RESOLUTION NO. 2020-368

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PARKER, FLORIDA, AUTHORIZING THE ADOPTION OF THE FINAL WASTEWATER ASSET MANAGEMENT PLAN IN CONNECTION WITH THE STATE REVOLVING FUND PROJECT NO. WW030711 BETWEEN THE STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, AND THE CITY OF PARKER, FLORIDA; REPEALING ALL RESOLUTIONS IN CONFLICT HEREWITH AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Florida Statutes provide for loans to local government agencies to finance the construction of wastewater treatment facilities;

WHEREAS, Florida Administrative Code rules require authorization to apply for loans, to establish pledged revenues, to designate an authorized representative, to provide assurances of compliance with loan program requirements, and to enter into a loan agreement;

WHEREAS, the State Revolving Fund requires an Asset Management Plan in association with funding for State Revolving Fund Project No. WW030711; and

WHEREAS the City of Parker, Florida, has entered into a loan agreement with the Department of Environmental Protection under the State Revolving Fund for project financing.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PARKER, FLORIDA, AS FOLLOWS:

SECTION 1. The Wastewater Asset Management Plan as submitted to the City of Parker and the State Revolving Fund on April 22, 2020 (a copy of which is on file with the City Clerk) is adopted by the City of Parker.

SECTION 2. All other resolutions or parts of resolutions of the City in conflict with the provisions of this Resolution are hereby repealed to the extent of such conflict.

SECTION 3. If any section, paragraph, sentence, or clause hereof or any provision of this Resolution is declared to be invalid or unconstitutional, the remaining provisions of this Resolution shall be unaffected thereby and shall remain in full force and effect.

SECTION 4. This Resolution shall become effective immediately upon its passage and adoption.

PASSED, APPROVED AND ADOPTED by the City Council of the City of Parker, Florida on this 5th day of May, 2020.

CITY OF PARKER

RICHARD MUSGRAVE, MAYOR

ATTEST:

KAREN GRIFFIN, CITY CLERK

Examined and approved by me, this 5th day of May, 2019.

RICHARD MUSGRAVE, MAYOR

CITY OF PARKER WASTEWATER ASSET MANAGEMENT PLAN

1.1 INTRODUCTION

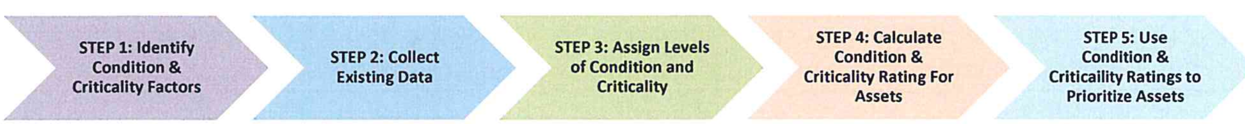
The City of Parker desires to identify and prioritize condition assessment and rehabilitation or replacement (R&R) efforts in their sanitary sewer system. As part of the City's Sanitary Sewer System Desktop Evaluation, a plan of action was developed to recommend long term, ongoing system rehabilitation and maintenance activities. The plan includes projects to meet immediate needs as well as a future rehabilitation strategy. The plan also presents a mechanism for the City to regularly update their current and future rehabilitation priorities. Regular system evaluation will help the City to continuously reinvest in their assets and help to provide the level of service that meets customer expectations and regulatory requirements. The purpose of this section is to describe the approach that will be used to set priorities for sanitary sewer system condition assessment and rehabilitation as it will be applied to the City's sanitary sewer service area.

In order to identify the immediate R&R needs and establish a framework for continuing future rehabilitation strategy, the collection system was evaluated based on condition (Likelihood of Failure - LoF) and criticality (Consequence of Failure - CoF). The primary purpose of this prioritization is to assign suitable levels of resources to inspect, maintain and rehabilitate parts of the collection systems. Simultaneous investigation and rehabilitation of the collection system is cost-prohibitive for most utilities. A suitable use of finite resources is to focus immediate rehabilitation on areas of the system with higher priorities and to monitor areas that are lower priority. In addition to this short term plan, it is important to create a long-term rehabilitation strategy that can be updated regularly and leads to a phased rehabilitation for the system components. The primary goal of the long term rehabilitation strategy is to be proactive in identifying potential problems and addressing them before any adverse impacts are caused.

1.2 OVERVIEW OF PRIORITIZATION PROCESS

Critical assets that should receive immediate inspection or rehabilitation can be identified by ranking them in terms of their Condition and Criticality. Assets whose failure might have larger impact on the community and environment and whose condition is the poorest will receive immediate inspection and/or rehabilitation. Assets that receive a lower criticality and condition rating will receive a level of continued monitoring but no immediate action or rehabilitation.

The prioritization process used consists of five steps as described in the figure below.



- Step 1 is to determine and identify the condition and criticality (CC) factors that will be used to evaluate the system.
- Step 2 is to collect the data that will be used to evaluate CC factors. Existing data will be used in the evaluation.
- Step 3 is to assign different levels to each factor. The purpose of assigning levels is to differentiate assets based on their condition or criticality.
- Step 4 is to assign a CC rating for each asset. These ratings are assigned by using the level assigned to each factor and the relative importance of each factor.
- Step 5 is to use the ratings to prioritize the system and determine short-term and long-term rehabilitation projects.

The following sections describe in more detail the steps of the prioritization process.

