

**Town of Marana  
Impact Fee Study**

**Wastewater Facilities  
Infrastructure Improvements Plan**

**Public Report  
FINAL**

**As approved by the Marana Town Council, September 20, 2022**

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Prepared for



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September 20, 2022



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# 1 Introduction

As of July 2021, the Town of Marana Water Department (Marana Water) owns and operates a sewer collection system that currently serves approximately 5,200 sewer connections and conveys approximately 695,000 gallons per day (gpd) of sewage to the Marana Water Reclamation Facility (WRF). The Town of Marana (Town) is expected to grow rapidly in the upcoming years with an anticipated additional 10,362 new sewer connections in the next 10 years.

Arizona Revised Statutes (ARS) §9-463.05 require that Development Impact Fees be based on adopted land use assumptions and an adopted Infrastructure Improvements Plan (IIP). To support the Town in meeting these requirements, Marana Water contracted with HDR to update the Town's IIP which details the Town's existing sewer collection and treatment infrastructure, available capacity, units of demand, and planning for new infrastructure required to serve future proposed development.

The purpose of this IIP update is to summarize the capital improvements required for the Town to meet the demands associated with the next 10 years of growth and to provide the estimated costs of the improvements.

# 2 Existing Sewer Collection and Treatment Facilities

The Marana collection system has approximately 84.3 miles of gravity mains ranging in size from 8-inch to 24-inch diameter. In addition to gravity pipe, the collection system also has approximately 1,729 manholes and 1.7 miles of 8-inch diameter force main.

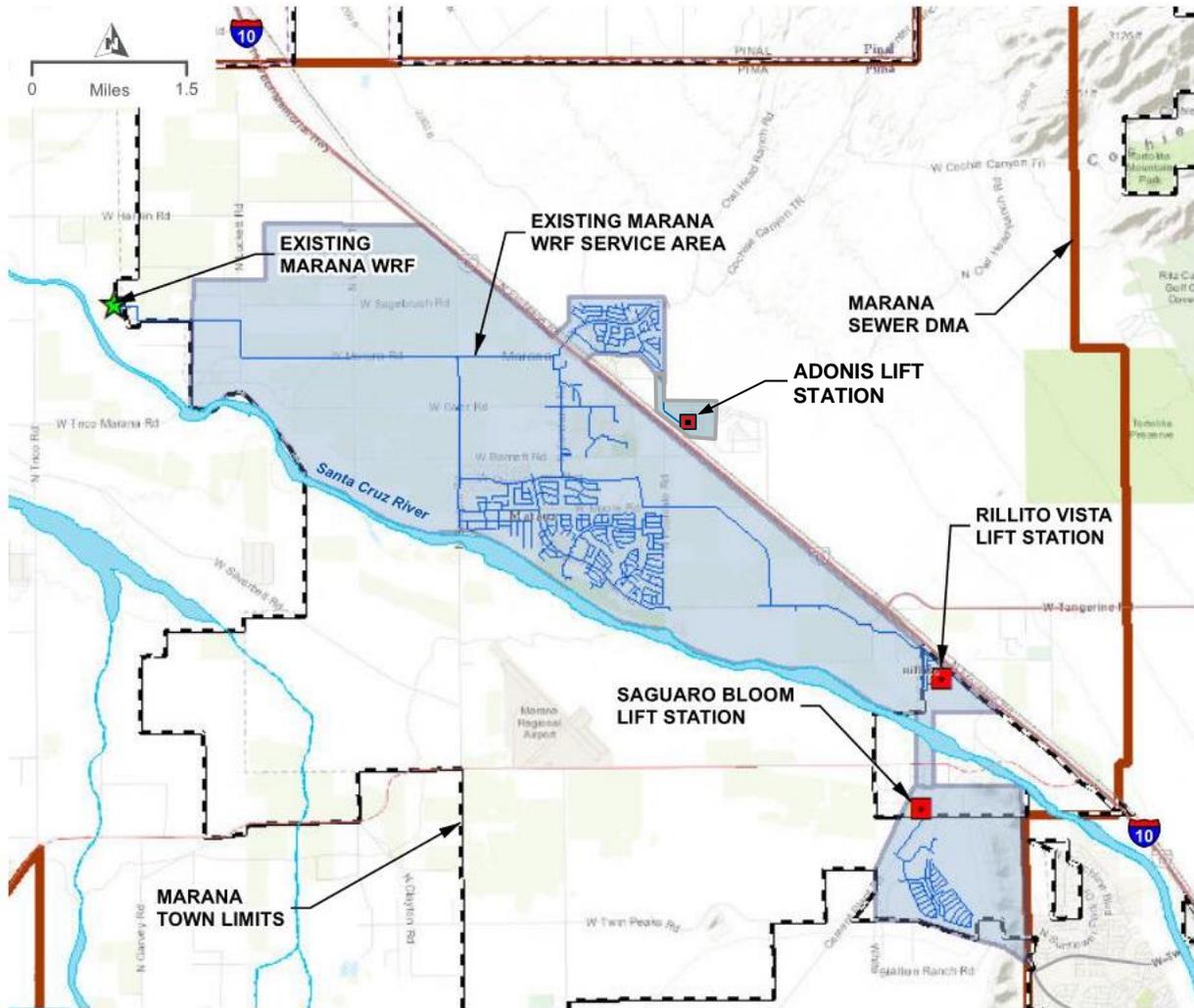
Marana Water operates multiple lift stations including the Rillito Vista Lift Station (LS) and the Saguaro Bloom LS. The Rillito Vista LS serves the Rillito Vista development and the Saguaro Bloom LS serves the active service area south of the Santa Cruz River. Marana Water also recently purchased the Adonis Sewer System and has constructed a new lift station and forcemain to provide service for this area. There are 153 active sewer connections in Adonis. The average daily flow is approximately 18,000 gallons per day (gpd).

Marana Water operates the Marana Water Reclamation Facility (WRF) which has a current treatment capacity of 1.5 million gallons per day (MGD) and treats the wastewater collected within the Marana sewer system service area. Through expansion the existing Marana WRF can provide a future treatment capacity of up to 4.5 MGD.

Marana Water also operates the Airport Sewer System which is a small standalone system consisting of approximately 5,000 linear feet (LF) of collection lines, 12 manholes and a septic tank / leach field disposal system rated for a treatment capacity of 19,000 gpd. There are currently no active connections to the Airport Sewer System.



Figure 3-2. Active Sewer Service Area



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MARANA COLLECTION SYSTEM MASTER PLAN

## 4 Level of Service

The Town provides sewer collection and treatment for customers within the active sewer service area. The level of service can be defined by the design criteria established by the Town for these systems.

The sewer mains in the collection system are designed to convey the peak wet-weather flow (PWWF). Sewer mains are considered to have adequate capacity if they're able to convey the PWWF with the pipes flowing at depth to diameter (d/D) ratio of 75% or less and without any surcharging.

The Marana WRF is designed to treat the average dry-weather flow (ADWF) for the system and the facility is designed to produce Class A+ reclaimed water as defined by the Arizona Department of Environmental Quality (ADEQ). The treated effluent can be reused, recharged, or discharged to a tributary of the Santa Cruz River.

The level of service provided is the same for both existing and future customers within the active sewer service area.

## 5 Projected 10-Year Land Use

HDR completed the Sewer Conveyance Master Plan in June 2020 based on future development projections available at that time. Following the completion of the Sewer Conveyance Master Plan the Town has continued to update the projections for the future growth areas, so a revised summary of the commercial and residential developments within the DMA for the 10-year planning horizon associated with this IIP update was provided. The future growth areas for the Town are shown in Figure 5-1, and the estimated additional DUs to be added to the active sewer service area through Year 2032 are summarized in Table 5-1.





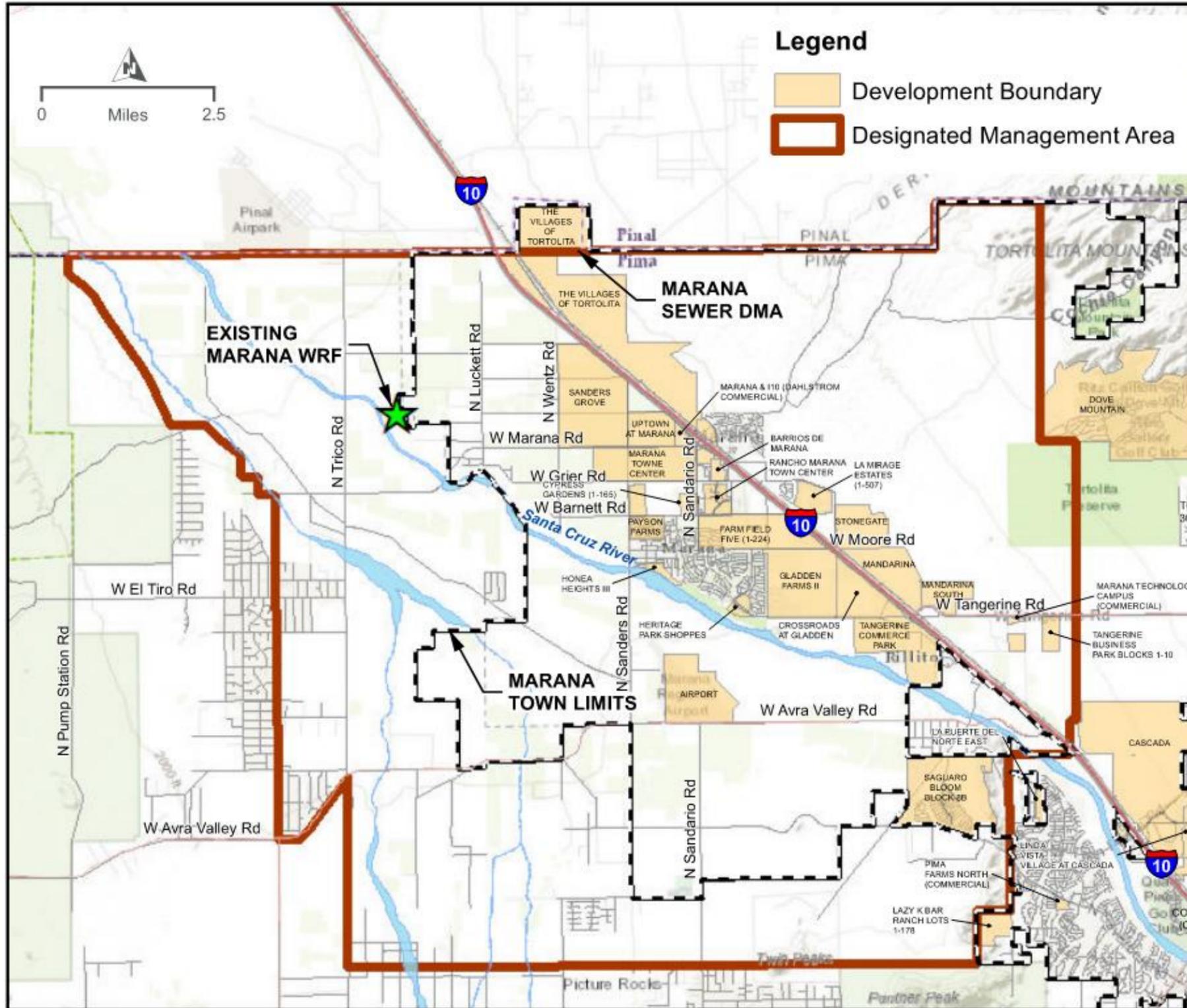
**Table 5-1. Future Developments and Estimated DU's**

Development	Buildout DUs <sup>a,b</sup>	Existing DUs	Projected DUs from Jul 2021 – Nov 2022	Additional DUs to be Assigned	Year 2023 – 2027	Year 2028 – 2032	Year 2033+
Mandarina	2,544	-	-	2,544	532	810	1,202
Mandarina South	830	-	-	830	40	150	640
Stonegate	3,138	-	-	3,138	300	700	2,138
Villages of Tortolita	6,500	-	-	6,500	-	300	6,200
<b>Subtotal East of I-10</b>	<b>13,012</b>	<b>0</b>	<b>0</b>	<b>13,012</b>	<b>872</b>	<b>1,960</b>	<b>10,180</b>
Crossroads at Gladden	672	-	-	672	160	328	184
Cypress Gardens	217	-	-	217	100	117	-
Gladden Farms II	2,539	599	351	1,589	1,421	-	168
Gladden Farms Commercial	88	-	-	88	-	-	88
Heritage Park Shoppes	72	-	-	72	16	20	36
Marana & I-10	148	-	-	148	12	100	36
Marana Main Street	80	-	-	80	16	24	40
Marana Towne Center	4,048	-	-	4,048	40	80	3,928
Payson Farms	457	-	-	457	457	-	-
Rancho Marana – West	536	307	59	170	150	4	16
Rancho Marana Town Center	164	-	-	164	-	20	144
Saguaro Bloom	2,509	1,245	564	700	700	-	-
Sanders Grove	2,500	-	-	2,500	100	600	1,800
Tangerine Commerce Park	188	-	-	188	60	60	68
Uptown at Marana	930	-	-	930	-	300	630
Vanderbilt Farms	1,945	224	-	1,721	500	1,000	221
Villages of Barnett	251	-	81	170	50	-	120
<b>Subtotal West of I-10</b>	<b>17,344</b>	<b>2,375</b>	<b>1,055</b>	<b>13,914</b>	<b>3,782</b>	<b>2,653</b>	<b>7,479</b>
Airport	200	-	-	200	20	20	160
<b>Subtotal Airport</b>	<b>200</b>	<b>0</b>	<b>0</b>	<b>200</b>	<b>20</b>	<b>20</b>	<b>160</b>
<b>Total</b>	<b>30,556</b>	<b>2,375</b>	<b>1,055</b>	<b>27,126</b>	<b>4,674</b>	<b>4,633</b>	<b>17,819</b>

<sup>a</sup> Buildout is only within the service areas of the existing WRF and proposed WRF east of I-10

<sup>b</sup> Includes commercial developments with assumed density of 4 DUs per acre.

Figure 5-1. Development Activity



## 6 Existing System Capacity

This section provides an analysis of the existing system capacity as well as the current level of usage and commitments for usage of capacity for the existing wastewater collection and treatment systems.

