Total			\$ 100,643,800

1.0 BACKGROUND

Chapter 395 of the Texas Local Government Code requires an impact fee analysis before impact fees can be created and assessed. Chapter 395 defines an impact fee as “a charge or assessment imposed by a political subdivision against new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development.” In September 2001, Senate Bill 243 amended Chapter 395 thus creating the current procedure for implementing impact fees. Chapter 395 identifies the following items as impact fee eligible costs:

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

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

- Construction, acquisition, or expansion of public facilities or assets other than those identified on the capital improvements plan
- Repair, operation, or maintenance of existing or new capital improvements
- Upgrading, updating, expanding, or replacing existing capital improvements to serve existing development in order to meet stricter safety, efficiency, environmental, or regulatory standards
- Upgrading, updating, expanding, or replacing existing capital improvements to provide better service to existing development
- Administrative and operating costs of the political subdivision
- Principal payments and interest or other finance charges on bonds or other indebtedness, except as allowed above

The purpose of this report is to summarize the methodology used in the development and calculation of wastewater impact fees for the River Authority. The methodology used herein satisfies the requirements of the Texas Local Government Code Section 395 for the establishment and update of wastewater impact fees.

2.0 LAND USE ASSUMPTIONS

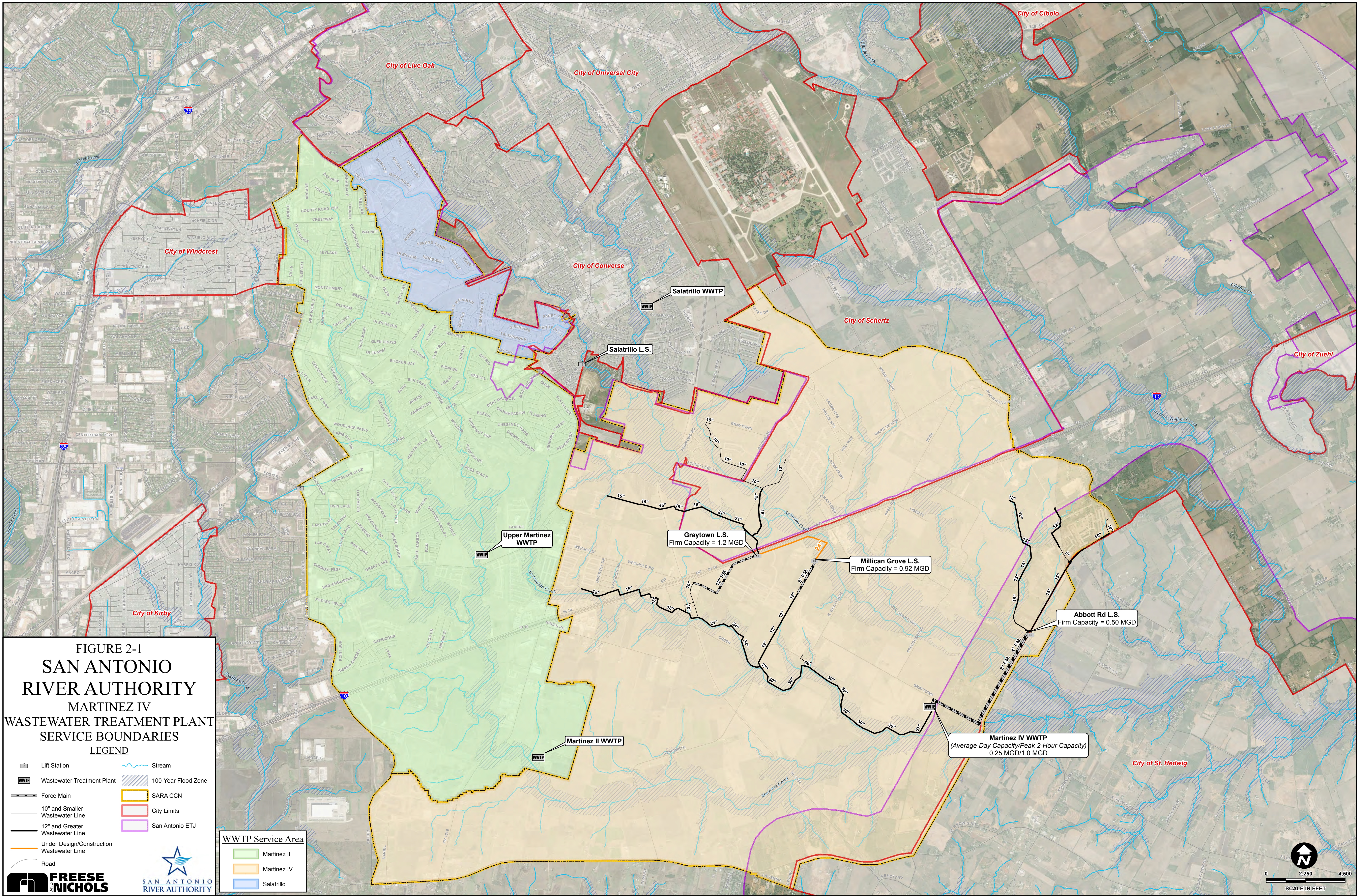
Population and land use are important elements in the analysis of wastewater systems. Wastewater flows depend on the population served by the system and determine the sizing and location of system infrastructure. A thorough analysis of existing population and land use, along with planned developments and likely densities and distributions, provides the basis for projecting future wastewater flows.

2.1 SERVICE AREA

The Martinez IV service area is located entirely within Bexar County, specifically in the generally undeveloped area east of the City of San Antonio. **Figure 2-1** illustrates the Martinez IV service area.