1.2.1 Identify Condition and Criticality Factors.

Factors that should be considered when performing the evaluation of the City's utility system include those related to both condition and criticality. In general, the criticality factors for each asset component can be grouped into four categories:

- Size
- Transportation Impacts
- Environmental Impacts
- Difficulty of Emergency Repair

The actual condition of most of the sanitary sewers in the service areas are unknown. Investigation and inventory of the current condition of the entire system can be cost-prohibitive unless performed over time. However, inspection results provided by the City were reviewed in order to determine the actual condition for some of the pipelines. For this evaluation, existing information such as Material of the Pipe, Pipe Age, and Maintenance issues from work order history and inspection score were used to estimate the condition of each asset. The condition factors for each of the components can be grouped into two categories:

- Structural Condition
- Maintenance

1.2.2 Collect Data

Existing GIS information and the work order information was used to evaluate each factor. This evaluation process should be updated with new data as information becomes available and the priorities can be revised. Table 1-1 lists the CC categories, the factors that were measured, and the data that have been used.

Table 1-1. Criticality and Condition Factors

Criticality	
Category	Factor
Size (Quantity of Flow Conveyed)	Pipe diameter
Transportation Impact	Proximity to roads, railroads, planned Sun Rail routes and stations, and bridges
Environmental Impact	Proximity to water bodies, major waterways, wetlands or storm water conveyance
Difficulty of Emergency Repair	Accessibility for maintenance or repairs, pipe depth, located under or near major structures

Condition	
Category	Factor
Structural	Pipe material and age
Maintenance	Number of past O&M issues (roots, stoppages, grease), locations where frequent cleaning is required, locations of past point repairs

1.2.3 Assign Levels of Condition and Criticality

It is essential to differentiate assets in terms of the criticality and condition by assigning levels to each CC factor from 1 to 10. The criticality factors are described in Table 1-2 and the condition levels are described in Table 1-3. The levels are applied to each pipe (as shown in the City's GIS).

Table 1-2. Level of Criticality by Category

Level	Description
1	Negligible
4	Low
7	Moderate
10	Severe

Table 1-3. Level of Condition by Category

Level	Description
1	Negligible
2	Unlikely
4	Possible
7	Likely
10	Very Likely

The level assigned increases as the consequence of failure or probability of failure increases. Methodology describing the process of assigning CC factors is discussed in the section below.

1.2.3.1 Criticality Factors

Pipe failure has the potential to impact transportation, business, the environment, the public, and the City repair crews regardless of where it occurs. The purpose of the ranking system is to differentiate the assets based on their consequence of failure. All pipes in the system will receive some level of monitoring, rehabilitation, or priority action. The goal is to match the pipes with an appropriate level of maintenance, condition evaluation, and rehabilitation. For example, pipes identified as being very critical in terms of their transportation or environmental impact would receive a higher frequency of inspection, maintenance, or rehabilitation.

The following paragraphs describe the criticality factors and levels. Levels are assigned based on the existing collection system infrastructure. Future development/land use may cause a change in the criticality of certain areas. These changes will be evaluated under the capacity analysis and CC levels assigned to reflect those changes in the future. Figures describing the assessment results for each criticality factor are provided in Appendix D.

Quantity of Flow Conveyed

The quantity of flow conveyed is estimated based on the size of the collection and force main piping, as well as the capacity of the pump stations. Pipes and force mains with larger diameters convey a larger quantity of wastewater than pipes of smaller diameters. The level assigned increases as the diameter of the pipe increases. Table 1-4 and Table 1-5 show the levels assigned for the 'Quantity of Flow' criticality factor. The pipe diameter was determined using GIS information provided by the City.

Table 1-4. Quantity of Flow Levels for Collection Piping – Gravity Sewers

Pipe Diameter	Level	Length of Pipe (ft.)	% of Total Pipe Length
≤ 6-inch	1	NA	NA
8 to 10-inch	4	143,564	98%
12 to 24-inch	7	3,316	2%
> 24-inch	10	NA	NA
Diameter Unknown	6	NA	NA

Table 1-5. Quantity of Flow Levels for Collection Piping – Force Mains

Pipe Diameter	Level	Length of Pipe (ft.)	% of Total Pipe Length
≤ 6-inch	1	15,742	56%
8 to 10-inch	4	3,643	13%
≤ 10 to 16-inch	7	8504.8	31%
> 16-inch	10	NA	NA
Diameter Unknown	6	NA	NA

The assets identified as being critical in terms of the quantity of flow they conveyed were the large diameter gravity sewers and force mains.

Transportation Impact

The impact to traffic if a pipe fails was estimated based on the type of road that the pipe is installed under or the type of road to which the sewer or force main is adjacent. It is assumed that if the pipe fails under a major thoroughfare, then the impact to traffic would be greater than if the pipe failed under a smaller street. Table 1-6 describes the levels assigned to each gravity sewer and force main, for the 'Transportation Impact' criticality factor. The road type was based on GIS streets files.

Table 1-6. Transportation Impact Levels

Transportation Impact	Level	Gravity Sewer Length of Pipe (ft.)	Gravity Sewer % of Total Pipe Length	Force Main Length of Pipe (ft.)	Force Main % of Total Pipe Length
>25' from any road	1	19,260	13%	2,228	8%
Within 25' of any road (local)	4	127,758	87%	25,661	92%
Within 26' to 100' of a railroad, planned Sunrail track or Sunrail station, bridge, or major road (US, CR, SR, Interstates)	7	8,963	6%	2,670.23	10%
Crosses or within 25' of any major road (US, CR, SR, identified City Road or Interstates), railroad, planned Sunrail track, or bridge.	10	18	12%	10.568	38%

The assets identified as being critical in terms of their transportation impact coincide with the major roadways and railroad crossings.