### 6.1 Unit Wastewater Flow Rates

The initial step in evaluating the system capacity is establishing the estimated unit wastewater generation rate for the existing sewer collection and treatment system and an equivalency establishing the ratio of a service unit to the various types of land uses (i.e., residential, commercial and industrial, etc.) within the service area.

As part of the Sewer Conveyance Master Plan, HDR developed unit wastewater flow rates for each customer type based on a review of manhole flow monitoring data as well as applicable design and construction criteria contained in the Pima County Regional Wastewater Reclamation Department Engineering Design Standards and the Arizona Administrative Code (AAC).

The following provides a summary of the recommended parameters from the Sewer Conveyance Master Plan.

#### **Gravity Conveyance System:**

- Residential unit flow = 216 gpd/DU<sup>1</sup>
- Commercial unit flow rate = 1,466 gpd per connection
- PWWF = 499.5 gpd/DU<sup>2</sup>

#### **Forcemains and Lift Stations:**

- Lift stations should be capable of operating at minimum flows and maximum flows:
  - PWWF = 499.5 gpd/DU

#### **Treatment Capacity:**

- Average Dry Weather Flow (ADWF)\*\* at 127.6 gal/DU. However, based on the last six months (September 2021 – February 2022) of influent data to the Marana

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<sup>1</sup> From Pima County Engineering Design Standards, i.e., 2.7 residents per DU x 80 gallons per capita per day

<sup>2</sup> Per AAC R18-9-E301(D)(b)(i) for estimated population of 9,500 in sewer collection area, the Peak Dry Weather Peaking Factor is 1.85. This is multiplied against the PWWF peaking factor of 1.25, for a combined peaking factor of 2.31. Note that PWWF peaking factors are not specified in the AAC, Pima County Engineering Design Standards, or in ADEQ Bulletin 11. Recent developer estimates have used a PWWF peaking factor of 25% above PDWF. For the purposes of this IIP, 25% above PDWF was assumed.

WRF and most recent count of residential customer connections this, the ADWF for future forecasting has been revised to 139.6 gal/DU<sup>3</sup>.

\*\* Note that per ADEQ Bulletin 11 – Minimum Requirements for Design, Submission of Plans and Specifications for Sewage Works and AAC R18-9-B202(A)(9)(a), the design of treatment works should be based on the annual average rate which is based on actual flow rates.

## 6.2 Existing Treatment System – Required Capacity

A summary of the existing influents flows and available treatment capacity for the Marana WRF is provided in Table 6-1. Influent flows to the Marana WRF have steadily been increasing over the last year, increasing from approximately 550,000 gallons per day (gpd) to over 695,000 gpd as experienced in May 2021 which used as the baseline flow for this report noting that the Town’s future development projections are based on a July 2021 starting point.

In anticipation of future growth, the existing Marana WRF recently underwent an expansion from 0.5 MGD to 1.5 MGD. With further expansion the build-out capacity of the Marana WRF is 4.5 MGD.

Based on the existing flows and available treatment capacity, the treatment system has approximately 805,000 gpd of excess capacity to support additional future growth.

**Table 6-1. Marana WRF – Existing Wastewater Flows and Available Capacity**

Location	Existing Wastewater Flow (gpd) as of July 2021
East of I-10	119,561 <sup>a</sup>
West of I-10	575,439 <sup>b</sup>
<b>Total Existing Wastewater Flow (gpd)</b>	<b>695,000<sup>c</sup></b>
<b>Marana WRF Treatment Capacity (gpd)</b>	<b>1,500,000</b>
<b>Excess Treatment Capacity Available (gpd)</b>	<b>805,000</b>

<sup>a</sup> Estimated based on 784 DUs in San Lucas and 153 DUs in Adonis at ADWF of 127.6 gal/DU

<sup>b</sup> Estimated as difference between Marana WRF flows minus flows from east of I-10

<sup>c</sup> Based on average influent flows to the Marana WRF in May 2021, as reported by the Town

## 6.3 Existing Sewer Collection System - Required Capacity

The sewer collection system tributary to the Marana WRF is served by 12 main sewer interceptors that have been labeled A through L. Each interceptor is divided into segments that consist of one or more pipes. For the purposes of evaluating the existing sewer collection system capacity as required for the IIP, the interceptors were broken up into segments based on where wastewater loads are allocated to the system.

The sewer capacity tables are provided in Appendix A. Table A-1 shows the calculated PWWF, the resulting depth to diameter (d/D) ratio for the PWWF, the existing pipe

<sup>3</sup> ADWF estimated based on highest average monthly flow (792,000 gal/day in January 2022) and residential customer count of 5,672.

capacity, and the excess pipe capacity available for each interceptor segment. The existing capacity is based on the pipe flowing at 100% full. Excess capacity was determined as the difference between the existing PWWF and existing capacity of the pipe. As shown in the table, all pipes have sufficient capacity to convey the existing wastewater flows and have significant excess capacity available for future growth. However, there are multiple segments in Branches D, J, and K which are at or above 50% capacity and are expected to exceed a d/D ratio above 75% in the coming five years. For the purposes of this analysis, HDR identified pipes with d/D ratios of above 0.70 as potentially requiring capacity improvements. See Appendix B, Figure B-1 for the existing sewer capacity.

## 7 Projected Capacity Requirements

This section provides a summary of the number of projected service units and the projected wastewater loads necessitated by and attributable to new development in the active sewer service area for the period encompassing the next ten years (i.e., 2023 to 2032). The projected capacity requirements for the 10-year projected growth are also compared with the utilization and available capacity of the existing treatment and sewer collection system infrastructure.

### 7.1 Treatment Capacity Requirements

Table 7-1 provides a summary of the projected flows from future growth for the period between 2023 to 2027 (5 Year) and 2028 to 2032 (10 Year). The Airport Sewer System has a standalone treatment system and will not be conveyed to the Marana WRF. Table 7-2 provides a summary of the existing wastewater flows, additional flows associated with future growth and a comparison with available treatment capacity at the Marana WRF.

As shown in Table 7-2, the Marana WRF is projected to receive an additional ADWF of 796,977 gpd by the end of 2027 and 1,440,952 gpd by the end of 2032.

- The total expected ADWF at the Marana WRF in November 2027 will be 1.49 MGD as compared to the available capacity of 1.5 MGD, which represents approximately 99% of total capacity.
- The total expected ADWRF at the Marana WRF in November 2032 will be 2.14 MGD as compared to the available capacity of 1.5 MGD, which represents approximately 143% of capacity.

In anticipation of future growth, the existing Marana WRF recently underwent an expansion from 0.5 MGD to 1.5 MGD and with further expansion the build-out capacity of the Marana WRF is 4.5 MGD. The additional flows through Year 2027 take the Marana WRF approximately to its rated capacity, and additional flows through Year 2032 are beyond the Marana WRF current capacity. Design of the expansion of the Marana WRF should begin when ADWF exceeds 75% of capacity, which is expected to occur by early-2025. The expansion phasing for the existing WRF is shown in Figure 7-1, with flows

after 2032 based on projections summarized in Table 6-1 and construction of a new WRF east of I-10 as identified in the 2020 Sewer Master Plan<sup>4</sup>.

**Table 7-1. Marana WRF – Future Estimated DU’s and Influent Wastewater Flows**

Development	Existing DUs	Projected DUs from Jul 2021 – Nov 2022	Total DUs to be Assigned 2023 – 2032	Year 2023 - 2027		Year 2028 - 2032	
				Additional DUs	Additional ADWF (gpd) <sup>b</sup>	Additional DUs	Additional ADWF (gpd) <sup>b</sup>
Mandarina	-	-	1,342	532	74,267	810	113,076
Mandarina South	-	-	190	40	5,584	150	20,940
Stonegate	-	-	1,000	300	41,880	700	97,720
Villages of Tortolita	-	-	300	-	-	300	41,880
<b>Subtotal East of I-10</b>	<b>0</b>	<b>0</b>	<b>2,832</b>	<b>872</b>	<b>121,731</b>	<b>1,960</b>	<b>273,616</b>
Crossroads at Gladden	-	-	488	160	22,336	328	45,789
Cypress Gardens	-	-	217	100	13,960	117	16,333
Gladden Farms II	599	351	1,421	1,421	198,372	-	-
Gladden Farms Commercial	-	-	-	-	-	-	-
Heritage Park Shoppes	-	-	36	16	2,234	20	2,792
Marana & I-10	-	-	112	12	1,675	100	13,960
Marana Main Street	-	-	40	16	2,234	24	3,350
Marana Towne Center	-	-	120	40	5,584	80	11,168
Payson Farms	-	-	457	457	63,797	-	-
Rancho Marana – West	307	59	154	150	20,940	4	558
Rancho Marana Town Center	-	-	20	-	-	20	2,792
Saguaro Bloom	1,245	564	700	700	97,720	-	-
Sanders Grove	-	-	700	100	13,960	600	83,760
Tangerine Commerce Park	-	-	120	60	8,376	60	8,376
Uptown at Marana	-	-	300	-	-	300	41,880
Vanderbilt Farms	224	-	1,500	500	69,800	1,000	139,600
Villages of Barnett	-	81	50	50	6,980	-	-
<b>Subtotal West of I-10</b>	<b>2,375</b>	<b>1,055</b>	<b>6,435</b>	<b>3,782</b>	<b>527,967</b>	<b>2,653</b>	<b>370,359</b>
<b>Total</b>	<b>2,375</b>	<b>1,055</b>	<b>9,267</b>	<b>4,654</b>	<b>649,698</b>	<b>4,613</b>	<b>643,975</b>
Airport Sewer System <sup>a</sup>	-	-	40	20	2,792	20	2,792
<b>Subtotal Airport Sewer System</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>20</b>	<b>2,792</b>	<b>20</b>	<b>2,792</b>

<sup>a</sup> The Airport Sewer System has a standalone treatment system and will not be conveyed to the Marana WRF.

<sup>b</sup> Future ADWF projections based on 139.6 gal/DU

<sup>4</sup> The 2020 Master Plan recommends flows from Villages of Tortolita, Adonis, and San Lucas be diverted to a new WRF located east of I-10 by 2035, and that by 2050 flows from all developments east of I-10 be diverted to the new WRF. High and low projections reflect a range of future residential housing density between 0.5 to 2 DUs per acre within 3,600 acres located west of I-10.



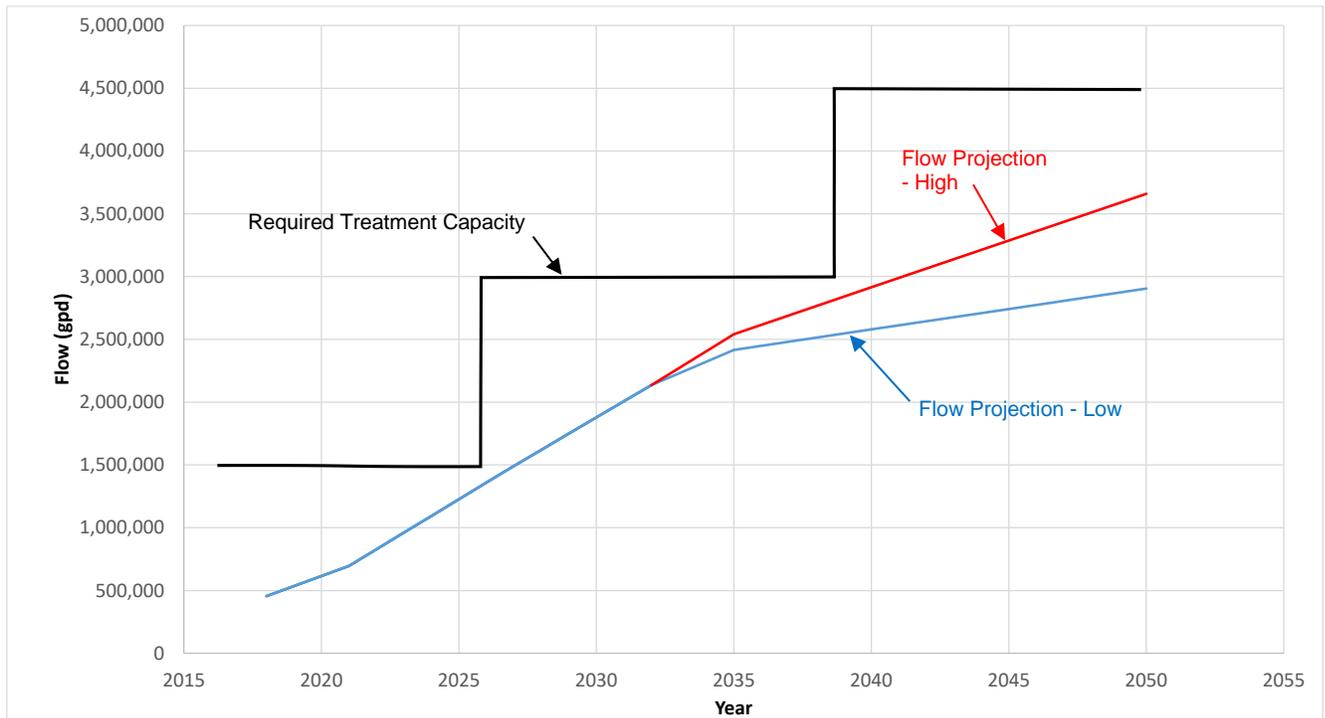
**Table 7-2. Marana WRF – Treatment Capacity Summary**

Period	Existing & Projected Wastewater Flow (gpd)	Additional ADWF (gpd) <sup>b</sup>		Total Wastewater Flow (gpd)	Available Treatment Capacity (gpd)	Excess Treatment Capacity Available (gpd)
		East of I-10	West of I-10			
Jul 2021 – Nov 2022	695,000	0	147,278 <sup>a</sup>	842,278	1,500,000	657,722
2023-2027 (5 Year)	842,278	121,731	527,967	1,491,976	1,500,000	8,024
2028-2032 (10 Year)	1,491,976	273,616	370,359	2,135,951	1,500,000	(635,951)

<sup>a</sup> Includes Gladden Farms II – 351 DUs, Rancho Marana West – 59 DUs, Saguaro Bloom – 564 DUs, Villages of Barnett – 81 DUs for a total of 1,055 DUs as shown in Table 7-1. When multiplied by ADWF projection of 139.6 gal/DU, the total projected flow for these developments is 139,042 gpd.