2.2 LAND USE TYPE

In addition to historical data, FNI also gathered information on the future land use anticipated in the Martinez IV service area. A thorough analysis of the Bexar County and City of Schertz future land use plans provided insight into the potential future development. The 100-year floodplain within the service area was delineated by the land use plans and was not considered for the population projections. The River Authority staff also provided input on the expected land use based on development activity and thoroughfare land use planning in the area. Having reviewed the collected information and the River Authority input, FNI developed land use assumptions for the Martinez IV service area, as shown on **Figure 2-2**.



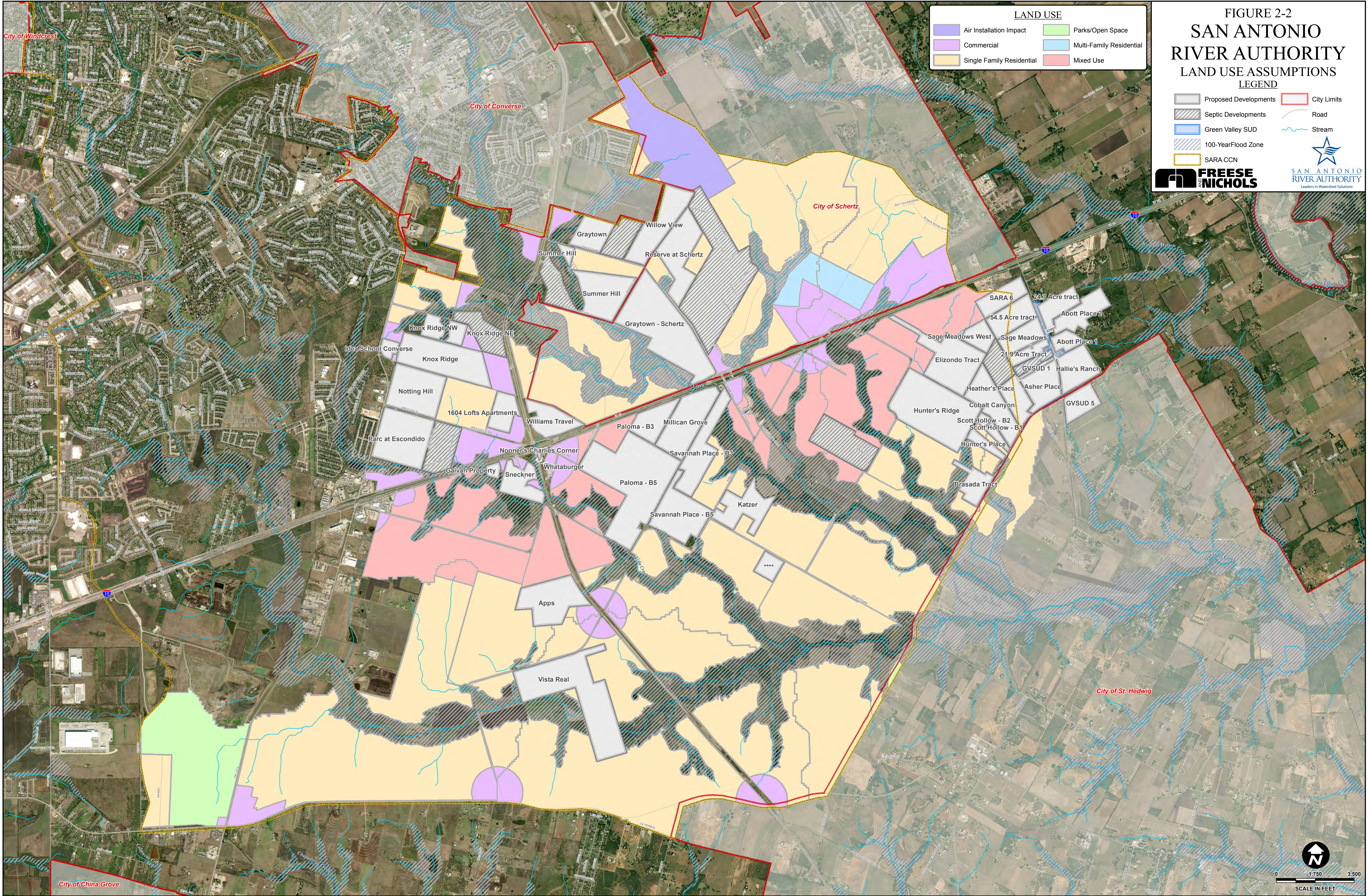


FIGURE 2-2
**SAN ANTONIO
RIVER AUTHORITY**
LAND USE ASSUMPTIONS
LEGEND

Proposed Developments	City Limits
Septic Developments	Road
Green Valley SUD	Stream
100-Year Flood Zone	
SARA CCN	

LAND USE

Air Installation Impact	Parks/Open Space
Commercial	Multi-Family Residential
Single Family Residential	Mixed Use

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2.3 GROWTH PROJECTIONS

Growth projections were calculated using historical connection data provided by the River Authority. Currently, there are 2,934 active connections within the Martinez IV service area, as summarized in **Table 2-1**.

Table 2-1: Historical Yearly and Total Active Connections Summary

Year	Yearly Connections	Cumulative Connections
2010	4	38
2011	15	53
2012	34	87
2013	72	159
2014	54	213
2015	94	307
2016	99	406
2017	183	589
2018	410	999
2019	593	1,592
2020	1,342	2,934

FNI developed land use assumptions for the Martinez IV service area, as shown on **Figure 2-2**. The known developments provided by the River Authority staff are outlined in gray on **Figure 2-2**. For each land use type, the number of equivalent dwelling units (EDUs) was calculated. One EDU represents the level of service that would be required by one single family dwelling. The number of EDUs per acre for each land use type is summarized in **Table 2-2**. The Land Use Type designation relates to all areas of the River Authority's CCN that are located East of 1604 and South of Interstate 10. The areas associated East of 1604 and North of Interstate 10 are within the City of Schertz city limits and designated as Single Family with a density of 4.0 EDUs/Acre.