Environmental Impact

Any wastewater spill has an adverse effect on the environment. It is expected that the City of Parker maintenance crews would have a better chance of locating and containing a wastewater spill that occurs on land as compared to a spill that occurs in the water or reaches surface water. Therefore, the environmental impact was estimated based on the distance of the pipe to a water body or wetland and/or major storm water conveyance system as defined in GIS. A higher level is assigned as the distance to any water body decreases. In addition, a higher level is assigned if the pipe is within a certain distance of a water body or an area that has been identified as being environmentally sensitive. Table 1-7 describes the levels assigned to each pipe for the 'Environmental Impact' criticality factor.

Table 1-7. Environmental Impact Levels

Environmental Impact	Level	Gravity Sewer Length of Pipe (ft.)	Gravity Sewer % of Total Pipe Length	Force Main Length of Pipe (ft.)	Force Main % of Total Pipe Length
Within 10 ft. of an area impacted by a Category 1 Hurricane	10	1,521	1%	2,343	8%
Within 10 ft. of an area impacted by a Category 2 Hurricane	8	9,092	6%	4,525	16%
Within 10 ft. of an area impacted by a Category 3 Hurricane	6	13,784	9%	4,525	16%
Within 10 ft. of an area impacted by a Category 4 Hurricane	4	24,279	17%	14,593	53%
Within 10 ft. of an area impacted by a Category 5 Hurricane	2	41,288	28%	14,593	53%

Difficulty of Emergency Repair

Another component of criticality is the ability of City maintenance crews to easily repair a pipe or force main failure. If the pipes or force main are difficult to repair in an emergency then there is a greater potential for increased impacts to the community and environment. The difficulty of emergency repairs was measured by accessibility (difficulty to access by maintenance staff and equipment) and bypass pumping requirements. Force main accessibility is based on assumed depth (3 feet below surface elevation in residential neighborhoods, 3 to 6 feet deep under major roads, 6 to 8 feet deep under major highways). The depth of the pipe or force main is important when making an emergency repair. Pipes that are deep often require special safety equipment to access. In addition, deeper pipes may be below the water table such that excavation trenches would have to be dewatered, adding complexity and time to making the pipe repair. Table 1-8 describes the levels assigned to each gravity sewer or force main.

Table 1-8. Difficult Access levels for All Pipes

Pipe Depth	Level	Gravity Sewer Length of Pipe (ft.)	Gravity Sewer % of Total Pipe Length	Force Main Length of Pipe (ft.)	Force Main % of Total Pipe Length
< 6-ft	1	72,654	49.42	NA	NA
6-ft to 10-ft	4	55,917	38.03	NA	NA
10 to 15-ft	7	15,597	10.61	NA	NA
>15 or noted as access issues by City	10	1,160	0.79	NA	NA
Depth Unknown	7	1690	1.15	NA	NA

1.2.3.2 Condition Factors

In addition to criticality factors, each pipe was ranked based on condition. Those portions of the system that are in poor condition have a higher probability of failure and, therefore, should be higher priority for investigation and repair. Condition was evaluated based on two categories: structural condition and maintenance frequency. The following paragraphs describe the condition factors and the levels assigned. The assessment results for each condition factor are shown in figures provided in Appendix D.

Structural Condition

Investigation and inventory of the current structural condition of each pipe in the systems can be highly expensive unless performed over time. Therefore, most utilities have condition evaluations performed on portions of their system. The ultimate goal is to collect actual structural condition data for the entire system over time, and update this information with a frequency consistent with the criticality of the asset. The actual condition information was not readily available and eventually it can replace the surrogate data such as pipe material and age that can be used to evaluate the structural condition. However, a total of 17 Lift Stations and 47 sanitary sewer manholes are within the service area whose condition rating was considered as part of this evaluation. Wherever the sewer mains intersected the critical lift stations and manholes the condition rating for the lift stations and manholes was used in lieu of surrogate data for pipe condition and the same was included in the priority ratings.

Pipe Material

Pipe material is one of the surrogate factors that can be used if no other condition information is available. Certain types of material are more prone to corrosion or deterioration over time. Pipes of these materials (such as vitrified clay and concrete) received a higher level. Pipe materials such as polyvinyl chloride (PVC) and high density polyethylene (HDPE) have come into use fairly recently and are corrosion resistant; therefore, it is generally assumed that these pipes would be in better condition and receive a lower level. Tables 1-9 and 1-10 represent the typical levels assigned to various pipe materials.