<sup>b</sup> ADWF projections based on 139.6 gal/DU

**Figure 7-1. Phased Expansion of the Existing WRF**



## 7.2 Sewer Collection System Capacity Requirements

Pipe capacity tables for future scenarios are shown in Appendix A and shows the capacity of the existing sewer collection system to accommodate the growth from 2023 to 2027 if no improvements were made. Appendix A shows the projected flow (i.e., PWWF), the resulting d/D ratio for the PWWF, the existing pipe capacity, and the excess pipe capacity available for each interceptor segment for the 2023 to 2027 and 2028 to 2032 planning periods, respectively.

For the 2023 – 2027 planning period, Appendix A shows that the pipe capacity is 1.00 for portions of Branches I, J, and K, indicating surcharged conditions if no improvements

were made. There are a three pipe segments in Branch D that are above 0.70 but are not exacerbated by future growth. Based on these results, 2023 - 2027 improvements were identified (see Section 8.1) to alleviate the surcharging in the identified pipe segments. For the 2023 to 2027 planning period, the proposed gravity sewer improvements result in no pipes experiencing a d/D ratio above 0.70, other than the segments in Branch D which are slightly above 0.70.

For the 2028 to 2032 planning period, Appendix A shows the pipe capacity is 1.00 for portions of Branches B and G, indicating surcharged conditions. There are some pipe segments in Branch B with d/D values between 0.70 and 0.75 but are not exacerbated by future growth and were not susceptible to surcharging, so no future improvements were identified. Based on these results, improvements were identified (see Section 8.2) to alleviate the surcharging in the identified pipe segments. For the 2028 to 2032 planning period, the proposed gravity sewer improvements result in a reduction of d/D ratio from 1.00 to approximately 0.70 – 0.77, with no surcharging occurring anywhere in the system.

Figures showing the location of the pipes with insufficient capacity are included in Appendix B.

## 8 Capital Improvements

The Town of Marana is expected to develop rapidly over the next 10-15 years, requiring significant investment in infrastructure. HDR has identified several sewer infrastructure capital improvements that will provide Marana Water sufficient conveyance and treatment capacity to accommodate the Town's anticipated growth through the Year 2030 and beyond. The capital improvements required to support the Town's anticipated future growth are described in the following sections.

### 8.1 2023 – 2027 (5 Year) Infrastructure Improvements

Based on the results of model analysis completed for the Sewer Conveyance Master Plan it was determined the existing sewer collection system has available capacity to convey current peak wet weather flows while maintaining pipes at less than 75% capacity and without surcharging. However, new developments are anticipated east of I-10 in the 10 Year planning period and there is currently no infrastructure in place to support sewer service to these areas. The infrastructure improvements required for the 2023 to 2027 (5 Year) planning phase include gravity lines, lift stations, and force mains that are associated with new infrastructure needed to support sewer service to these new developments and infrastructure needed to increase the capacity of the existing gravity network west of I-10. The existing WRF has insufficient capacity to accommodate the projected growth for the (5 Year) planning phase and will require expansion.

#### Adonis

There are currently 153 DUs in Adonis, with sewer flows collected at two sewage lagoons located northwest of the development. Marana Water has constructed a new lift station and forcemain to direct flows from Adonis to the San Lucas gravity system. With the addition of the Adonis flows to the gravity system, there is sufficient capacity



available in the gravity main that connects San Lucas to the collection system west of I-10 to accommodate an additional 600 DUs before it surcharges. Since the lift station and force main have already been constructed, the capital costs associated with Adonis are not included as part of the CIP.

#### Stonegate, Mandarinina, and Mandarinina South (Improvement 1) – Complete

The new lift station and forcemain serving Adonis was not sized to receive flows from Stonegate, Mandarinina, and Mandarinina South. Improvements will be required to support any future growth associated with Mandarinina and other southeast developments.

A new 15-inch gravity line was constructed by Mandarinina LLC to convey flows across I-10 and connect to the Town's existing gravity network west of I-10. The new 15-inch pipe was installed along West Moore Road and connects to the existing 18-inch north-south gravity sewer line at the intersection of West Moore Road and North Clark Farms Boulevard that connects to the existing gravity line from Saguaro Bloom. It is anticipated the new 15-inch gravity line was sized for ultimate buildout in conjunction with other improvements and will have capacity to serve up to 1,000 DUs associated with Mandarinina and other southeast developments.

The existing gravity network west of I-10 has sufficient capacity to accommodate up to 250 DUs from these southeast developments, in addition to the anticipated growth on the west side of I-10, before additional gravity conveyance capacity to the existing WRF is required.

#### Reducing Flows Along Sandario Road (Improvements 2 and 3)

Improvements 2 and 3 are associated with increasing the capacity of the existing gravity network west of I-10. These improvements will also reduce flows flowing north on Sandario Road and provide flow relief to Branch F (see Figure A-2) which would exceed its maximum design capacity without these improvements.

Approximately 4,600 linear feet of 21-inch gravity lines will be required to augment the existing gravity network. A new 21-inch line will tie into the stubbed out gravity line at Tangerine Farms Road at Clark Farms Road and will continue north to Barnett Road (Improvement 2). The 21-inch line will continue west on Barnett Road to Sanders Road and tie into the existing sewer line on Sanders Road (Improvement 3).

#### Gravity System Improvements Along Sanders Road and Marana Road (Improvements 4 – 7)

The model results in Table A-1 show that without improvements, future sewer flows along Sanders Road and Marana Road will cause the existing sewer interceptors to surcharge. Approximately 19,300 linear feet of new gravity lines will be required to augment the existing gravity network.

The Town requested HDR evaluate two options for augmenting the sewer line along Sanders Road:

- Option 1: Install a parallel 21-inch sewer line from Barnett Road to Marana Road to augment the existing 15-inch sewer line.

- Option 2: Replace the existing 15-inch sewer line from Barnett Road to Marana Road with a new 27-inch sewer line. This option would be beneficial to the Town in not having to maintain two parallel lines, and also because it would eliminate the need for the Town to rehabilitate the existing manholes on the 15-inch line which the Town projects will cost \$731,282.

HDR evaluated the 21-inch and 27-inch options on Sanders Road, which are presented in Tables 8-1 and 8-2, respectively. As shown on Table 8-2, the 27-inch consolidated line will be lower in cost with the added benefit of fewer manholes and less pipe for the Town to maintain. HDR recommends this as the preferred option.

For augmenting the existing sewer capacity along Marana Road west of Sanders Road, the 2020 Sewer Conveyance Master Plan proposed a 27-inch new gravity line run north to Sagebrush Road, and then turn west, tying into the 24-inch existing gravity line at Luckett Road.

The new 27-inch gravity lines on Sanders Road and Sagebrush Road (Improvements 4, 5, 6 and 7) are expected to be required by 2024. As indicated by the results of the existing capacity evaluation (see Table A-1), Branches K and L will surcharge by the end of the 2023 – 2027 (5 Year) planning phase without improvements being made. The improvements are shown on Figure 8-1.

#### Marana WRF Expansion (Improvement 8)

If all projected development within the 10 year planning period occurs, the influent to the existing Marana WRF is anticipated to reach 99% of the current capacity of 1.5 MGD by November 2027. As such it's recommended the WRF expansion to 3.0 MGD be completed before then.

The Town's approach is to begin designing and constructing a new phase of expansion for its treatment facilities when the influent flow reaches 75% of the capacity of the facility. Per the current flow projections, by early 2025 the influent flow to the WRF will reach 1.125 MGD which is 75.0% of the WRF capacity, the regulatory point for beginning design.

Construction of the WRF expansion should begin prior to reaching 90% of capacity, which is expected to occur by late 2026. The influent flows are expected to reach 1.5 MGD by late 2027 and, assuming two years for construction, construction of the WRF expansion would need to start in late 2025. HDR estimates a 12 – 18 month design period prior to construction and recommends starting design in mid-2024.

A summary of the required sewer system improvements with estimated construction costs are provided in Table 8-1. The improvements are shown on Figure 8-1 and are designated with an Improvement ID number.



**Table 8-1. 2023 – 2027 (5 Year) Capital Improvement Summary, with Parallel 15-inch and 21-inch Lines on Sanders Rd (Improvement 5)**

Improvement ID	Infrastructure Component		Construction Cost <sup>a</sup>
1	Gravity Pipe	15-inch x 3,334 LF	\$0 <sup>b</sup>
2	Gravity Pipe	21-inch x 800 LF	\$325,297 <sup>c</sup>
3	Gravity Pipe	21-inch x 3,600 LF	\$2,463,177
4	Gravity Pipe	21-inch <sup>e</sup> x 5,300 LF	\$3,613,417 <sup>d</sup>
5	Gravity Pipe	27-inch x 2,800 LF	\$1,696,982
6	Gravity Pipe	27-inch x 5,300 LF	\$3,034,513
7	Gravity Pipe	27-inch x 5,900 LF	\$3,371,261
8	Existing WRF Design and Construction	1.5 MGD	\$39,161,113
<b>TOTAL</b>			<b>\$53,665,760</b>

<sup>a</sup> These are total estimated project costs including direct construction costs, contingency, contractor fees, design fees, and other direct costs. Fully loaded costs for each improvement project are provided in Appendix C.

<sup>b</sup> See construction drawings for Town of Marana Public Sewer Improvement Plan Mandarin Offsite Sewer S-2020-007 / ENG2002-003. Project will be funded by developer, so costs are not included in the CIP.

<sup>c</sup> Construction cost of \$309,807 provided by Meritage Homes, escalated by 5% per the Town’s request.

<sup>d</sup> Cost of the 21-inch line does not include the \$731,282 maintenance cost associated with rehabilitating the existing 15-inch line.

<sup>e</sup> Flows along Sanders Road will be conveyed by a new 21-inch pipeline and parallel existing 15-inch pipeline.

**Table 8-2. 2023 – 2027 (5 Year) Capital Improvement Summary, with Consolidated 27-inch Line on Sanders Road (Improvement 5)**

Improvement ID	Infrastructure Component		Construction Cost <sup>a</sup>
1	Gravity Pipe	15-inch x 3,334 LF	\$0
2	Gravity Pipe	21-inch x 800 LF	\$325,297 <sup>b</sup>
3	Gravity Pipe	24-inch x 3,600 LF	\$2,745,062
4	Gravity Pipe	27-inch x 5,300 LF	\$3,066,315 <sup>c</sup>
5	Gravity Pipe	27-inch x 2,800 LF	\$1,696,982
6	Gravity Pipe	27-inch x 5,300 LF	\$3,034,513
7	Gravity Pipe	27-inch x 5,900 LF	\$3,371,261
8	Existing WRF Design and Construction	1.5 MGD	\$39,161,113
<b>TOTAL</b>			<b>\$53,075,246</b>

<sup>a</sup> These are total estimated project costs including direct construction costs, contingency, contractor fees, design fees, and other direct costs. Fully loaded costs for each improvement project are provided in Appendix C.

<sup>b</sup> Construction cost of \$309,807 provided by Meritage Homes, escalated by 5% per the Town’s request.

<sup>c</sup> The total cost of constructing Improvement 4 is \$4,443,935. The proportional flow from the existing 15-inch line that would be replaced by Improvement 4 represents approximately 31% of the total flow capacity. Therefore, on a capacity basis \$3,066,315 would be assigned to the 27-inch line and \$1,377,620 to the existing 15-inch line.



## 8.2 2028 – 2032 (10 Year) Infrastructure Improvements

The infrastructure improvements required for the 2023 to 2027 (5 Year) planning phase include gravity lines, lift stations, and force mains that are associated with new infrastructure needed to support sewer service to these new developments and infrastructure needed to increase the capacity of the existing gravity network west of I-10.

Based on the results of model analysis, new developments located southeast of I-10 (Stonegate, Mandarinina, Mandarinina South) will result in flows that are in excess of the available capacity, specifically along the 15-inch and 18-inch sewer main that serve Saguaro Bloom. Furthermore, new developments located northeast of I-10 (Villages of Tortolita) will need to be conveyed to the existing sewer lines serving the Adonis and San Lucas development. The combined additional flows from developments located east of I-10 will require a new parallel pipe from the terminus of Improvement 7 to the existing WRF. The expanded WRF (Improvement 8) will have sufficient capacity to accommodate the projected growth for 10 Year planning phase.

### New Parallel Gravity Main to Existing WRF (Improvement 9)

The existing 24-inch gravity main feeding the WRF will begin surcharging after developments both east and west of I-10 exceed 10,000 EDUs. This will require adding a new parallel 27-inch gravity line.

### New Parallel Gravity Main Along Saguaro Bloom Transmission Line (Improvement 10)

Per the 2020 Master Plan, sewer flows from developments southeast of I-10 (Stonegate, Mandarinina, Mandarinina South) were to be conveyed to a new WRF located northeast of I-10 after exceeding 1,000 EDUs. The revised development projections show that the southeast developments will exceed 2,500 EDUs by 2032. The existing 15-inch gravity line (see Improvement 1) has sufficient capacity to convey new development flows through 2032, but these flows will result in surcharging along the 15-inch and 18-inch gravity lines downstream of the 15-inch connection point. This will require adding a new parallel 15-inch gravity line.