Table 2-2: Equivalent Dwelling Units Per Acre

Land Use Type	Definition	EDU/Acre
Air Installation Impact (Schertz)	Low-Rise Single Family Homes	4
Single Family Residential (Schertz)	Single Family Homes	4
Single Family Residential	Single Family Homes	6
Multi-Family Residential	Multi-Family Residences	14
Parks/Open Space	Parks/Open Space/Floodplain	0
Mixed Use	Both Multi-Family Residential & Commercial	11.9
Commercial	Business, Retail, Restaurants, Office Space	5.6

Based on this data, recent development throughout the service area, and correspondence with the River Authority, a varying EDU growth rate was utilized for the 10-year planning horizon. This was utilized as the service area is projected to grow dramatically faster in the short term than the long term. During the 5-year planning period, many of the known developments are expected to buildout, resulting in a rate of 925 EDUs/year to the 2025 planning year. After the 5-year planning period, a uniform growth rate of 600 EDUs/year was utilized to the 2030 planning year. The Buildout planning period is defined as the full utilization of the developable land, based on the land use assumptions, within the service area. **Table 2-3** summarizes the number of connections within the Martinez IV service area for 2020, 2025, 2030, and Buildout planning periods.

Table 2-3: Summary of EDUs by Planning Period

Planning Period	Wastewater Connections
2020	2,242
2025	6,868
2030	10,543
Buildout	70,869

2.4 WASTEWATER FLOW PROJECTIONS

Wastewater flows in a municipal collection system vary by time of day, wastewater discharge source and weather conditions. Average daily flow is defined as the total wastewater flow over a one-year period divided by the number of days in that year. Wastewater treatment plants are typically sized in terms of average daily flow. The collection system is sized to convey peak wastewater flows. Wastewater flows were projected for 2020, 2025, and 2030 conditions using per-capita flows applied to the projected EDUs,

presented in **Section 2.3**. An example calculation for average day flow, peak day flow, and peak wet weather flow are shown in **Equation 4-1, 4-2, and 4-3**, respectively.

The future wastewater flow rates were selected to align with historical wastewater flows. Future average day wastewater flows were developed using a wastewater flow rate per EDU per day. The peak wet weather flow was determined by calculating the peak dry flow and adding an I/I allowance of 300 gallons per acre served. The SAWS *Lift Station Design & Construction Guidelines* were utilized to develop the projected wastewater flows as summarized in **Table 2-4**.

Table 2-4: Wastewater Flow Design Criteria

Average Day Flow (Gallons/EDU/Day)	Average Dry Day to Peak Dry Flow Factor	Inflow and Infiltration Allowance (Gallons/Acre)
240	2.5	300

Sample calculations below reference an Example development that covers an area of 150 Acres and includes 500 EDUS.

Equation 2-1: Average Day Flow (MGD)

$$\text{Average Day Flow (MGD): } \text{EDU Count} * \frac{\frac{\text{Gallons}}{\text{EDU}}}{\text{Days}} * 1/1,000,000 \text{ Gallons/Million Gallons}$$

$$\text{Example ADF: } 500 \text{ EDU} * 240 \text{ Gallons/EDU/Day} * 1/1,000,000 \text{ Gallons/Million Gallons} \\ = 0.12 \text{ MGD}$$

Equation 2-2: Peak Day Flow (MGD)

$$\text{Peak Dry Flow (MGD): } \text{ADF (MGD)} * \text{Average Dry Day to Peak Dry Flow Factor}$$

$$\text{Example PDF (MGD): } 0.12 \text{ MGD} * 2.5 = 0.30 \text{ MGD}$$

Equation 2-3: Peak Wet Weather Flow (MGD)

$$\text{Peak Wet Weather Flow (MGD): } \text{PDF (MGD)}$$

$$+ \text{Area (AC)} * \text{Inflow and Infiltration (Gallons/Acre)}$$

$$\text{Example PWF (MGD): } 0.3 \text{ MGD} + 500 \text{ Acres} * 300 \text{ Gallons/Acre}$$

$$* 1/1,000,000 \text{ Gallons/Million Gallons} = 0.45 \text{ MGD}$$

The projected average day and peak wet weather flows for each planning year by basin are summarized in **Table 2-5**.

Table 2-5: Wastewater Flow Projections by Planning Year

Planning Period	Average Day Flow (MGD)	Peak Wet Weather Flow (MGD)
2020	0.54	1.52
2025	1.65	4.68
2030	2.53	7.09
Buildout	17.01	46.14

3.0 WASTEWATER CAPITAL IMPROVEMENTS PLAN

A capital improvements plan (CIP) was developed for the Martinez IV Service Area to ensure the wastewater system will effectively and efficiently continue to convey flow to the wastewater treatment plant. The projected wastewater loads for the 2020, 2030, and Buildout planning periods were applied to the hydraulic model. Capital improvement projects were developed based on a hydraulic analysis of the wastewater system, which utilized the Innovyze InfoSewer software package. Proposed improvements were sized to convey projected Buildout wastewater flows and phased based on growth projections for each planning period. Locations shown for new mains and other recommended improvements were generalized for hydraulic analyses. Specific alignments and sites will be determined as part of the design process.