Table 1-9. Pipe Material Levels for Wastewater Collection Piping – Gravity Sewers

Pipe Material	Description	Level	Length of Pipe (ft.)	% of Total Pipe Length
HDPE, PVC, Lined Pipe	High Density Polyethylene / Polyvinyl Chloride/Lined pipe (slip-lined or Cured in Place Pipe (CIPP)	1	140,524	95%
DIP	Ductile Iron Pipe	8	5,591	4%
ACP, VC	Asbestos/Vitrified Clay Cement Pipe	10	902	1%
Unknown	Material unknown	6	NA	NA

Table 1-10. Pipe Material Levels for Wastewater Collection Piping – Force Mains

Pipe Material	Description	Level	Length of Pipe (ft.)	% of Total Pipe Length
HDPE, PVC	High Density Polyethylene / Polyvinyl Chloride	1	9,146	34%
DIP, CIP	Ductile Iron Pipe, Cast Iron Pipe	7	4,574	17%
ACP/ VC	Asbestos Cement Pipe/ Vitrified Clay	10	NA	NA
Unknown	Material unknown	6	13,177	49%

Maintenance Frequency

Maintenance records, including the locations where frequent cleaning is required (hot spots) and the number of maintenance calls received in a particular area, were used to evaluate the maintenance required in parts of the system. Pipes with more frequent maintenance issues are assumed to have a higher probability of failure and are assigned a higher level than those areas requiring no maintenance. Maintenance frequency was based on the hot spot data provided by the City. Table 1-11 describes the levels assigned based on maintenance frequency determined for the collection system.

Table 1-11. Work Order Maintenance Levels for All Pipes

No. of Repairs/Type	Level	Gravity Sewer Length of Pipe (ft.)	Gravity Sewer % of Total Pipe Length	Force Main Length of Pipe (ft.)	Force Main % of Total Pipe Length
0 /Point Repairs	1	136,647	93%	22,743	82%
≥1/Point Repair	10	9,050	6%	NA	NA
>1/Joint Sealing	7	1,320	1%	5,147	18%

1.2.4 Calculating Condition and Criticality Rating

After a level of 1 to 10 is assigned to each pipe for each of the CC factors, an overall criticality rating and an overall condition rating are calculated for each system component. The overall ratings are also based on a scale of 1 to 10, with highest ratings assigned to those components that have the highest consequence or highest probability of failure. The asset's criticality rating is calculated using the levels assigned to each criticality factor (quantity of flow conveyed, transportation impact, environmental impact and difficulty of emergency repair) and their relative importance. The relative importance is the weighted average expressed as a percentage, applied to each criticality factor in order to calculate an overall rating. Similarly, for the condition factors, an overall rating was calculated for each category (structural condition, maintenance frequency, and capacity) based on their relative importance.

1.2.5 Prioritizing Based on Criticality and Condition Ratings

The combination of condition and criticality ratings determines priorities for repair or replacement of system assets. This will provide the City with a plan for focusing the available resources and funding on the most immediate needs. The results are summarized in the recommended course of action based on Condition and Criticality ratings. Figure 1.1 is a matrix showing the recommended course of action for each sewer system component based on the combination of condition and criticality ratings.

Figure 1.1. Recommended Course of Action Based on Condition and Criticality Ratings

Priority		Criticality			
		1-3	4-6	7-8	9-10
Condition	9-10	Mid Priority Program Rehab	High Priority Program Rehab	Highest Priority Immediate Action	Highest Priority Immediate Action
	7-8	Low Priority	Frequent Condition Evaluation	Frequent Condition Evaluation	Highest Priority Immediate Action
	4-6	Low Priority	Regular Monitoring	Frequent Condition Evaluation	Frequent Condition Evaluation
	1-3	Low Priority	Regular Monitoring	Regular Monitoring	Regular Monitoring

Highest Priority Action

Pipes that are both highly critical (criticality rating = 7 to 10) and in poor condition (condition rating = 10) are placed as the highest priority and near-term actions should include rehabilitation or replacement. These assets are both more likely to fail and have high consequences if a failure were to occur.

Program Rehabilitation

Pipes that are suspected to be in poor condition (condition rating = 10), but are not as critical (criticality rating =1 to 4) should be part of an on-going rehabilitation program. These assets could be prioritized within the rehabilitation program as 'High Priority Program Rehab' or 'Mid Priority Program Rehab'. The pipes under the high priority rehabilitation program are those that have a higher consequence of failure than those in the mid priority rehabilitation program.

Frequent Condition Evaluation

Pipes that are in fair condition (condition rating = 4 or 7), but are still very critical (criticality rating = 4 to 10) should have their condition evaluated frequently since the consequences of a failure are high. The purpose of frequent condition evaluation is to check if the condition has deteriorated to a point that the asset would be moved to the highest priority action category.

Regular Monitoring

The assets in the regular monitoring category cover a span of condition and criticality ratings that fall between the frequent condition evaluation and low priority categories. Assets in this group include the conditions ratings 1 and 4 as in the low priority group. However, they are more critical than the low priority category since they received a criticality rating of at least 4. Due to their higher criticality, they require regular monitoring. Some of the assets in this category are still very critical (rating 7 to 10), but are generally in better condition than the frequent condition evaluation category because their condition rating is a 1 or 4 as opposed to 7. The activities performed under regular monitoring are the same as those performed under frequent condition evaluation; however, the activities are not performed as often.

Low Priority

The low priority category includes assets that are believed to be in good to fair condition (condition rating = 1 to 7) and that are not considered critical (criticality rating = 1 or 2). The assets in this category will receive some level of condition monitoring to see if they need to be included in the program rehabilitation group.

Collection System Prioritization

Table 1-12 summarizes the recommended course of action as a percentage of the total service area collection system.