### Villages of Tortolita (Improvement 11)

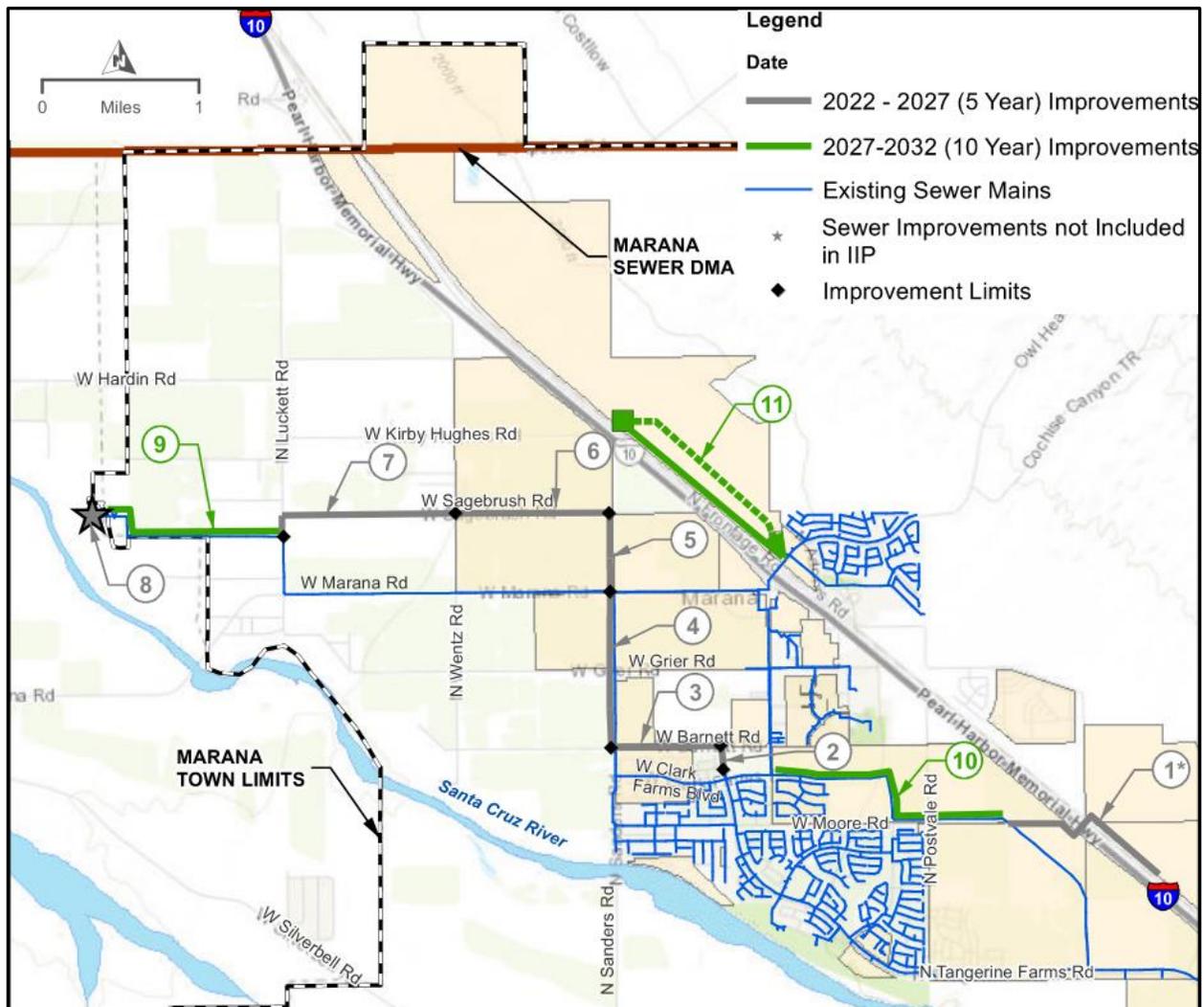
Initial growth is anticipated in the southern portion of the Villages of Tortolita. Sewer flows from the south will flow by gravity through an 18-inch line northwest towards a lift station and will be pumped back via a 6-inch force main to the existing gravity system serving San Lucas. The maximum size of the lift station is limited to serving approximately 600 EDUs from the Villages of Tortolita before surcharging the San Lucas and Adonis service line under I-10, or approximately 210 gpm pumping capacity. It should be noted the 18-inch gravity line is sized to accommodate ultimate buildout when flows from San Lucas, Adonis, and new developments to the southeast will be directed to the future WRF that will serve all developments on the east side of I-10.

**Table 8-3. 2028 – 2032 (10 Year) Capital Improvement Summary**

Improvement ID	Infrastructure Component	Size / Quality	Construction Cost <sup>1</sup>
9	Gravity Pipe	27-inch x 5,300 LF	\$3,034,513
10	Gravity Pipe	15-inch x 11,500 LF	\$5,809,844
11	Gravity Pipe Lift Station Force Main	18-inch x 6,800 LF 210 gpm capacity 6-inch x 6,800 LF	\$4,500,690
<b>TOTAL</b>			<b>\$13,345,048</b>

<sup>1</sup> These are total estimated project costs including direct construction costs, contingency, contractor fees, design fees, and other direct costs. Fully loaded costs for each improvement project are provided in Appendix C.

**Figure 8-2. 2028 – 2032 (10 Year) Capital Improvement Projects**



# Appendix A: Pipe Capacity Tables

## Appendix A

### Town of Marana Sewer Infrastructure Improvement Plan (IIP)

#### Sewer Pipe Capacity Tables

Interceptor Branch	Segment	Model ID	Diameter (in)	Length (ft)
A	1	193	12	186
A	2	194	12	296
A	3	964	12	558
A	4	85	12	285
A	5	84	12	64
A	6	83	12	282
A	7	82	12	88
A_NEW	1	5080	18	6,745
B	1	69296	15	49
B	2	90512	12	43
B	3	90513	12	205
B	4	90514	12	205
B	5	90515	12	240
B	6	90516	12	410
B	7	90517	12	410
B	8	90518	12	162
B	9	90519	12	163
B	10	90520	12	305
B	11	90521	12	283
B	12	90522	12	343
B	13	90523	12	63
B	14	90524	12	265
B	15	90525	12	84
B	16	90526	12	269
B	17	90527	12	264
B	18	90511	12	286
B	19	69295	15	487
B	20	69294	15	361
B	21	69293	15	173
B	22	69292	15	172
B	23	69291	15	400
B	24	69290	15	390
B	25	69289	15	251
B	26	69288	15	500
B	27	69287	15	500
B	28	69286	15	386
B	29	69285	15	391
B	30	69284	15	385
B	31	69283	15	95
B	32	69282	15	336
B	33	69281	15	315
B	34	69280	15	496
B	35	69279	15	258
B	36	69278	15	476
B	37	69277	15	475
B	38	69276	15	213
B	39	69275	18	304
B	40	69274	18	398
B	41	69273	18	600
B	42	69272	18	597
B	43	69271	18	446
B	44	69270	18	600
B	45	69269	18	409
B	46	69268	18	375
B	47	69267	18	291
B	48	69266	18	598
B	49	69265	18	601
B	50	69264	18	498
B	51	69262	18	500
B	52	69261	18	560
B	53	75260	18	600
B	54	75271	18	92
B	55	75270	18	279
B	56	75269	18	238
B	57	75268	18	273
B	58	75267	18	599
B	59	75266	18	66
B	60	75265	18	167
B	61	75264	18	346
B	62	75263	18	600
B	63	75262	18	600
B	64	75261	18	599
B	65	331	18	600
B	66	333	18	600
B	67	332	18	298

Existing System				
Existing Flow (MGD)	d/D	Existing Capacity (MGD)	Excess Capacity Available (MGD)	
0.33	0.29	1.80	1.47	
0.33	0.30	1.63	1.30	
0.33	0.29	1.74	1.41	
0.33	0.32	1.52	1.19	
0.33	0.31	1.58	1.25	
0.33	0.31	1.58	1.25	
0.33	0.30	1.63	1.30	
0.40	0.32	1.80	1.40	
0.40	0.40	1.16	0.76	
0.40	0.41	1.13	0.73	
0.40	0.41	1.13	0.73	
0.40	0.41	1.13	0.73	
0.40	0.41	1.13	0.73	
0.40	0.41	1.15	0.75	
0.40	0.40	1.19	0.79	
0.40	0.40	1.19	0.79	
0.40	0.40	1.18	0.78	
0.40	0.40	1.20	0.80	
0.40	0.40	1.19	0.79	
0.40	0.40	1.18	0.78	
0.40	0.40	1.19	0.79	
0.40	0.40	1.18	0.78	
0.40	0.40	1.19	0.79	
0.40	0.40	1.18	0.78	
0.40	0.29	2.16	1.76	
0.40	0.26	2.74	2.35	
0.40	0.26	2.61	2.21	
0.40	0.24	3.13	2.73	
0.40	0.30	2.01	1.61	
0.40	0.26	2.72	2.32	
0.41	0.27	2.55	2.14	
0.41	0.28	2.37	1.96	
0.41	0.28	2.37	1.96	
0.41	0.28	2.44	2.03	
0.41	0.28	2.33	1.92	
0.41	0.27	2.54	2.14	
0.41	0.21	4.16	3.75	
0.41	0.27	2.47	2.07	
0.41	0.28	2.37	1.97	
0.41	0.28	2.37	1.96	
0.41	0.28	2.44	2.03	
0.41	0.28	2.33	1.92	
0.41	0.27	2.54	2.14	
0.41	0.21	4.16	3.75	
0.41	0.27	2.47	2.07	
0.41	0.28	2.37	1.97	
0.41	0.28	2.37	1.96	
0.41	0.31	1.92	1.51	
0.41	0.31	2.00	1.60	
0.41	0.28	2.37	1.96	
0.41	0.25	2.90	2.49	
0.41	0.26	2.73	2.33	
0.41	0.25	2.98	2.57	
0.41	0.26	2.72	2.32	
0.41	0.25	3.04	2.63	
0.41	0.26	2.72	2.31	
0.41	0.25	2.97	2.56	
0.41	0.25	3.05	2.64	
0.41	0.24	3.26	2.86	
0.41	0.23	3.48	3.07	
0.41	0.25	2.97	2.57	
0.41	0.25	2.89	2.48	
0.41	0.26	2.81	2.41	
0.41	0.25	3.04	2.64	
0.41	0.25	3.02	2.61	
0.41	0.24	3.12	2.71	
0.41	0.25	2.93	2.52	
0.41	0.25	2.91	2.51	
0.41	0.25	2.93	2.52	
0.41	0.25	2.91	2.51	
0.41	0.25	2.92	2.51	
0.41	0.25	2.90	2.50	
0.41	0.25	2.93	2.52	
0.41	0.25	2.93	2.52	
0.41	0.25	2.92	2.51	
0.41	0.25	2.92	2.51	
0.41	0.25	2.92	2.51	
0.41	0.25	2.92	2.51	
0.41	0.25	2.92	2.51	
0.46	0.27	2.92	2.46	
0.46	0.27	2.93	2.47	

2022 to 2027 (5 Year) without Improvements				
Projected Flow (MGD)	d/D	Projected Capacity (MGD)	Excess Capacity Available (MGD)	
0.41	0.33	1.71	1.30	
0.41	0.34	1.63	1.22	
0.41	0.33	1.73	1.32	
0.41	0.35	1.52	1.11	
0.41	0.31	1.94	1.53	
0.41	0.35	1.56	1.16	
0.41	0.34	1.62	1.22	
0.94	0.53	1.72	0.78	
0.94	0.68	1.17	0.23	
0.94	0.69	1.14	0.20	
0.94	0.70	1.12	0.19	
0.94	0.69	1.14	0.20	
0.94	0.69	1.13	0.19	
0.94	0.69	1.15	0.21	
0.94	0.67	1.18	0.25	
0.98	0.70	1.19	0.20	
0.98	0.70	1.19	0.20	
0.98	0.69	1.19	0.20	
0.98	0.69	1.19	0.21	
0.98	0.70	1.18	0.20	
0.98	0.70	1.18	0.20	
0.98	0.70	1.18	0.19	
0.98	0.69	1.21	0.22	
0.98	0.70	1.18	0.20	
0.98	0.70	1.18	0.19	
0.98	0.47	2.16	1.17	
0.98	0.41	2.73	1.75	
0.98	0.43	2.61	1.63	
0.98	0.38	3.14	2.16	
1.18	0.55	2.00	0.83	
1.18	0.46	2.73	1.55	
1.18	0.48	2.55	1.37	
1.18	0.50	2.36	1.18	
1.18	0.50	2.38	1.20	
1.18	0.49	2.42	1.24	
1.18	0.50	2.33	1.15	
1.18	0.48	2.54	1.36	
1.18	0.37	4.10	2.91	
1.18	0.48	2.49	1.31	
1.18	0.50	2.34	1.16	
1.18	0.50	2.37	1.19	
1.18	0.57	1.92	0.74	
1.18	0.55	2.01	0.83	
1.18	0.50	2.36	1.18	
1.18	0.44	2.94	1.75	
1.18	0.46	2.71	1.53	
1.18	0.44	2.99	1.81	
1.18	0.46	2.72	1.54	
1.18	0.43	3.03	1.85	
1.18	0.46	2.71	1.53	
1.18	0.44	2.96	1.78	
1.18	0.43	3.06	1.88	
1.63	0.50	3.28	1.65	
1.63	0.48	3.47	1.84	
1.63	0.53	2.96	1.33	
1.63	0.54	2.90	1.27	
2.06	0.64	2.80	0.74	
2.29	0.65	3.04	0.75	
2.29	0.65	3.02	0.73	
2.29	0.64	3.11	0.82	
2.29	0.66	2.95	0.66	
2.29	0.67	2.91	0.61	
2.29	0.67	2.92	0.63	
2.29	0.67	2.92	0.62	
2.29	0.68	2.87	0.58	
2.29	0.66	2.99	0.69	
2.29	0.67	2.92	0.62	
2.29	0.67	2.92	0.62	
2.29	0.67	2.92	0.62	
2.29	0.67	2.91	0.62	
2.29	0.67	2.92	0.62	
2.29	0.68	2.86	0.56	
2.33	0.68	2.91	0.58	
2.33	0.68	2.88	0.55	

2022 to 2027 (5 Year) with Improvements				
Projected Flow (MGD)	d/D	Projected Capacity (MGD)	Excess Capacity Available (MGD)	
0.41	0.33	1.71	1.30	
0.41	0.34	1.63	1.22	
0.41	0.33	1.73	1.32	
0.41	0.35	1.52	1.11	
0.41	0.31	1.94	1.53	
0.41	0.35	1.56	1.16	
0.41	0.34	1.62	1.22	
0.94	0.53	1.72	0.78	
0.94	0.68	1.17	0.23	
0.94	0.69	1.14	0.20	
0.94	0.70	1.12	0.19	
0.94	0.69	1.14	0.20	
0.94	0.69	1.13	0.19	
0.94	0.69	1.15	0.21	
0.94	0.67	1.18	0.25	
0.98	0.70	1.19	0.20	
0.98	0.70	1.19	0.20	
0.98	0.69	1.19	0.20	
0.98	0.69	1.19	0.21	
0.98	0.70	1.18	0.20	
0.98	0.70	1.18	0.20	
0.98	0.70	1.18	0.19	
0.98	0.69	1.21	0.22	
0.98	0.70	1.18	0.20	
0.98	0.70	1.18	0.19	
0.98	0.47	2.16	1.17	
0.98	0.41	2.73	1.75	
0.98	0.43	2.61	1.63	
0.98	0.38	3.14	2.16	
1.18	0.55	2.00	0.83	
1.18	0.46	2.73	1.55	
1.18	0.48	2.55	1.37	
1.18	0.50	2.36	1.18	
1.18	0.50	2.38	1.20	
1.18	0.49	2.42	1.24	
1.18	0.50	2.33	1.15	
1.18	0.48	2.54	1.36	
1.18	0.37	4.10	2.91	
1.18	0.48	2.49	1.31	
1.18	0.50	2.34	1.16	
1.18	0.50	2.37	1.19	