3.1 WASTEWATER SYSTEM IMPROVEMENTS

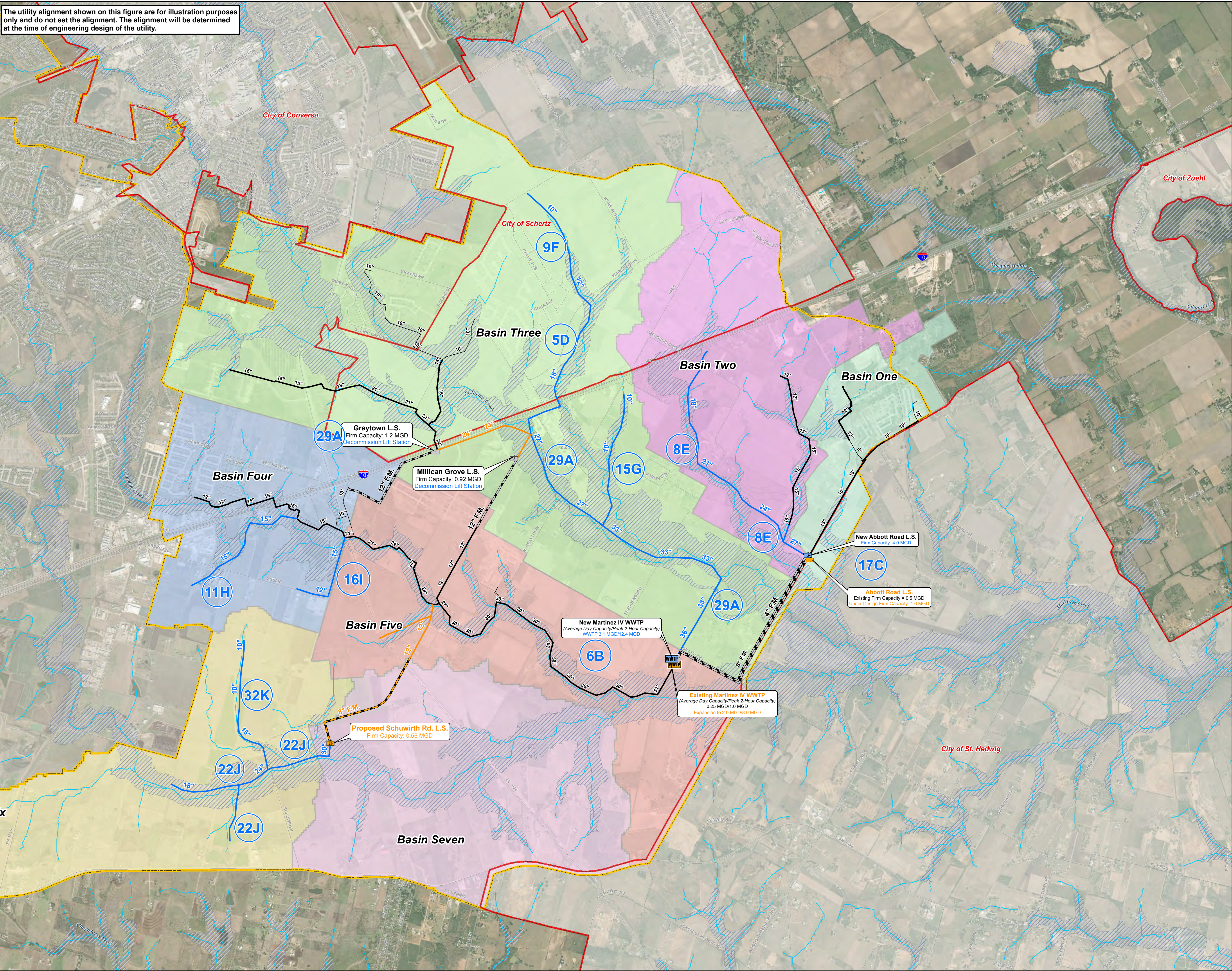
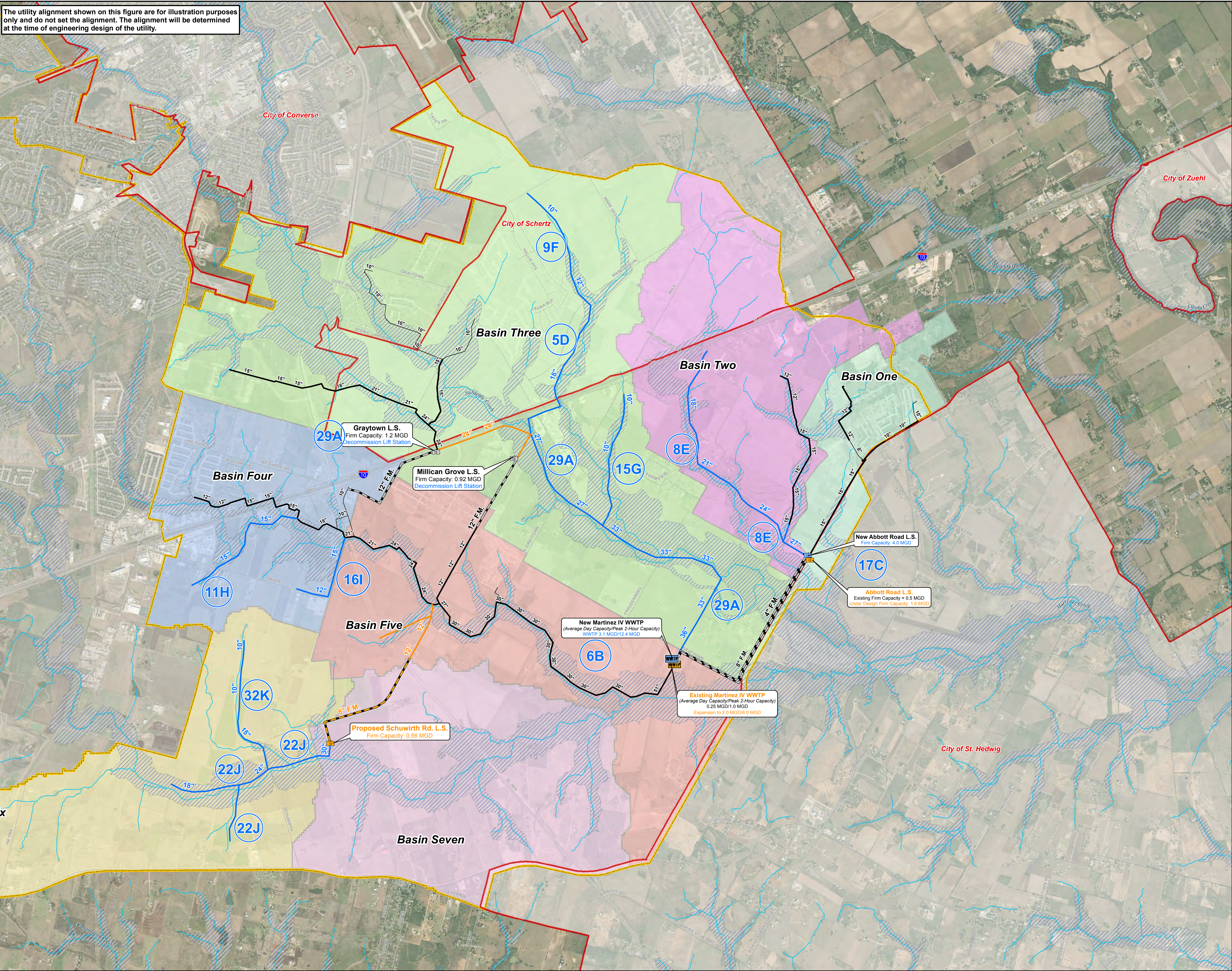
Proposed wastewater CIP projects in the 2020 to 2030 planning period are illustrated on **Figure 3-1**. Each project has a recommended construction priority, which is designated by a letter, in addition to a project number. The project number correlates to the previous Wastewater CIP project number, whereas the construction priority reflects the order of which the projects should be constructed. The proposed Wastewater CIP Projects and the associated costs are summarized in **Table 3-1**. Capital costs were calculated for each CIP project and do not include individual service connections or subdivision lines. The costs are in 2020 dollars and include an allowance for engineering, surveying, and contingencies. Cost estimates do not include allowances for right-of-way acquisition. Detailed descriptions of the projects and associated costs are included in **Appendix A**. Lift Station expansion costs take into consideration the installation of pumps, piping, miscellaneous valves/appurtenances, site work, wet well expansion/repair, and by-pass pumping. Unit prices shown in the cost summaries are assumed to include direct project costs, overhead, and profit for the contractors.