Table 1-12. Recommended Course of Action for All Pipes

Recommended Course of Action	Gravity Sewer Length of Pipe (ft.)	Gravity Sewer % of Total Pipe Length	Force Main Length of Pipe (ft.)	Force Main % of Total Pipe Length
Highest Priority Action	NA	NA	NA	NA
High Priority Program Rehab	434	< 1%	NA	NA
Mid Priority Program Rehab	468	< 1%	NA	NA
Frequent Condition Evaluation	95	< 1%	6,655	24%
Regular Monitoring	43,565	30%	21,235	76%
Low Priority Program Rehab	102,454	70%	NA	NA

Figures 1.2 through 1.5 show the gravity and force main criticality and condition scores for the study area based on criticality and condition factor prioritization for gravity mains and force mains respectively. Figures 1.6 and Figure 1.7 summarize the overall recommended course of action.

The results summarized in Table 1-12 and in Figures 1.6 and Figures 1.7 will serve as the basis in setting priorities for sanitary sewer system condition assessment and rehabilitation/ replacement as applied to the service area.

Lift stations and Manholes Prioritization.

The prioritized assessment of the City's collection system which included only the portion of the system which fell into the above described categories consists of 17 lift stations and 47 manholes. A large number of these are very old and are constructed using brick and mortar. Many of these are in poor condition due to age and the effects of corrosive gasses on these materials. Leaks in the walls of the lift station wet wells and manholes may also contribute to the higher inflow that is currently observed. In-order to steadily repair and/or refurbish the lift stations and manholes a desktop condition assessment was performed based on the available maintenance data. Lift stations and Manholes are ranked on the scale of 1-5 corresponding to highest scores assigned to those assets that have the highest probability of failure. In case a lift station or manhole was rated a lower probability of failure but intersects a pipe with higher probability of failure then the scoring for lift station and or manhole was overridden with highest probability of failure score to simulate an absolute worst case scenario.

Table 1-13. Recommended Course of Action for Lift stations and Manholes

Recommended Course of Action	Prioritization Score	Lift Stations	Manholes
High Priority Program Rehab	5	3	8
Mid Priority Program Rehab	4	0	8
Frequent Condition Evaluation	3	14	12

Regular Monitoring	2	0	8
Low Priority Program Rehab	1	0	11

Table 1-14. Estimated Cost for Replacement of Highest Priority Lift Stations

Asset Name	Condition	Replace Year	Replace Cost
P-3	Poor	2034	$ 250,000
P-14	Poor	2034	$ 250,000
P-17	Poor	2034	$ 250,000

Table 1-15. Estimated Cost for Replacement of Highest Priority Manholes

Structure ID	Condition	Replace Year	Replace/ Renewal Cost
111	Poor	2025	$50,000
244	Poor	2025	$50,000
279	Poor	2025	$50,000
319	Poor	2025	$50,000
322	Poor	2025	$50,000
326	Poor	2025	$50,000
533	Poor	2025	$50,000
534	Poor	2025	$50,000

1.3 WATER CONSERVATION

The Town should ensure that water conservation is at the forefront of their efforts to be good stewards of the environment. Although conservation is generally considered a drinking water issue, there are several ways that conservation can be undertaken on the wastewater side as well. The Northwest Florida Water Management District recommends that the entire community engage in conservation measures to that goal.

1.4 UTILITY CONSERVATION

Older sewer mains piping located throughout the City of Parker provides significant opportunity for leaks resulting in danger to the environment. Low cost leak detection is recommended until the town can replace that piping in order to prioritize which pipes need to be replaced first. Replacing of older piping should lead to better less inflow/infiltration in the city as well which would lessen the impact to the wastewater treatment plant. Inflow and infiltration (I/I) at manholes is a common problem. Infiltration is groundwater seeping in through defects in the walls or bottom (bench and invert). We generally line (or rehab) manholes to reduce infiltration. Inflow is stormwater entering manholes through holes or breaks in the lids and the areas around the lids. Much of this inflow can be drastically reduced by installing inexpensive inflow shields under the lids. We saw several older manhole lids with large pick holes that allow for large quantities of inflow. We suggest a program to install inflow shields in low lying manholes and any manholes known to have higher than normal inflow based on storm related lift station run times, or at least 10% of the system manholes per year.

Another important reason to address I/I: where there is infiltration there are possible sources of exfiltration- which means that untreated sewage can "leak" out of the cracked/compromised manholes, broken pipes, laterals, and into the surrounding ground. By limiting the amount of I/I, the utility can practice conservation "by proxy" in that additional water is not reaching the plant and then being treated resulting in loss of chemicals and capacity.

1.5 CONSUMER CONSERVATION

Although watering schedules are common to assist water conservation on the drinking water side of a utility, there are methods to practice consumer conservation on the wastewater side as well. While the typical shower head uses 2.5 GPM, a low flow shower head only uses 2.0 GPM while providing a similar pressure. Recent studies have indicated that 250 billion gallons of water could be saved if low-flow shower heads were installed in all American homes. For consumers unwilling to replace their current shower head, installation of an aerator will have a similar effect. By mixing water with air, the shower head makes a mist-like spray. Aerators can be installed in-line with a consumer's current shower head.

Similarly, low-flush toilets use 1.3 gallons per flush compared to 1.6 gallons for a regular toilet installed since 1992 and up to 7 gallons for toilets installed before then. Toilets are the biggest water drain in America, accounting for 30% of water for home use. By conserving through installation of low-flow shower heads and toilets, the City of Parker will save water while simultaneously limiting flow into the wastewater treatment plant.

The City of Parker could encourage installation of low flow equipment by offering aerators and/or refunds for purchase of low-flow shower heads or toilets. Educational materials regarding conservation can be found on the water management district website to provide to consumers in their bill or in the utility office. By providing such material to consumers, the utility can pass good habits onward.