## Appendix A

### Town of Marana Sewer Infrastructure Improvement Plan (IIP)

#### Sewer Pipe Capacity Tables

Interceptor Branch	Segment	Model ID	Diameter (in)	Length (ft)
E	1	287	12	85
E	2	403	12	500
E	3	402	12	500
E	4	409	12	500
E	5	408	12	500
E	6	407	12	500
E	7	406	12	500
E	8	405	12	487
E	9	404	12	39
E	10	4004	12	24
E	11	400	12	23
E	12	965	12	337
E	13	86	12	158
E	14	91	12	355
E	15	90	12	465
E	16	89	12	299
E	17	88	12	349
E	18	87	12	335
E	19	96	12	319
E	20	81	15	288
E	21	80	15	84
F	1	79	15	448
F	2	78	15	501
F	3	77	15	500
F	4	76	15	500
F	5	75	15	501
F	6	74	15	500
F	7	73	15	499
F	8	72	15	500
F	9	71	15	499
F	10	962	15	476
G	1	970	18	563
G	2	461	18	500
G	3	460	18	477
G	4	5064	18	80
G	1	459	18	57
G_NEW	2	5120	15	1,369
G_NEW	3	5122	15	516
H	1	978	15	499
H	2	458	15	387
H	3	457	15	394
H	4	456	21	337
H	5	484	12	48
I	1	499	12	349
I	2	498	12	211
I	3	487	15	273
I	4	497	15	400
I	5	496	15	164
I	6	495	15	380
I	7	494	15	406
I	8	493	15	171
I	9	492	15	219
I	10	491	15	500
I	11	490	15	500
I	12	489	15	131
I	13	488	15	40
I_NEW	1	500	21	77
I_NEW	2	455	21	318
I_NEW	3	5018	21	815
I_NEW	4	5014	21	2,028
I_NEW	5	5012	21	1,740
J	1	382	15	359
J	2	383	15	400
J	3	384	15	500
J	4	385	15	500
J	5	442	15	500
J	6	441	15	500
J	7	440	15	500
J	8	439	15	260
J	9	967	15	492
J	10	100	15	500
J	11	99	15	500
J	12	98	15	500
J	13	97	18	537
J	14	963	18	139
J	15	39	18	44

Existing System			
Existing Flow (MGD)	d/D	Existing Capacity (MGD)	Excess Capacity Available (MGD)
0.19	0.30	0.97	0.78
0.19	0.30	1.01	0.81
0.19	0.30	1.01	0.81
0.19	0.30	1.01	0.81
0.19	0.30	1.01	0.81
0.19	0.30	1.01	0.81
0.19	0.30	1.01	0.81
0.19	0.25	1.38	1.18
0.21	0.32	0.98	0.76
0.23	0.32	1.05	0.83
0.23	0.31	1.09	0.85
0.29	0.39	0.92	0.63
0.31	0.40	0.92	0.61
0.31	0.40	0.92	0.61
0.35	0.42	0.93	0.58
0.35	0.43	0.92	0.57
0.35	0.43	0.92	0.56
0.36	0.43	0.92	0.57
0.37	0.32	1.67	1.31
0.37	0.32	1.65	1.28
0.65	0.43	1.73	1.08
0.65	0.42	1.76	1.10
0.65	0.42	1.82	1.16
0.65	0.41	1.89	1.24
0.65	0.42	1.75	1.10
0.65	0.43	1.73	1.07
0.65	0.41	1.83	1.17
0.65	0.42	1.75	1.09
0.65	0.40	1.90	1.25
0.65	0.43	1.70	1.05
0.27	0.20	3.08	2.81
0.28	0.21	2.97	2.69
0.28	0.20	3.09	2.81
0.28	0.13	7.66	7.39
0.20	0.24	1.61	1.41
0.23	0.16	3.95	3.72
0.29	0.28	1.65	1.36
0.29	0.19	3.67	3.38
0.29	0.29	1.62	1.33
0.55	0.46	1.26	0.71
0.55	0.45	1.31	0.77
0.59	0.41	1.66	1.07
0.59	0.43	1.57	0.97
0.61	0.42	1.64	1.03
0.61	0.41	1.70	1.10
0.61	0.42	1.65	1.04
0.61	0.43	1.60	1.00
0.61	0.43	1.57	0.97
0.61	0.43	1.61	1.00
0.61	0.43	1.59	0.98
0.61	0.40	1.83	1.22
0.61	0.34	2.38	1.77
1.06	0.57	1.74	0.67
1.06	0.51	2.04	0.98
1.06	0.54	1.87	0.81
1.06	0.56	1.77	0.70
1.06	0.52	1.97	0.91
1.06	0.54	1.87	0.81
1.06	0.54	1.87	0.81
1.06	0.51	2.06	1.00
1.07	0.56	1.78	0.71
1.07	0.54	1.87	0.80
1.07	0.54	1.87	0.80
1.07	0.40	3.18	2.11
1.07	0.48	2.31	1.24
1.07	0.46	2.51	1.44

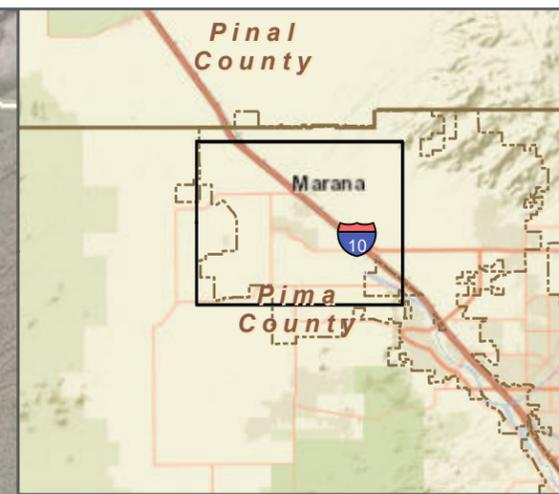
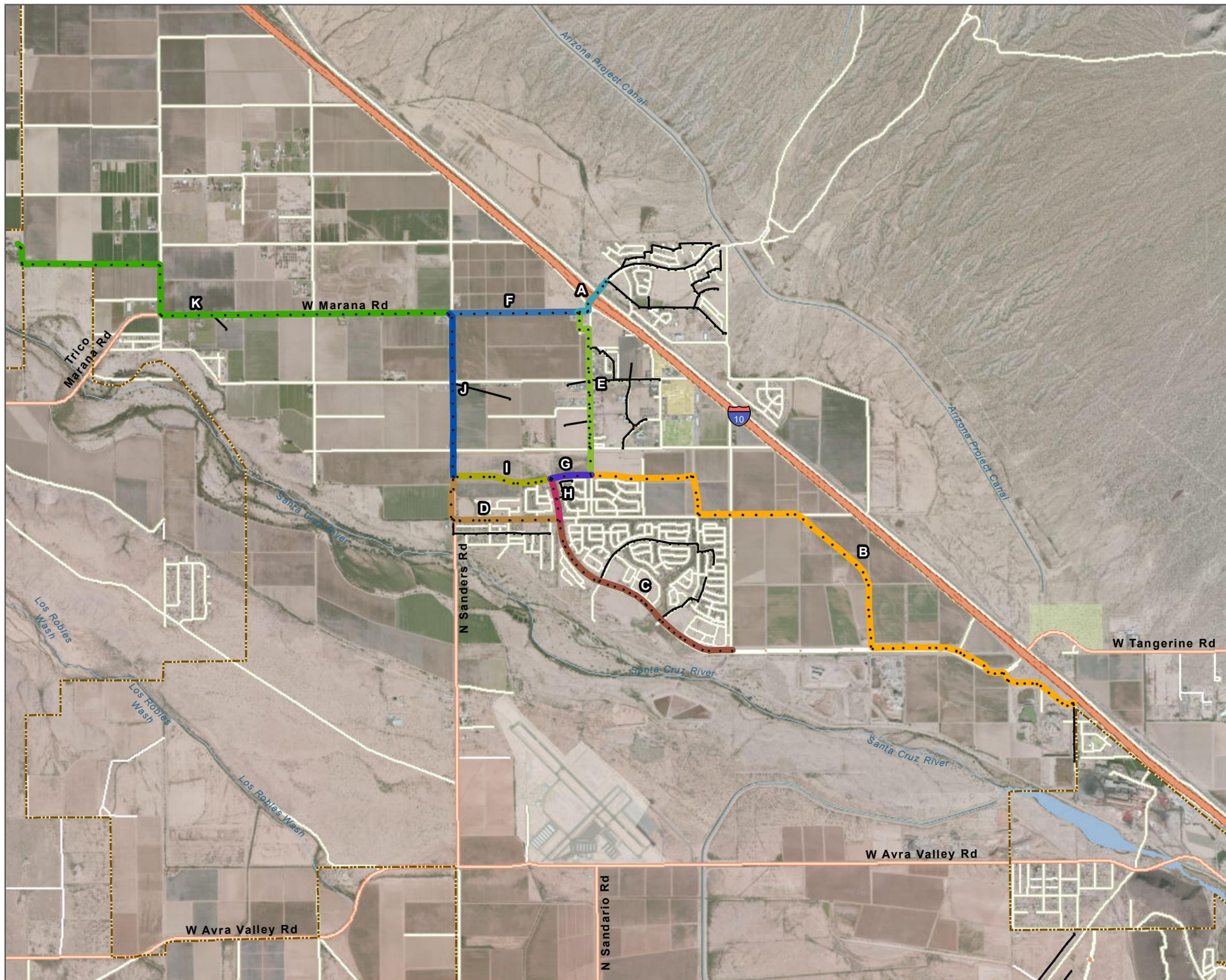
2022 to 2027 (5 Year) without Improvements			
Projected Flow (MGD)	d/D	Projected Capacity (MGD)	Excess Capacity Available (MGD)
0.47	0.45	1.11	0.64
0.52	0.51	1.01	0.49
0.52	0.51	1.01	0.49
0.52	0.51	1.01	0.49
0.52	0.51	1.01	0.49
0.52	0.51	1.01	0.49
0.57	0.54	1.01	0.43
0.57	0.54	1.01	0.43
0.57	0.45	1.38	0.80
0.58	0.56	0.98	0.40
0.60	0.45	1.41	0.81
0.60	0.53	1.08	0.48
0.65	0.62	0.93	0.28
0.66	0.63	0.92	0.25
0.66	0.63	0.92	0.25
0.66	0.63	0.92	0.26
0.70	0.66	0.92	0.21
0.72	0.66	0.94	0.22
0.72	0.67	0.92	0.20
0.73	0.68	0.91	0.18
0.74	0.46	1.71	0.97
0.74	0.47	1.66	0.92
1.08	0.57	1.74	0.66
1.08	0.57	1.75	0.68
1.08	0.55	1.82	0.74
1.08	0.54	1.89	0.81
1.08	0.57	1.76	0.68
1.08	0.57	1.73	0.65
1.08	0.55	1.83	0.76
1.08	0.57	1.74	0.66
1.08	0.54	1.90	0.82
1.08	0.58	1.70	0.63
1.87	0.55	3.19	1.33
1.89	0.58	2.97	1.07
1.99	0.58	3.08	1.09
1.99	0.40	5.99	4.00
0.35	0.32	1.61	1.26
0.40	0.21	3.96	3.56
0.47	0.36	1.65	1.18
0.47	0.24	3.66	3.20
0.47	0.37	1.63	1.16
2.36	1.00	1.26	-1.10
2.36	1.00	1.31	-1.05
2.41	1.00	1.63	-0.78
2.41	1.00	1.57	-0.84
2.42	1.00	1.63	-0.79
2.42	1.00	1.70	-0.72
2.42	1.00	1.65	-0.77
2.42	1.00	1.61	-0.81
2.63	1.00	1.57	-1.06
2.63	1.00	1.61	-1.02
2.63	1.00	1.58	-1.04
2.63	1.00	1.80	-0.83
2.63	1.00	2.50	-0.13
3.36	1.00	1.87	-1.49
3.36	1.00	1.93	-1.43
3.36	1.00	1.87	-1.50
3.36	1.00	1.77	-1.59
3.36	1.00	1.98	-1.39
3.36	1.00	1.88	-1.49
3.36	1.00	1.87	-1.49
3.36	1.00	2.06	-1.30
3.42	1.00	1.84	-1.58
3.42	1.00	1.81	-1.61
3.42	1.00	1.87	-1.55
3.42	1.00	1.87	-1.55
3.42	1.00	3.18	-0.25
3.42	1.00	2.31	-1.11
3.42	1.00	2.48	-0.94