Table 3-1: 10-year Wastewater CIP Summary

Project No.	Construction Priority	Project Name	Cost In 2020 Dollars
29	A	Proj. #29 Basin Three Wastewater 27/33/36-inch Interceptor and Lift Station Decommission	\$ 19,521,100
6	B	Proj. #6 New 3.1 MGD Martinez IV Wastewater Treatment Plant	\$ 55,614,000
17	C	Proj. #17 New 4.0 MGD Abbott Road Lift Station	\$ 6,129,500
5	D	Proj. #5 Basin Three 18-inch Wastewater Main	\$ 2,616,300
8	E	Proj. #8 Basin Two 15/18/21/24/27-inch Wastewater Interceptor	\$ 5,108,500
9	F	Proj. #9 Basin Three 10/12-inch Wastewater Main	\$ 1,282,800
15	G	Proj. #15 Basin Three 10/12-inch Wastewater Main	\$ 1,327,600
11	H	Proj. #11 Basin Four 15-inch Wastewater Main	\$ 1,838,900
16	I	Proj. #16 Basin Four 12/15-inch Wastewater Main	\$ 1,147,500
22	J	Proj. #22 Basin Six 12/15-inch Wastewater Main and 18/21/24/27/30-inch Wastewater Interceptor	\$ 4,561,100
32	K	Proj. #32 Basin Six 10/12-inch Wastewater Main	\$ 1,496,500
10-year CIP Total			\$ 100,643,800

The utility alignment shown on this figure are for illustration purposes only and do not set the alignment. The alignment will be determined at the time of engineering design of the utility.

The utility alignment shown on this figure are for illustration purposes only and do not set the alignment. The alignment will be determined at the time of engineering design of the utility.



Appendix A

10-year CIP Project Cost Sheets

San Antonio River Authority



Capital Improvement Cost Estimate

January, 2021

Construction Priority Number: A

Phase: 5 year

Project Name:

Proj. #29 Basin Three Wastewater 27/33/36-inch Interceptor and Lift Station Decommission

Project Description:

This project consists of constructing a 27/33/36-inch trunk line from Millican Grove lift station to the Martinez IV WWTP. This project will connect to the 24-inch sewer main, currently under construction, between the Graytown lift station and Millican Grove lift station. Once completed, the proposed sewer interceptor would allow the Graytown lift station and Millican Grove lift station to be decommissioned. This project will be required once the number of active connections upstream of Graytown lift station exceeds 2,500 EDUs.