Insert Figure 1.2

Figure 1.2. Gravity System Criticality Factor Prioritization Ratings.

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Criticality Factor Prioritization Ratings.

Dewberry

0 250 500 Feet

FIGURE # 1-2

LEGEND

- LiftStations
- Manholes

Gravity Mains Criticality Score

- 2
- 3
- 4
- 5
- 6

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Criticality Factor Prioritization Ratings.

Dewberry

0 250 500 Feet

FIGURE # 1-2

LEGEND

- LiftStations
- Manholes

Gravity Mains Criticality Score

- 2
- 3
- 4
- 5
- 6

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Criticality Factor Prioritization Ratings.

Dewberry

0 250 500 Feet

FIGURE # 1-2

LEGEND

- LiftStations
- Manholes

Gravity Mains Criticality Score

- 2
- 3
- 4
- 5
- 6

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Criticality Factor Prioritization Ratings.

Dewberry

0 250 500 Feet

FIGURE # 1-2

LEGEND

LiftStations
Manholes
Gravity Mains
Criticality Score
2
3
4
5
6

Insert Figure 1.3

Figure 1.3. Force Main System Criticality Factor Prioritization Ratings.

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Criticality Factor Prioritization Ratings.

Dewberry

0 250 500 Feet

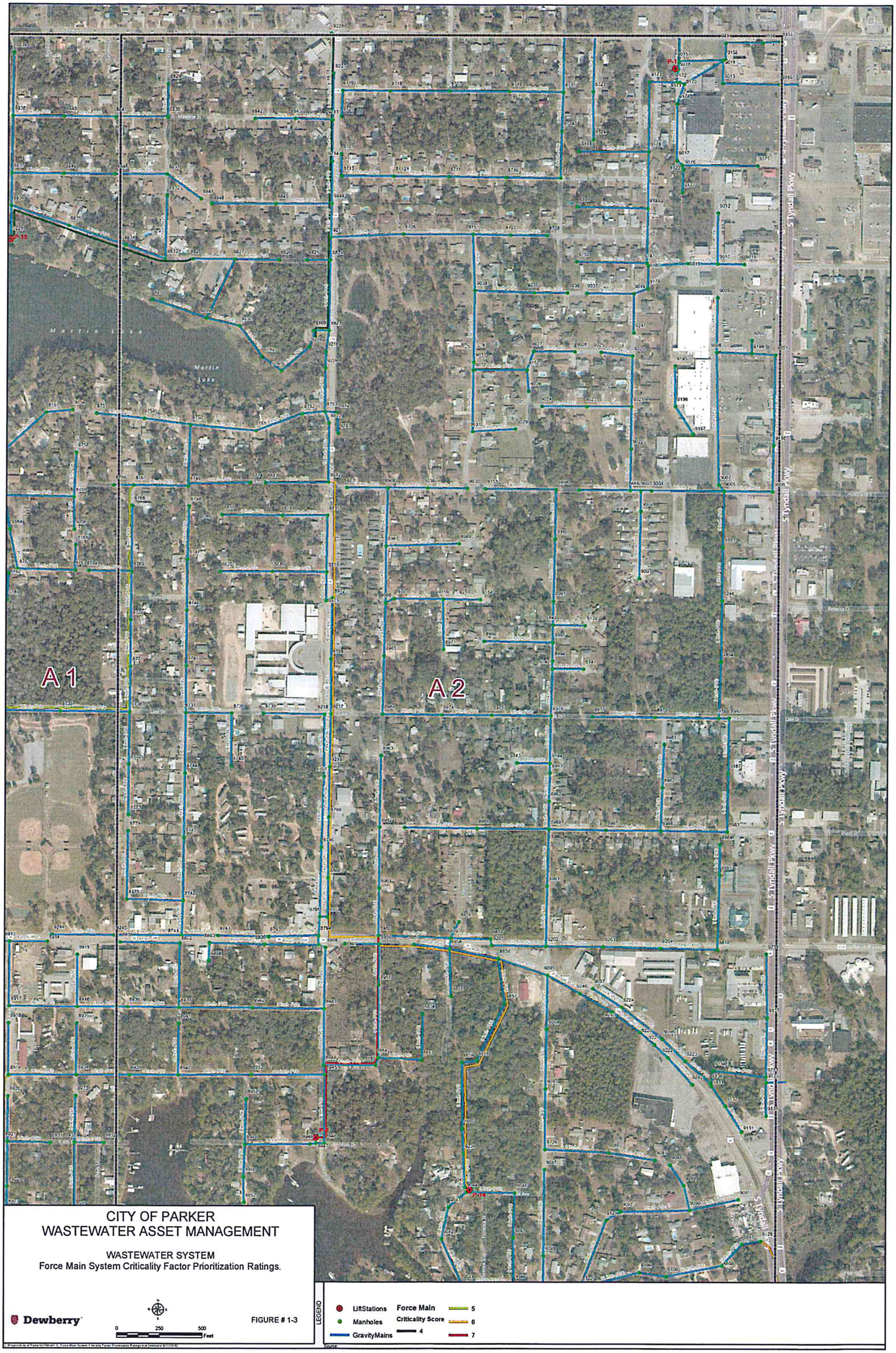
FIGURE # 1-3

LEGEND

- LiftStations
- Manholes
- GravityMains

Force Main Criticality Score

- 4
- 5
- 6
- 7



CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Criticality Factor Prioritization Ratings.