2022 to 2027 (5 Year) with Improvements			
Projected Flow (MGD)	d/D	Projected Capacity (MGD)	Excess Capacity Available (MGD)
0.47	0.45	1.11	0.64
0.52	0.51	1.01	0.49
0.52	0.51	1.01	0.49
0.52	0.51	1.01	0.49
0.52	0.51	1.01	0.49
0.52	0.51	1.01	0.49
0.57	0.54	1.01	0.43
0.57	0.54	1.01	0.43
0.57	0.45	1.38	0.80
0.58	0.56	0.98	0.40
0.60	0.45	1.41	0.81
0.60	0.53	1.08	0.48
0.65	0.62	0.93	0.28
0.66	0.63	0.92	0.25
0.66	0.63	0.92	0.25
0.66	0.63	0.92	0.26
0.70	0.66	0.92	0.21
0.72	0.66	0.94	0.22
0.72	0.67	0.92	0.20
0.73	0.68	0.91	0.18
0.74	0.46	1.71	0.97
0.74	0.47	1.66	0.92
1.08	0.57	1.74	0.66
1.08	0.57	1.75	0.68
1.08	0.55	1.82	0.74
1.08	0.54	1.89	0.81
1.08	0.57	1.76	0.68
1.08	0.57	1.73	0.65
1.08	0.55	1.83	0.76
1.08	0.57	1.74	0.66
1.08	0.54	1.90	0.82
1.08	0.58	1.70	0.63
1.87	0.55	3.19	1.33
1.89	0.58	2.97	1.07
1.99	0.58	3.08	1.09
1.99	0.49	4.13	2.14
0.35	0.32	1.61	1.26
0.40	0.21	3.96	3.56
0.47	0.36	1.65	1.18
0.47	0.24	3.66	3.20
0.26	0.27	1.63	1.37
0.28	0.32	1.26	0.98
0.28	0.31	1.31	1.03
0.34	0.31	1.63	1.29
0.34	0.31	1.57	1.23
0.35	0.31	1.63	1.28
0.35	0.31	1.70	1.35
0.35	0.31	1.65	1.30
0.35	0.31	1.65	1.30
0.35	0.32	1.61	1.26
0.59	0.42	1.57	0.98
0.59	0.42	1.61	1.02
0.59	0.42	1.58	0.99
0.59	0.39	1.80	1.21
0.59	0.33	2.50	1.91
0.21	0.15	4.06	3.85
2.16	0.51	4.11	1.96
2.16	0.50	4.38	2.22
2.16	0.44	5.35	3.19
2.16	0.44	5.45	3.29
1.38	0.64	1.87	0.49
1.38	0.63	1.93	0.54

2027 to 2032 (10 Year) without Improvements			
Projected Flow (MGD)	d/D	Projected Capacity (MGD)	Excess Capacity Available (MGD)
0.39	0.41	1.11	0.72
0.46	0.48	1.01	0.54
0.46	0.48	1.01	0.54
0.46	0.48	1.01	0.54
0.46	0.48	1.01	0.54
0.46	0.48	1.01	0.54
0.58	0.54	1.01	0.43
0.58	0.54	1.01	0.43
0.58	0.45	1.38	0.80
0.59	0.56	0.98	0.39
0.61	0.46	1.41	0.80
0.61	0.54	1.08	0.47
0.67	0.63	0.93	0.26
0.68			

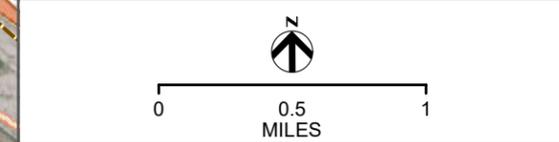


**Appendix B: Sewer Collection System Capacity Figures**



Marana Town Limit  
 · Manhole  
 — Sewer Line  
**Sewer Interceptor**  
 Branch A  
 Branch B  
 Branch C  
 Branch D  
 Branch E  
 Branch F  
 Branch G  
 Branch H  
 Branch I  
 Branch J  
 Branch K

**SEWER INFRASTRUCTURE  
IMPROVEMENT PLAN (IIP)**  
 SEWER COLLECTION SYSTEM CAPACITY  
EXISTING CONDITIONS

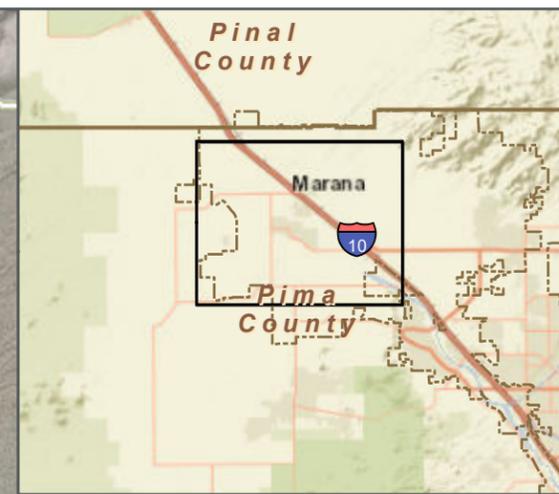
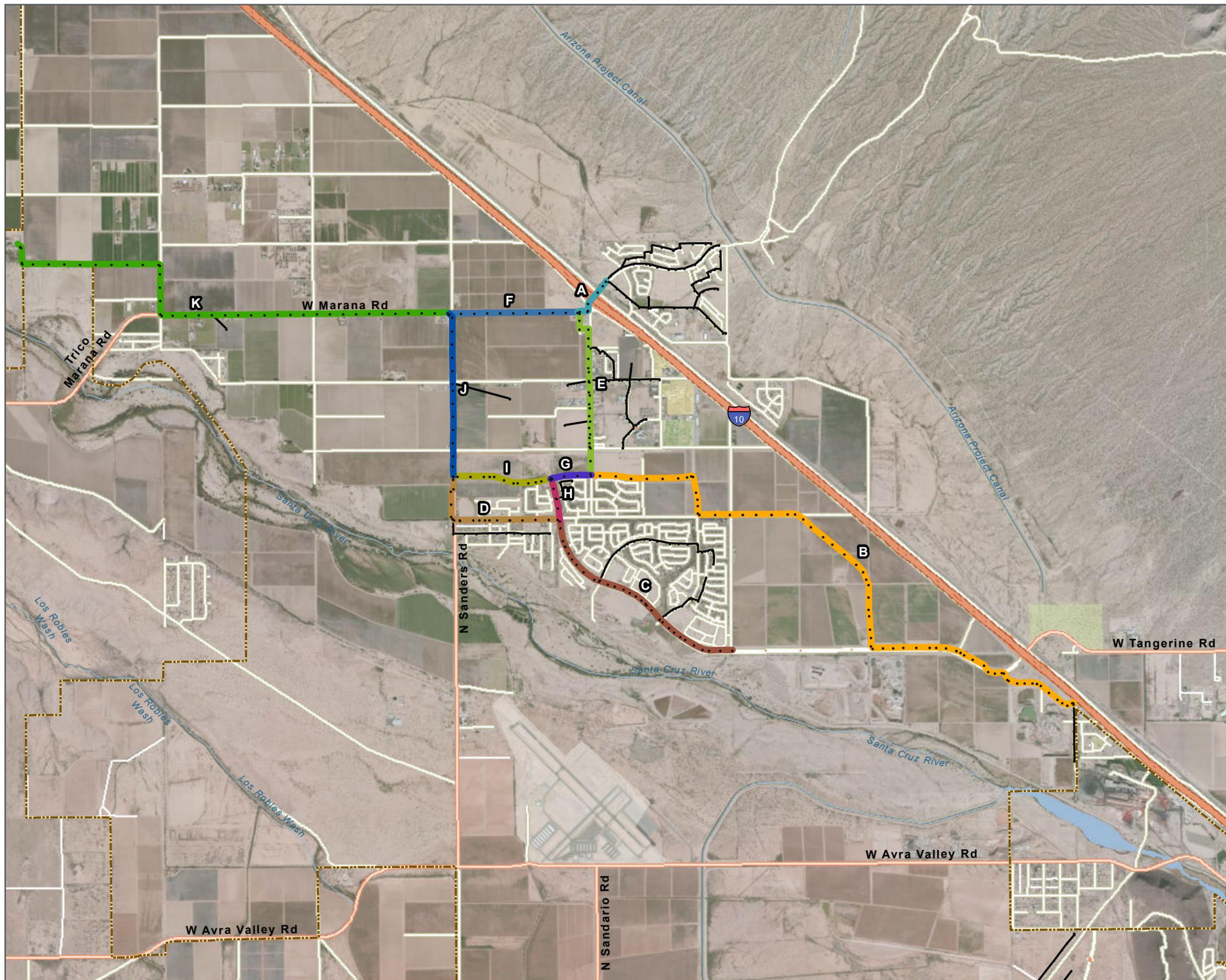




**MARANA AZ**  
WATER



**FIGURE A-1**

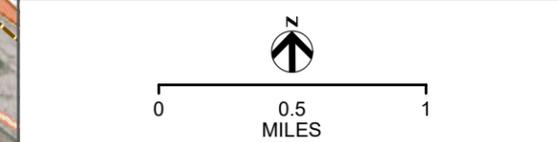


Marana Town Limit  
 · Manhole  
 — Sewer Line  
 Sewer Interceptor d/D > 0.70

**Sewer Interceptor**

- Branch A
- Branch B
- Branch C
- Branch D
- Branch E
- Branch F
- Branch G
- Branch H
- Branch I
- Branch J
- Branch K

**SEWER INFRASTRUCTURE  
 IMPROVEMENT PLAN (IIP)**  
 SEWER COLLECTION SYSTEM CAPACITY  
 2022 TO 2027 (5 YEAR)  
 WITHOUT IMPROVEMENTS

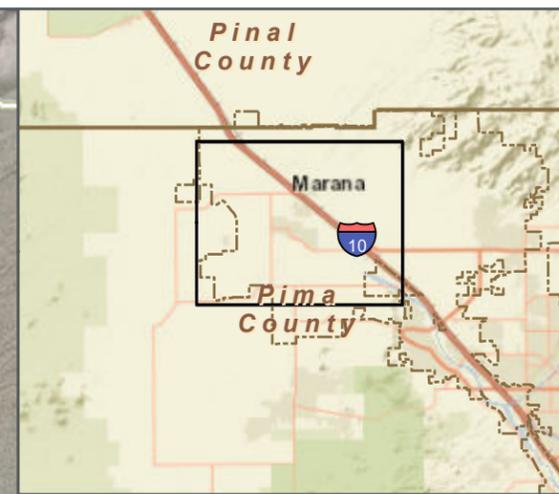
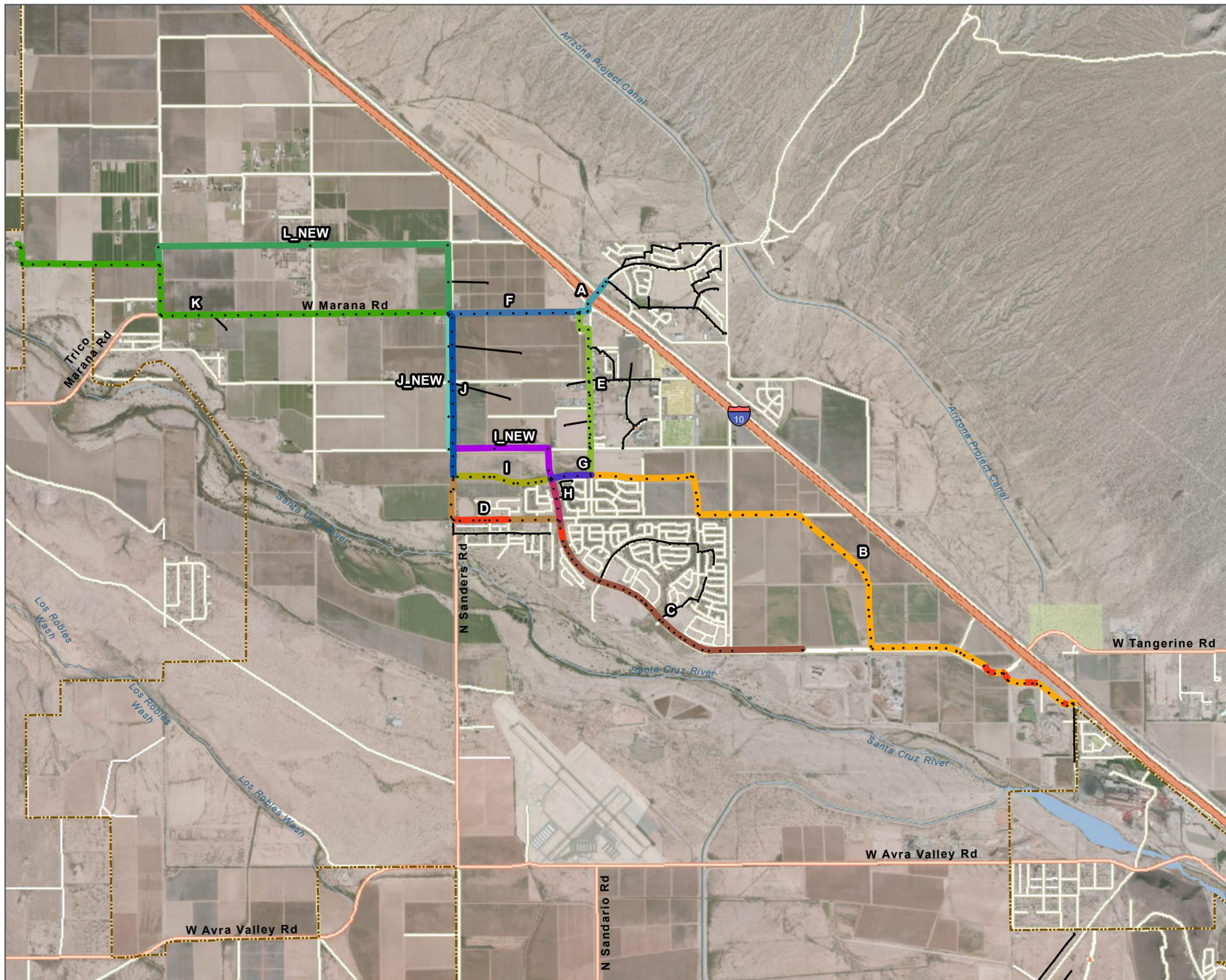




**MARANA AZ**  
WATER

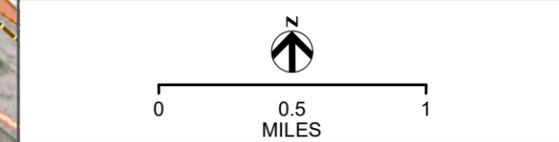


**FIGURE A-2**



- Marana Town Limit
- Manhole
- Sewer Line
- Sewer Interceptor  $d/D > 0.70$
- Sewer Interceptor**
- Branch A
- Branch B
- Branch C
- Branch D
- Branch E
- Branch F
- Branch G
- Branch H
- Branch I
- New Branch I
- Branch J
- New Branch J
- Branch K
- New Branch L

**SEWER INFRASTRUCTURE  
IMPROVEMENT PLAN (IIP)**  
SEWER COLLECTION SYSTEM CAPACITY  
2022 TO 2027 (5 YEAR)  
WITH IMPROVEMENTS