Project Drivers:



The purpose of this project is to relieve flows entering Millican Grove lift station. This project will be required once the number of active connections upstream of Graytown lift station exceeds 2,500 EDUs.



Opinion of Probable Construction Cost



ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	36" Tunnel	700	LF	\$ 2,000	\$ 1,400,000
2	33" Tunnel	3,700	LF	\$ 1,800	\$ 6,660,000
3	33" Pipe 8- 16 feet deep	5,500	LF	\$ 380	\$ 2,090,000
4	27" Pipe 8- 16 feet deep	5,100	LF	\$ 320	\$ 1,632,000
5	18" Pipe 8- 16 feet deep	450	LF	\$ 220	\$ 99,000
6	72" Diameter Manhole	20	EA	\$ 15,000	\$ 300,000
7	60" Diameter Manhole	10	EA	\$ 12,000	\$ 120,000
8	Lift Station - Decomm	2	LS	\$ 100,000	\$ 200,000
9	Tunnel Shaft	2	LS	\$ 200,000	\$ 400,000
10	Per Vertical Foot > 8', 72" Manhole	80	LF	\$ 1,000	\$ 80,000
11	Per Vertical Foot > 8', 60" Manhole	90	LF	\$ 850	\$ 76,500
SUBTOTAL:					\$ 13,057,500
CONTINGENCY				30%	\$ 3,917,300
SUBTOTAL:					\$ 16,974,800
ENG/SURVEY				15%	\$ 2,546,300
SUBTOTAL:					\$ 19,521,100
Estimated Project Total In 2020 Dollars:					\$ 19,521,100

San Antonio River Authority		FREESE AND NICHOLS		SAN ANTONIO RIVER AUTHORITY Leading in Wastewater Solutions	
Capital Improvement Cost Estimate				January, 2021	
Construction Priority Number: B				Phase: 10 year	
Project Name:		Proj. #6 New 3.1 MGD Martinez IV Wastewater Treatment Plant			
Project Description:					
This project consists of constructing a new wastewater treatment plant with an average day capacity of 3.10 MGD. Based on the wastewater flow projections an expansion will be required by 2025. The proposed 3.10 MGD plant would increase the total capacity of the system to 5.10 MGD by combining the currently under design 2.00 MGD expansion of the existing Martinez IV treatment plant. The combined capacity of the treatment plants is projected to provide average day capacity to 2040. The proposed facility would have an initial capacity of 3.10 MGD and an ultimate capacity of 20.25 MGD. The proposed ultimate capacity provides sufficient capacity to serve the projected buildout wastewater flow, allowing the existing plant to be decommissioned.					
Project Drivers:					
Based on the wastewater flow projections an expansion will be required by 2025. The proposed plant would increase the total capacity of the collection system to 5.10 MGD which is projected to provide average day capacity to 2040.					
Opinion of Probable Construction Cost					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	3.1 MGD WWTP	1	EA	\$ 37,200,000	\$ 37,200,000
				SUBTOTAL:	\$ 37,200,000
				CONTINGENCY	30%
				SUBTOTAL:	\$ 48,360,000
				ENG/SURVEY	15%
				SUBTOTAL:	\$ 55,614,000
Estimated Project Total In 2020 Dollars:					\$ 55,614,000
Construction Priority Number: C				Phase: 10 year	
Project Name:		Proj. #17 New 4.0 MGD Abbott Road Lift Station			
Project Description:					
This project includes a new Abbott Road lift station with a firm capacity of 4.00 MGD and the decommissioning of the existing 0.50 MGD lift station. Combining the proposed firm capacity of 4.00 MGD and the currently under design Abbott Road lift station capacity of 1.10 MGD, results in a total firm capacity of 5.10 MGD, which provides sufficient capacity through 2040-planning period. The new lift station will have a wet well sized for buildout flow projections for the proposed expansion in the buildout planning period. The rectangular wet well for this structure is sized to 22-feet deep with a wet well length and width of 18-feet. The new lift station will initially utilize three pumps total with two as duty pumps, expanding to six pumps at buildout. This project will be required once the number of active connections upstream of the Abbott Road lift station exceeds 1,900 EDUs.					
Project Drivers:					
The purpose of this project is to provide increased pumping capacity to serve flow generated by development in Basin Two through the 20-year planning period. This project will be required once the number of active connections upstream of the Abbott Road lift station exceeds 1,900 EDUs.					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	4 MGD Lift Station	1	EA	\$ 4,000,000	\$ 4,000,000
2	Lift Station - Decomm	1	LS	\$ 100,000	\$ 100,000
				SUBTOTAL:	\$ 4,100,000
				CONTINGENCY	30%
				SUBTOTAL:	\$ 5,330,000
				ENG/SURVEY	15%
				SUBTOTAL:	\$ 6,129,500
Estimated Project Total In 2020 Dollars:					\$ 6,129,500