Dewberry

FIGURE # 1-3

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Criticality Factor Prioritization Ratings.

Dewberry

0 250 500 Feet

FIGURE # 1-3

LEGEND

- LiftStations
- Manholes
- GravityMains

Force Main Criticality Score

- 4
- 5
- 6
- 7

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Criticality Factor Prioritization Ratings.

Dewberry

0 250 500 Feet

FIGURE # 1-3

LEGEND

- LiftStations
- Manholes
- GravityMains

Force Main Criticality Score

- 4
- 5
- 6
- 7

Insert Figure 1.4

Figure 1.4. Gravity System Condition Factor Prioritization Ratings.

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Condition Factor Prioritization Ratings

Dewberry

FIGURE # 1-4

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Condition Factor Prioritization Ratings

Dewberry

FIGURE # 1-4

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Condition Factor Prioritization Ratings

Dewberry

0 250 500 Feet

FIGURE # 1-4

LEGEND

LiftStations
Manholes

Gravity Mains
Condition Score
3
4
5
6
7
10

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Condition Factor Prioritization Ratings

Dewberry

0 250 500 Feet

FIGURE # 1-4

LEGEND

LiftStations	Gravity Mains Condition Score	5
Manholes		6
	3	7
	4	10

Insert Figure 1.5

Figure 1.5. Force Main System Condition Factor Prioritization Ratings.

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Condition Factor Prioritization Ratings

Dewberry

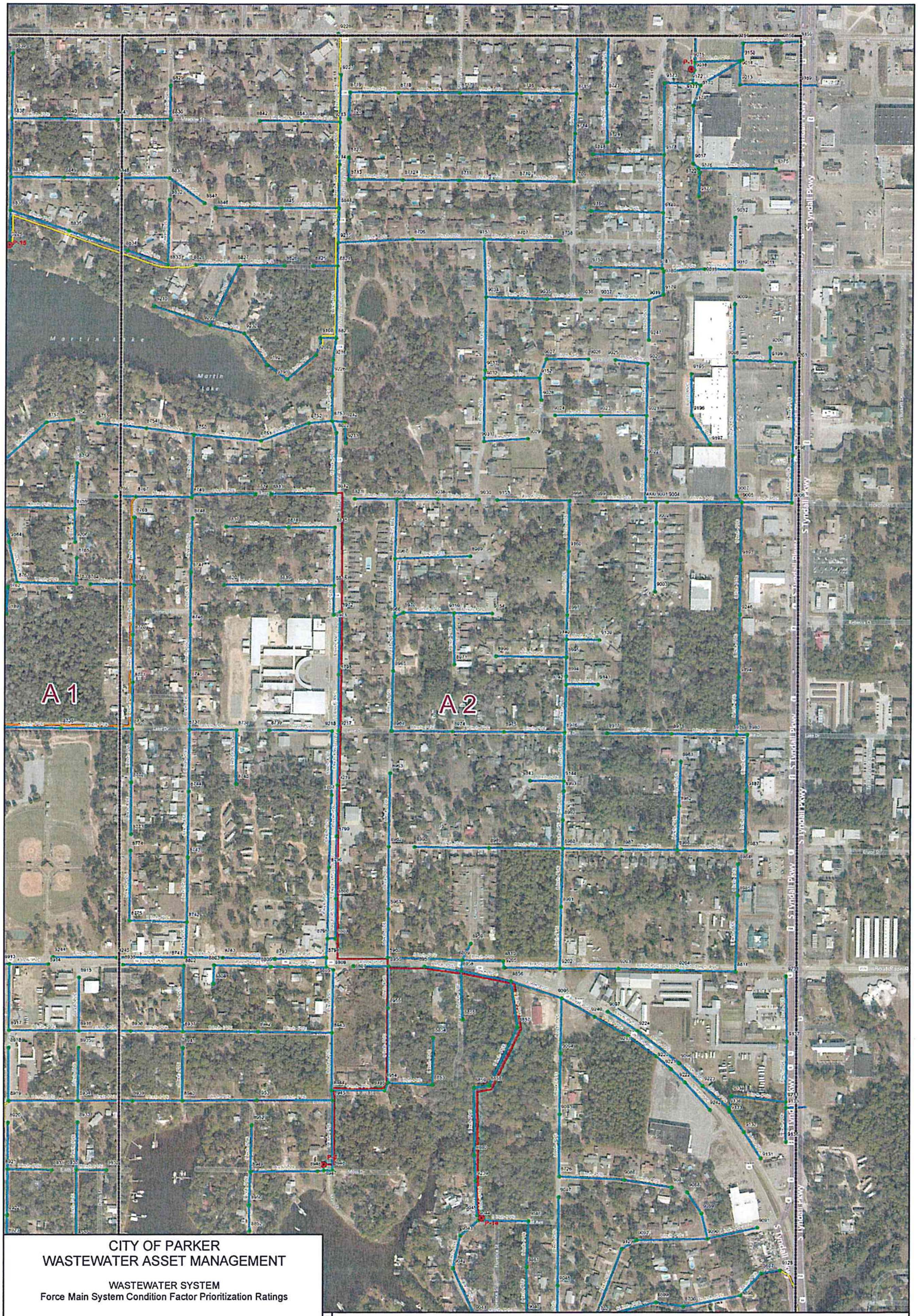
0 250 500 Feet

FIGURE # 1-5

LEGEND

LiftStations
Manholes
GravityMains

Force Mains
Condition Score
3
4
5
6
7



CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Condition Factor Prioritization Ratings