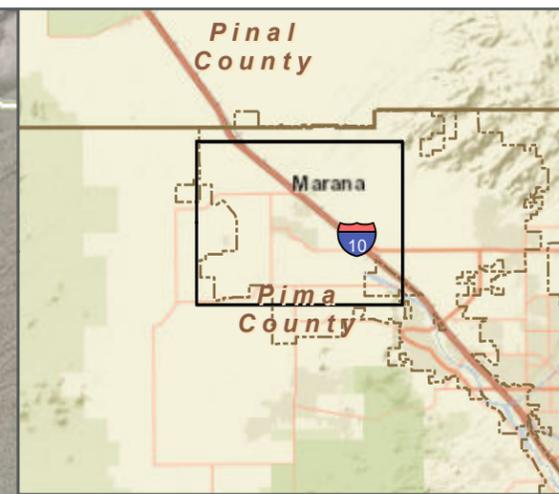
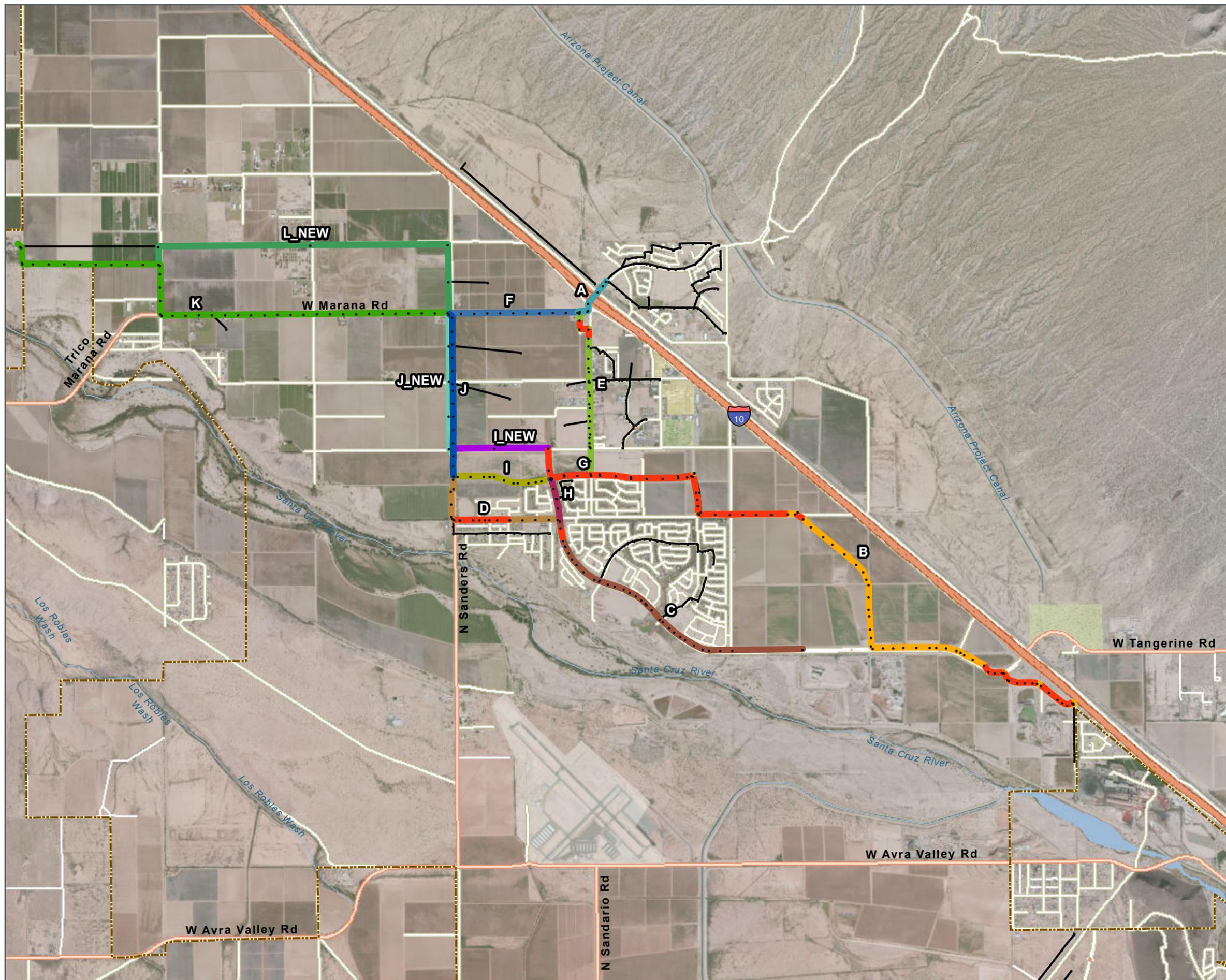




**MARANA AZ**  
WATER



**FIGURE A-3**

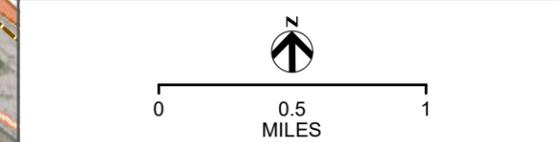


Marana Town Limit  
 · Manhole  
 — Sewer Line  
 Sewer Interceptor  $d/D > 0.70$

**Sewer Interceptor**

- Branch A
- Branch B
- Branch C
- Branch D
- Branch E
- Branch F
- Branch G
- Branch H
- Branch I
- New Branch I
- Branch J
- New Branch J
- Branch K
- New Branch L

**SEWER INFRASTRUCTURE  
 IMPROVEMENT PLAN (IIP)**  
 SEWER COLLECTION SYSTEM CAPACITY  
 2027 TO 2032 (10 YEAR)  
 WITHOUT IMPROVEMENTS





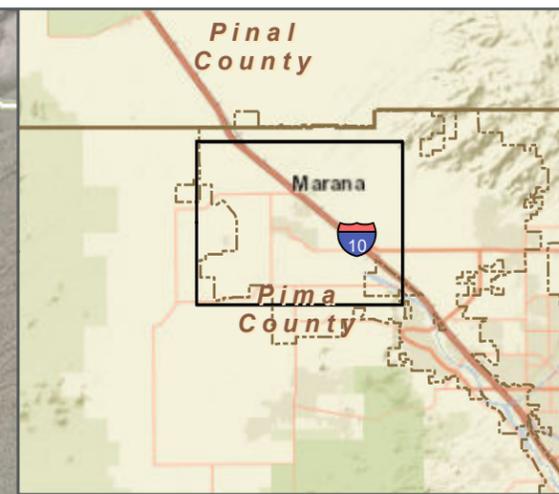
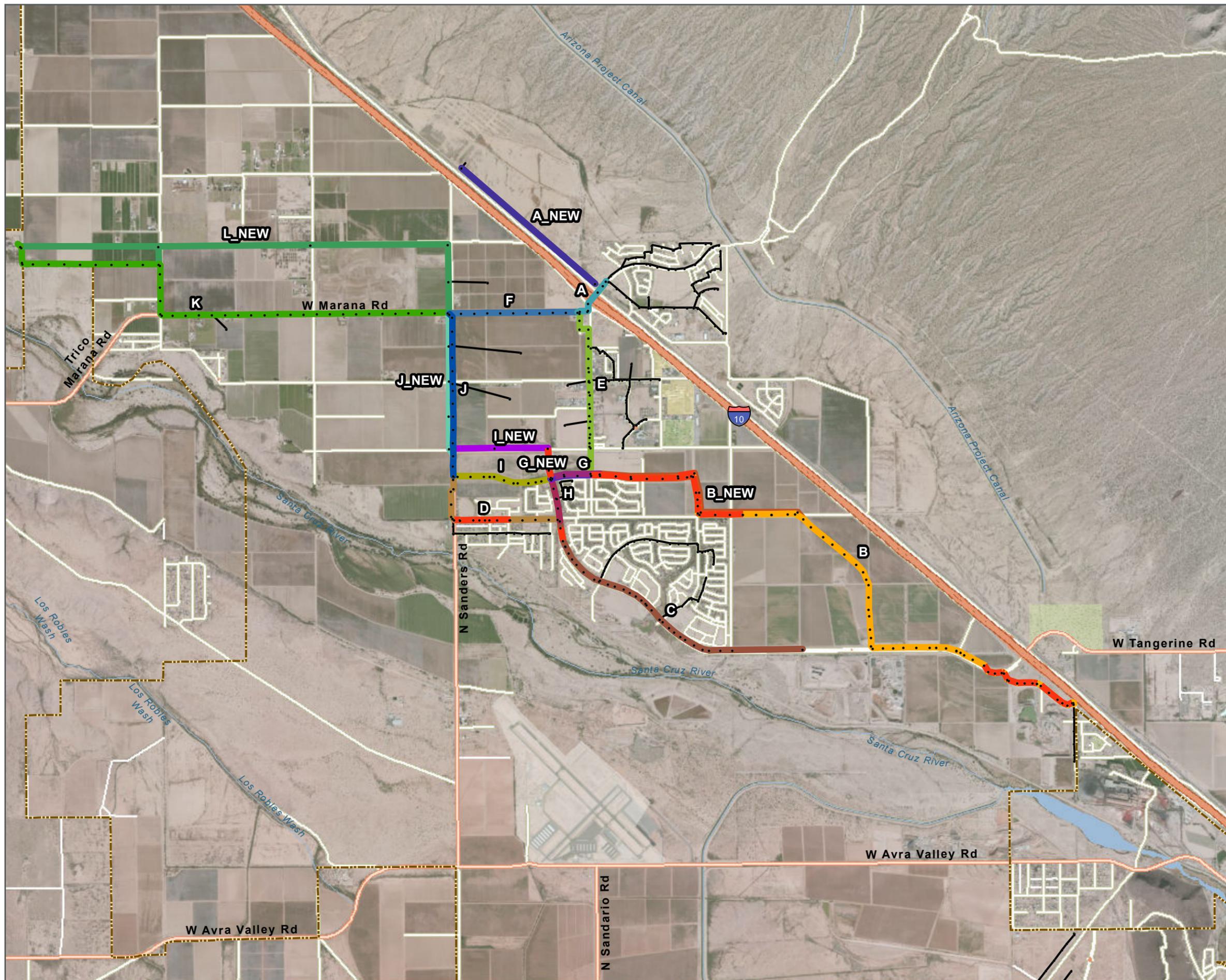
**MARANA AZ**  
WATER



**HDR**

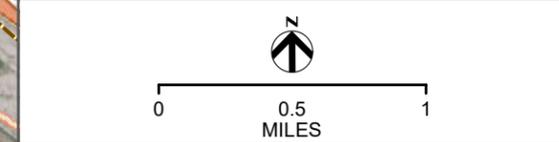
FIGURE A-4





- Marana Town Limit
  - Manhole
  - Sewer Line
  - Sewer Interceptor d/D > 0.70
- Sewer Interceptor**
- Branch A
  - New Branch A
  - Branch B
  - New Branch B
  - Branch C
  - Branch D
  - Branch E
  - Branch F
  - Branch G
  - New Branch G
  - Branch H
  - Branch I
  - New Branch I
  - Branch J
  - New Branch J
  - Branch K
  - New Branch L

**SEWER INFRASTRUCTURE  
IMPROVEMENT PLAN (IIP)**  
SEWER COLLECTION SYSTEM CAPACITY  
2027 TO 2032 (10 YEAR)  
WITH IMPROVEMENTS





**MARANA AZ**  
WATER



**FIGURE A-5**

**Appendix C: CIP Cost Tables**

Town of Marana Sewer IIP  
CIP Cost Summary

Year	ID	Construction Costs			Mob/ Demob 1%	General Conditions 8%	Overhead 10%	Contractor Costs			Profit 6%	Other Costs			Total
		Direct Costs	25% Contingency	Sub-Total				Bonds + Insurance 2%	Sub-Total	Sub-Total		8.1% Sales Tax	Sub-Total	8% Design	
2022-2027	3	\$1,451,000	\$362,750	<b>\$1,813,750</b>	\$18,138	\$145,100	\$197,699	\$43,494	<b>\$2,218,180</b>	\$133,091	<b>\$2,351,271</b>	\$190,453	<b>\$2,541,724</b>	\$203,338	<b>\$2,745,062</b>
	4	\$1,620,810	\$405,203	<b>\$2,026,013</b>	\$20,260	\$162,081	\$220,835	\$48,584	<b>\$2,477,773</b>	\$148,666	<b>\$2,626,439</b>	\$212,742	<b>\$2,839,181</b>	\$227,134	<b>\$3,066,315</b>
	5	\$897,000	\$224,250	<b>\$1,121,250</b>	\$11,213	\$89,700	\$122,216	\$26,888	<b>\$1,371,266</b>	\$82,276	<b>\$1,453,542</b>	\$117,737	<b>\$1,571,279</b>	\$125,702	<b>\$1,696,982</b>
	6	\$1,604,000	\$401,000	<b>\$2,005,000</b>	\$20,050	\$160,400	\$218,545	\$48,080	<b>\$2,452,075</b>	\$147,124	<b>\$2,599,199</b>	\$210,535	<b>\$2,809,735</b>	\$224,779	<b>\$3,034,513</b>
	7	\$1,782,000	\$445,500	<b>\$2,227,500</b>	\$22,275	\$178,200	\$242,798	\$53,415	<b>\$2,724,188</b>	\$163,451	<b>\$2,887,639</b>	\$233,899	<b>\$3,121,538</b>	\$249,723	<b>\$3,371,261</b>
	8	\$20,700,000	\$5,175,000	<b>\$25,875,000</b>	\$258,750	\$2,070,000	\$2,820,375	\$620,483	<b>\$31,644,608</b>	\$1,898,676	<b>\$33,543,284</b>	\$2,717,006	<b>\$36,260,290</b>	\$2,900,823	<b>\$39,161,113</b>
<b>TOTAL (2022 - 2027)</b>														<b>\$53,075,246</b>	
2027-2032	9	\$1,604,000	\$401,000	<b>\$2,005,000</b>	\$20,050	\$160,400	\$218,545	\$48,080	<b>\$2,452,075</b>	\$147,124	<b>\$2,599,199</b>	\$210,535	<b>\$2,809,735</b>	\$224,779	<b>\$3,034,513</b>
	10	\$3,071,000	\$767,750	<b>\$3,838,750</b>	\$38,388	\$307,100	\$418,424	\$92,053	<b>\$4,694,714</b>	\$281,683	<b>\$4,976,397</b>	\$403,088	<b>\$5,379,486</b>	\$430,359	<b>\$5,809,844</b>
	11	\$2,379,000	\$594,750	<b>\$2,973,750</b>	\$29,738	\$237,900	\$324,139	\$71,311	<b>\$3,636,837</b>	\$218,210	<b>\$3,855,047</b>	\$312,259	<b>\$4,167,306</b>	\$333,384	<b>\$4,500,690</b>
<b>TOTAL (2027 - 2032)</b>														<b>\$13,345,048</b>	
<b>TOTAL</b>														<b>\$66,420,294</b>	