 San Antonio River Authority  FREEZE NICHOLS 					
Capital Improvement Cost Estimate					January, 2021
Construction Priority Number: D					Phase: 10 year
Project Name: Proj. #5 Basin Three 18-inch Wastewater Main					
Project Description:					
This project involves constructing an 18-inch sewer main extending northeast proposed 24-inch interceptor (project 29). The proposed 18-inch sewer main will provide capacity to convey future peak wet weather flows for the northeast portion of Basin Three.					
Project Drivers:					
This project will be required when development occurs near the existing development Laura Heights Estates, as the existing infrastructure in the area is near max capacity already. The purpose of this project is to extend wastewater service to residential development in the north-east portion of Basin Three.					
Opinion of Probable Construction Cost					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	18" Pipe > 16 feet deep	2,600	LF	\$ 240	\$ 624,000
2	18" Pipe 8- 16 feet deep	4,200	LF	\$ 220	\$ 924,000
3	60" Diameter Manhole	14	EA	\$ 12,000	\$ 168,000
4	Per Vertical Foot > 8', 60" Manhole	40	LF	\$ 850	\$ 34,000
				SUBTOTAL:	\$ 1,750,000
				CONTINGENCY	30%
				SUBTOTAL:	\$ 2,275,000
				ENG/SURVEY	15%
				SUBTOTAL:	\$ 2,616,300
Estimated Project Total In 2020 Dollars:					\$ 2,616,300
Construction Priority Number: E					Phase: 10 year
Project Name: Proj. #8 Basin Two 15/18/21/24/27-inch Wastewater Interceptor					
Project Description:					
The project consists of installing a new 15/18/21/24/27-inch wastewater interceptor upstream of Abbott Road lift station to Interstate 10 in the western portion of Basin Two. The proposed main will provide service to future customers west of the existing Abbott Road lift station. This project includes an 18-inch sewer main replacement of the existing 15-inch sewer main immediately upstream of the Abbott Road lift station.					
Project Drivers:					
The purpose of this project is to extend wastewater service to residential development in the west portion of Basin Two and commercial development south of Interstate 10 and east of Liberty Road. The 18-inch wastewater main connection will allow for buildout flows throughout Basin Two. As the existing 15-inch wastewater main in Basin Two is near capacity this project will be required when development occurs south of 1604 in Basin Two.					
Opinion of Probable Construction Cost					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	27" Pipe 8- 16 feet deep	1,200	LF	\$ 320	\$ 384,000
2	24" Pipe 8- 16 feet deep	2,600	LF	\$ 290	\$ 754,000
3	21" Pipe 8- 16 feet deep	3,800	LF	\$ 260	\$ 988,000
4	18" Pipe 8- 16 feet deep	2,450	LF	\$ 220	\$ 539,000
5	15" Pipe > 16 feet deep	800	LF	\$ 200	\$ 160,000
6	60" Diameter Manhole	18	EA	\$ 12,000	\$ 216,000
7	48" Diameter Manhole	2	EA	\$ 9,000	\$ 18,000
8	20" Boring and Casing	100	LF	\$ 350	\$ 35,000
9	18" Pipe 8- 16 feet deep	800	LF	\$ 220	\$ 176,000
10	Per Vertical Foot > 8', 48" Manhole	110	LF	\$ 600	\$ 66,000
11	15" Pipe 8- 16 feet deep	450	LF	\$ 180	\$ 81,000
				SUBTOTAL:	\$ 3,336,000
				CONTINGENCY	30%
				SUBTOTAL:	\$ 4,336,800
				ENG/SURVEY	15%
				SUBTOTAL:	\$ 4,987,400
Estimated Project Total In 2020 Dollars:					\$ 4,987,400

 San Antonio River Authority  FREEZE AND NICHOLS					
Capital Improvement Cost Estimate					January, 2021
Construction Priority Number: F					Phase: 10 year
Project Name: Proj. #9 Basin Three 10/12-inch Wastewater Main					
Project Description:					
This project involves a new 10/12-inch wastewater main along the creek extending the proposed 18-inch wastewater main (project 5) north of the Reserve at Schertz. This project will provide service to new customers in the northern portion of Basin Three.					
Project Drivers:					
This project extends wastewater service to the north east portion of Basin Three to serve residential development north and east of Laura Heights Estates. This project will be required when development occurs north of Laura Heights Estates as the existing infrastructure is near max capacity.					
Opinion of Probable Construction Cost					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	12" Pipe 8- 16 feet deep	3,300	LF	\$ 140	\$ 462,000
2	10" Pipe 8- 16 feet deep	2,400	LF	\$ 120	\$ 288,000
3	48" Diameter Manhole	12	EA	\$ 9,000	\$ 108,000
SUBTOTAL:					\$ 858,000
CONTINGENCY				30%	\$ 257,400
SUBTOTAL:					\$ 1,115,400
ENG/SURVEY				15%	\$ 167,400
SUBTOTAL:					\$ 1,282,800
Estimated Project Total In 2020 Dollars:					\$ 1,282,800
Construction Priority Number: G					Phase: 10 year
Project Name: Proj. #15 Basin Three 10/12-inch Wastewater Main					
Project Description:					
This project consists of construction a new 10/12-inch wastewater main starting at Interstate 10 and Pfeil Road to the proposed 33-inch interceptor (project 29) at Old Graytown road. This project will provide service to new customers downstream of the Millican Grove lift station.					
Project Drivers:					
This project will extend wastewater service to the eastern portion of Basin Three south of Interstate 10 and serve commercial and mixed use in that area.					
Opinion of Probable Construction Cost					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	12" Pipe 8- 16 feet deep	2,900	LF	\$ 140	\$ 406,000
2	10" Pipe 8- 16 feet deep	2,900	LF	\$ 120	\$ 348,000
3	20" Boring and Casing	100	LF	\$ 350	\$ 35,000
4	48" Diameter Manhole	11	EA	\$ 9,000	\$ 99,000
SUBTOTAL:					\$ 888,000
CONTINGENCY				30%	\$ 266,400
SUBTOTAL:					\$ 1,154,400
ENG/SURVEY				15%	\$ 173,200
SUBTOTAL:					\$ 1,327,600
Estimated Project Total In 2020 Dollars:					\$ 1,327,600

 San Antonio River Authority 					
Capital Improvement Cost Estimate					January, 2021
Construction Priority Number: H				Phase: 10 year	
Project Name: Proj. #11 Basin Four 15-inch Wastewater Main					
Project Description:					
This project consists of installing a 15-inch wastewater main from the west portion of Basin Four along Escondido Creek to the existing 15-inch wastewater main south of Interstate 10. This project will provide service to mixed use development in the southwestern portion of Basin Four, south of 1604.					
Project Drivers:					
The purpose of this project is to extend wastewater service to the along Interstate 10 to commercial and mixed use development between Green Road and Loop 1604.					
Opinion of Probable Construction Cost					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	15" Pipe 8- 16 feet deep	6,000	LF	\$ 180	\$ 1,080,000
2	48" Diameter Manhole	12	EA	\$ 9,000	\$ 108,000
3	24" Boring and Casing	100	LF	\$ 420	\$ 42,000
SUBTOTAL:					\$ 1,230,000
CONTINGENCY				30%	\$ 369,000
SUBTOTAL:					\$ 1,599,000
ENG/SURVEY				15%	\$ 239,900
SUBTOTAL:					\$ 1,838,900
Estimated Project Total In 2020 Dollars:					\$ 1,838,900
Construction Priority Number: I					Phase: 10 year
Project Name: Proj. #16 Basin Four 12/15-inch Wastewater Main					
Project Description:					
This project consists of installing a new 12/15-inch wastewater main along Green Road to the existing 18-inch wastewater main at Loop 1604. This project will provide service to mixed use development in the southeastern portion of Basin Four, west of 1604.					
Project Drivers:					
The purpose of this project is to extend wastewater service to mixed use development along Green Road, west of Loop 1604.					
Opinion of Probable Construction Cost					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	15" Pipe 8- 16 feet deep	2,600	LF	\$ 180	\$ 468,000
2	12" Pipe 8- 16 feet deep	1,400	LF	\$ 140	\$ 196,000
3	30" Boring and Casing	60	LF	\$ 525	\$ 31,500
4	48" Diameter Manhole	8	EA	\$ 9,000	\$ 72,000
SUBTOTAL:					\$ 767,500
CONTINGENCY				30%	\$ 230,300
SUBTOTAL:					\$ 997,800
ENG/SURVEY				15%	\$ 149,700
SUBTOTAL:					\$ 1,147,500
Estimated Project Total In 2020 Dollars:					\$ 1,147,500

 San Antonio River Authority 					
Capital Improvement Cost Estimate				January, 2021	
Construction Priority Number: J				Phase: 10 year	
Project Name:		Proj. #22 Basin Six 12/15-inch Wastewater Main and 18/21/24/27/30-inch Wastewater Interceptor			
Project Description:					
This project includes constructing both a 12/15-inch wastewater main and an 18/21/24/27/30-inch wastewater interceptor along Martinez Creek to the currently under design Schuwirth Road lift station (project 21). This project will provide service to new customers in Basin Six upstream of the proposed Schuwirth Road lift station.					
Project Drivers:					
The purpose of this project is to convey flow to the proposed Schuwirth Road lift station and extend wastewater service to residential development in Basin Six. This project will be required when development occurs in Basin Six.					
Opinion of Probable Construction Cost					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	30" Pipe 8- 16 feet deep	3,050	LF	\$ 360	\$ 1,098,000
2	27" Pipe 8- 16 feet deep	750	LF	\$ 320	\$ 240,000
3	24" Pipe 8- 16 feet deep	950	LF	\$ 290	\$ 275,500
4	21" Pipe > 16 feet deep	1,400	LF	\$ 280	\$ 392,000
5	18" Pipe 8- 16 feet deep	1,600	LF	\$ 220	\$ 352,000
6	15" Pipe 8- 16 feet deep	1,400	LF	\$ 180	\$ 252,000
7	12" Pipe 8- 16 feet deep	1,100	LF	\$ 140	\$ 154,000
8	60" Diameter Manhole	18	EA	\$ 12,000	\$ 216,000
9	48" Diameter Manhole	5	EA	\$ 9,000	\$ 45,000
10	30" Boring and Casing	50	LF	\$ 525	\$ 26,250
				SUBTOTAL:	\$ 3,050,800
				CONTINGENCY	30%
				SUBTOTAL:	\$ 3,966,100
				ENG/SURVEY	15%
				SUBTOTAL:	\$ 4,561,100
				Estimated Project Total In 2020 Dollars: \$ 4,561,100	
Construction Priority Number: K				Phase: 10 year	
Project Name:		Proj. #32 Basin Six 10/12-inch Wastewater Main			
Project Description:					
The project consists of constructing a 10/12/15-inch wastewater main from the northern portion of Basin Six to the proposed 24-inch wastewater main (project 22) at Schuwirth Road. This project will provide new service for customers in the northern portion of Basin Six.					
Project Drivers:					
The purpose of this project is to extend wastewater service to residential development as it occurs in the northern portion of Basin Six.					
Opinion of Probable Construction Cost					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	15" Pipe 8- 16 feet deep	2,200	LF	\$ 180	\$ 396,000
2	12" Pipe 8- 16 feet deep	1,000	LF	\$ 140	\$ 140,000
3	10" Pipe 8- 16 feet deep	2,900	LF	\$ 120	\$ 348,000
4	48" Diameter Manhole	13	EA	\$ 9,000	\$ 117,000
				SUBTOTAL:	\$ 1,001,000
				CONTINGENCY	30%
				SUBTOTAL:	\$ 1,301,300
				ENG/SURVEY	15%
				SUBTOTAL:	\$ 1,496,500
				Estimated Project Total In 2020 Dollars: \$ 1,496,500	