## Gravity Pipe

Improvement ID: 3

### Design Parameters:

Pipe Length	3600 FT
Pipe Size	24 IN

### Assumptions:

<b>Fiscal Year:</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	<b>27/28</b>	<b>28/29</b>	<b>29/30</b>	<b>30/31</b>	<b>31/32</b>	<b>Total</b>
<b>CIP Budget:</b>		\$1,451,000									\$1,451,000

### Construction Costs

Construction	\$1,451,000
Contingency @ 25%	\$362,750
<b>Subtotal Construction Cost</b>	<b>\$1,813,750</b>

### Contractor Costs

Mob/Demob (1%)	\$18,138
General Conditions (8%)	\$145,100
Overhead (10%)	\$197,699
Bonds + Insurance (2%)	\$43,494
Profit (6%)	\$133,091
<b>Subtotal Contractor Cost</b>	<b>\$537,521</b>

### Other Costs

Sales Tax (8.1%)	\$190,453
Engineering Design (8%)	\$203,338
<b>Subtotal Other Costs</b>	<b>\$393,791</b>

**Total Project Cost \$2,745,062**

Construction Costs	Unit	Quantity	Unit Cost	Extended Cost
Gravity Pipe	LF	3600	\$331	\$1,192,320
Manholes	EA	9	\$28,750	\$258,750
<b>Sub-Total</b>				<b>\$1,451,000</b>
Contingency (25%)				\$362,750
<b>Subtotal Construction Cost</b>				<b>\$1,813,750</b>

## Gravity Pipe

Improvement ID: 4

### Design Parameters:

Pipe Length	5300 FT
Pipe Size	27 IN

**Assumptions:** 31% of construction costs are assigned to existing 15-inch line, and 69% of construction costs are assigned to the new 27-inch line

<b>Fiscal Year:</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	<b>27/28</b>	<b>28/29</b>	<b>29/30</b>	<b>30/31</b>	<b>31/32</b>	<b>Total</b>
<b>CIP Budget:</b>		\$2,349,000									\$2,349,000

### Construction Costs

Construction	\$1,620,810 (assume 69% of total construction costs)
Contingency @ 25%	\$405,203
<b>Subtotal Construction Cost</b>	<b>\$2,026,013</b>

### Contractor Costs

Mob/Demob (1%)	\$20,260
General Conditions (8%)	\$162,081
Overhead (10%)	\$220,835
Bonds + Insurance (2%)	\$48,584
Profit (6%)	\$148,666
<b>Subtotal Contractor Cost</b>	<b>\$600,427</b>

### Other Costs

Sales Tax (8.1%)	\$212,742
Engineering Design (8%)	\$227,134
<b>Subtotal Other Costs</b>	<b>\$439,876</b>

**Total Project Cost \$3,066,315**

Construction Costs	Unit	Quantity	Unit Cost	Extended Cost
Gravity Pipe	LF	5300	\$373	\$1,974,780
Manholes	EA	13	\$28,750	\$373,750
<b>Sub-Total</b>				<b>\$2,349,000</b>
Contingency (25%)				\$587,250
<b>Subtotal Construction Cost</b>				<b>\$2,936,250</b>

## Gravity Pipe

Improvement ID: 5

### Design Parameters:

Pipe Length	2800 FT
Pipe Size	27 IN

### Assumptions:

<b>Fiscal Year:</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	<b>27/28</b>	<b>28/29</b>	<b>29/30</b>	<b>30/31</b>	<b>31/32</b>	<b>Total</b>
<b>CIP Budget:</b>		\$897,000									\$897,000

### Construction Costs

Construction	\$897,000
Contingency @ 25%	\$224,250
<b>Subtotal Construction Cost</b>	<b>\$1,121,250</b>

### Contractor Costs

Mob/Demob (1%)	\$11,213
General Conditions (8%)	\$89,700
Overhead (10%)	\$122,216
Bonds + Insurance (2%)	\$26,888
Profit (6%)	\$82,276
<b>Subtotal Contractor Cost</b>	<b>\$332,292</b>

### Other Costs

Sales Tax (8.1%)	\$117,737
Engineering Design (8%)	\$125,702
<b>Subtotal Other Costs</b>	<b>\$243,439</b>

**Total Project Cost \$1,696,982**

Construction Costs	Unit	Quantity	Unit Cost	Extended Cost
Gravity Pipe	LF	2800	\$248	\$695,520
Manholes	EA	7	\$28,750	\$201,250
<b>Sub-Total</b>				<b>\$897,000</b>
Contingency (25%)				\$224,250
<b>Subtotal Construction Cost</b>				<b>\$1,121,250</b>

## Gravity Pipe

Improvement ID: 6

### Design Parameters:

Pipe Length	5300 FT
Pipe Size	27 IN

### Assumptions:

<b>Fiscal Year:</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	<b>27/28</b>	<b>28/29</b>	<b>29/30</b>	<b>30/31</b>	<b>31/32</b>	<b>Total</b>
<b>CIP Budget:</b>		\$1,604,000									\$1,604,000

### Construction Costs

Construction	\$1,604,000
Contingency @ 25%	\$401,000
<b>Subtotal Construction Cost</b>	<b>\$2,005,000</b>

### Contractor Costs

Mob/Demob (1%)	\$20,050
General Conditions (8%)	\$160,400
Overhead (10%)	\$218,545
Bonds + Insurance (2%)	\$48,080
Profit (6%)	\$147,124
<b>Subtotal Contractor Cost</b>	<b>\$594,199</b>

### Other Costs

Sales Tax (8.1%)	\$210,535
Engineering Design (8%)	\$224,779
<b>Subtotal Other Costs</b>	<b>\$435,314</b>

**Total Project Cost \$3,034,513**

Construction Costs	Unit	Quantity	Unit Cost	Extended Cost
Gravity Pipe	LF	5300	\$248	\$1,316,520
Manholes	EA	10	\$28,750	\$287,500
<b>Sub-Total</b>				<b>\$1,604,000</b>
Contingency (25%)				\$401,000
<b>Subtotal Construction Cost</b>				<b>\$2,005,000</b>

## Gravity Pipe

Improvement ID: 7

### Design Parameters:

Pipe Length	5900 FT
Pipe Size	27 IN

### Assumptions:

<b>Fiscal Year:</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	<b>27/28</b>	<b>28/29</b>	<b>29/30</b>	<b>30/31</b>	<b>31/32</b>	<b>Total</b>
<b>CIP Budget:</b>		\$1,782,000									\$1,782,000

### Construction Costs

Construction	\$1,782,000
Contingency @ 25%	\$445,500
<b>Subtotal Construction Cost</b>	<b>\$2,227,500</b>

### Contractor Costs

Mob/Demob (1%)	\$22,275
General Conditions (8%)	\$178,200
Overhead (10%)	\$242,798
Bonds + Insurance (2%)	\$53,415
Profit (6%)	\$163,451
<b>Subtotal Contractor Cost</b>	<b>\$660,139</b>

### Other Costs

Sales Tax (8.1%)	\$233,899
Engineering Design (8%)	\$249,723
<b>Subtotal Other Costs</b>	<b>\$483,622</b>

**Total Project Cost \$3,371,261**

Construction Costs	Unit	Quantity	Unit Cost	Extended Cost
Gravity Pipe	LF	5900	\$248	\$1,465,560
Manholes	EA	11	\$28,750	\$316,250
<b>Sub-Total</b>				<b>\$1,782,000</b>
Contingency (25%)				\$445,500
<b>Subtotal Construction Cost</b>				<b>\$2,227,500</b>



**Marana WRF Expansion**

Improvement ID: 8

**Design Parameters:**

Water Reclamation Facility                      1.5 MGD

**Assumptions:**

<b>Fiscal Year:</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	<b>27/28</b>	<b>28/29</b>	<b>29/30</b>	<b>30/31</b>	<b>31/32</b>	<b>Total</b>
<b>CIP Budget:</b>			\$2,900,823	\$9,000,000	\$9,000,000						\$20,900,823

**Construction Costs**

Construction                      \$20,700,000  
 Contingency @ 25%                \$5,175,000

**Subtotal Construction Cost      \$25,875,000**

**Contractor Costs**

Mob/Demob (1%)                    \$258,750  
 General Conditions (8%)          \$2,070,000  
 Overhead (10%)                    \$2,820,375  
 Bonds + Insurance (2%)            \$620,483  
 Profit (6%)                          \$1,898,676

**Subtotal Contractor Cost        \$7,668,284**

**Other Costs**

Sales Tax (8.1%)                    \$2,717,006  
 Engineering Design (8%)          \$2,900,823

**Subtotal Other Costs              \$5,617,829**

**Total Project Cost                \$39,161,113**

<b>Construction Costs</b>	<b>Unit</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Extended Cost</b>
Treatment	EA	1.5	\$13,800,000	\$20,700,000
<b>Sub-Total</b>				<b>\$20,700,000</b>
Contingency (25%)				\$5,175,000
<b>Subtotal Construction Cost</b>				<b>\$25,875,000</b>

## Gravity Pipe

Improvement ID: 9

### Design Parameters:

Pipe Length	5300 FT
Pipe Size	27 IN

### Assumptions:

<b>Fiscal Year:</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	<b>27/28</b>	<b>28/29</b>	<b>29/30</b>	<b>30/31</b>	<b>31/32</b>	<b>Total</b>
<b>CIP Budget:</b>									\$1,604,000		\$1,604,000

### Construction Costs

Construction	\$1,604,000
Contingency @ 25%	\$401,000
<b>Subtotal Construction Cost</b>	<b>\$2,005,000</b>

### Contractor Costs

Mob/Demob (1%)	\$20,050
General Conditions (8%)	\$160,400
Overhead (10%)	\$218,545
Bonds + Insurance (2%)	\$48,080
Profit (6%)	\$147,124
<b>Subtotal Contractor Cost</b>	<b>\$594,199</b>

### Other Costs

Sales Tax (8.1%)	\$210,535
Engineering Design (8%)	\$224,779
<b>Subtotal Other Costs</b>	<b>\$435,314</b>

**Total Project Cost \$3,034,513**

Construction Costs	Unit	Quantity	Unit Cost	Extended Cost
Gravity Pipe	LF	5300	\$248	\$1,316,520
Manholes	EA	10	\$28,750	\$287,500
<b>Sub-Total</b>				<b>\$1,604,000</b>
Contingency (25%)				\$401,000
<b>Subtotal Construction Cost</b>				<b>\$2,005,000</b>

## Gravity Pipe

Improvement ID: 10

### Design Parameters:

Pipe Length	11500 FT
Pipe Size	15 IN

### Assumptions:

<b>Fiscal Year:</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	<b>27/28</b>	<b>28/29</b>	<b>29/30</b>	<b>30/31</b>	<b>31/32</b>	<b>Total</b>
<b>CIP Budget:</b>									\$3,071,000		\$3,071,000

### Construction Costs

Construction	\$3,071,000
Contingency @ 25%	\$767,750
<b>Subtotal Construction Cost</b>	<b>\$3,838,750</b>

### Contractor Costs

Mob/Demob (1%)	\$38,388
General Conditions (8%)	\$307,100
Overhead (10%)	\$418,424
Bonds + Insurance (2%)	\$92,053
Profit (6%)	\$281,683
<b>Subtotal Contractor Cost</b>	<b>\$1,137,647</b>

### Other Costs

Sales Tax (8.1%)	\$403,088
Engineering Design (8%)	\$430,359
<b>Subtotal Other Costs</b>	<b>\$833,447</b>

**Total Project Cost \$5,809,844**

Construction Costs	Unit	Quantity	Unit Cost	Extended Cost
Gravity Pipe	LF	11500	\$207	\$2,380,500
Manholes	EA	24	\$28,750	\$690,000
<b>Sub-Total</b>				<b>\$3,071,000</b>
Contingency (25%)				\$767,750
<b>Subtotal Construction Cost</b>				<b>\$3,838,750</b>

## Gravity Pipe, Lift Station, and Force Main

Improvement ID: 11

### Design Parameters:

Pipe Length	6800 FT
Pipe Size	18 IN
Lift Station	210 gpm
	0.3024 MGD
Force Main	6800 FT
Force Main Size	6 IN

### Assumptions:

<b>Fiscal Year:</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	<b>27/28</b>	<b>28/29</b>	<b>29/30</b>	<b>30/31</b>	<b>31/32</b>	<b>Total</b>
<b>CIP Budget:</b>									\$2,379,000		\$2,379,000

### Construction Costs

Construction	\$2,379,000
Contingency @ 25%	\$594,750
<b>Subtotal Construction Cost</b>	<b>\$2,973,750</b>

### Contractor Costs

Mob/Demob (1%)	\$29,738
General Conditions (8%)	\$237,900
Overhead (10%)	\$324,139
Bonds + Insurance (2%)	\$71,311
Profit (6%)	\$218,210
<b>Subtotal Contractor Cost</b>	<b>\$881,297</b>

### Other Costs

Sales Tax (8.1%)	\$312,259
Engineering Design (8%)	\$333,384
<b>Subtotal Other Costs</b>	<b>\$645,643</b>

**Total Project Cost \$4,500,690**

Construction Costs	Unit	Quantity	Unit Cost	Extended Cost
Gravity Pipe	LF	6800	\$248	\$1,689,120
Manholes	EA	24	\$28,750	\$690,000
Lift Station	MGD	0.302	\$690,000	\$208,656
Force Main	LF	6800	\$55	\$375,360
<b>Sub-Total</b>				<b>\$2,379,000</b>
Contingency (25%)				\$594,750
<b>Subtotal Construction Cost</b>				<b>\$2,973,750</b>