Dewberry

0 250 500 Feet

FIGURE # 1-5

LEGEND

LiftStations
Manholes
GravityMains

Force Mains
Condition Score
3
4
5
6
7

Source:

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Condition Factor Prioritization Ratings

Dewberry

0 250 500 Feet

FIGURE # 1-5

LEGEND

LiftStations
Manholes
GravityMains

Force Mains
Condition Score
3
4
5
6
7

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Condition Factor Prioritization Ratings

Dewberry

0 250 500 Feet

FIGURE # 1-5

LEGEND

- LiftStations
- Manholes
- GravityMains

Force Mains
Condition Score
- 3
- 4
- 5
- 6
- 7

Insert Figure 1.6

Figure 1.6. Gravity System Overall Prioritization Ratings.

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Overall Prioritization Ratings.

Dewberry

0 250 500 Feet

FIGURE # 1-6

LEGEND

LiftStations	Gravity Mains Recommendation	Frequent Condition Evaluation
Manholes	Low Priority	Mid Priority Program Rehab
	Regular Monitoring	High Priority Program Rehab

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Overall Prioritization Ratings.

Dewberry

0 250 500 Feet

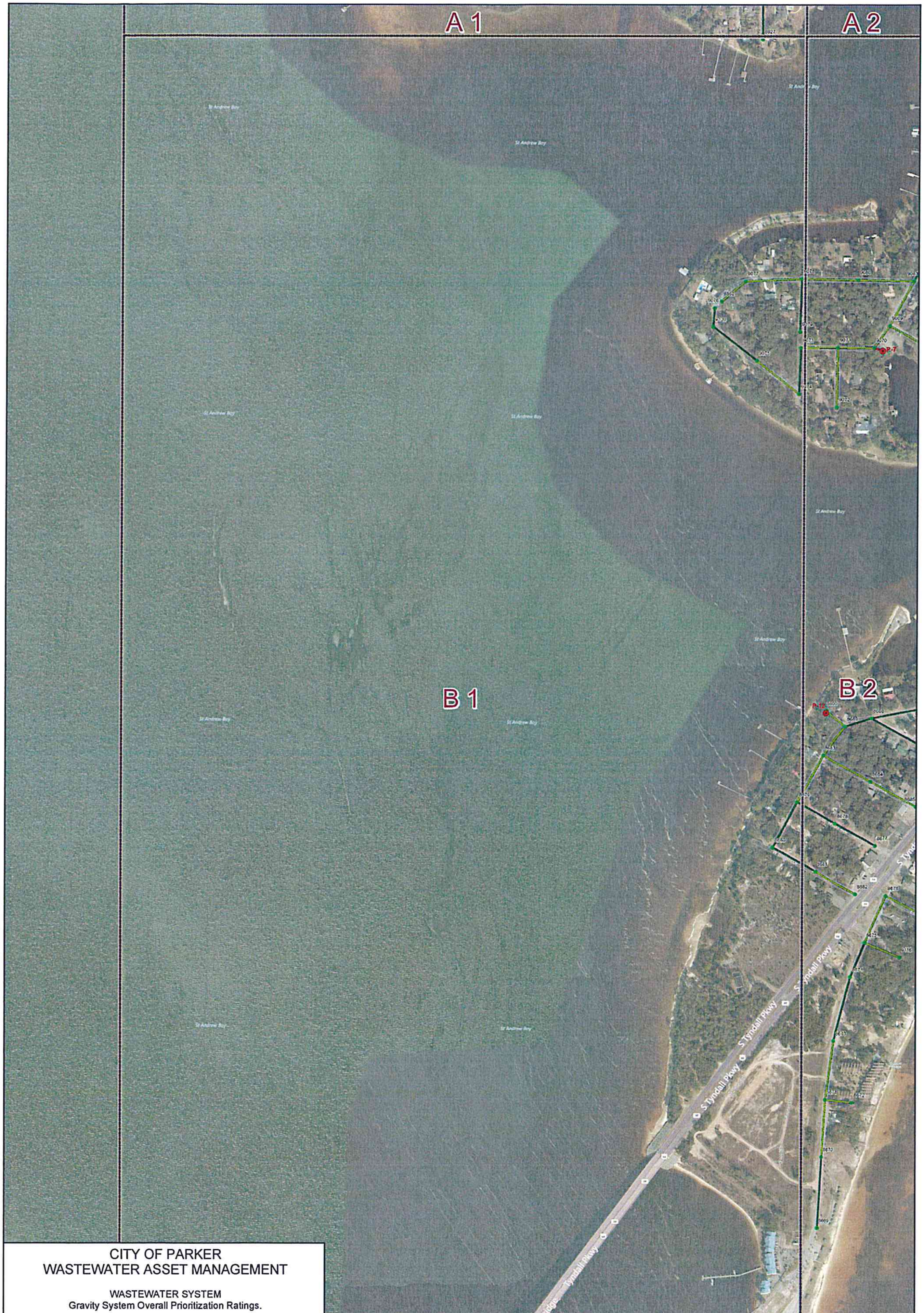
FIGURE # 1-6

LEGEND

- LiftStations
- Manholes

Gravity Mains Recommendation
- Low Priority
- Regular Monitoring
- Frequent Condition Evaluation
- Mid Priority Program Rehab
- High Priority Program Rehab

Source



CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Overall Prioritization Ratings.

Dewberry

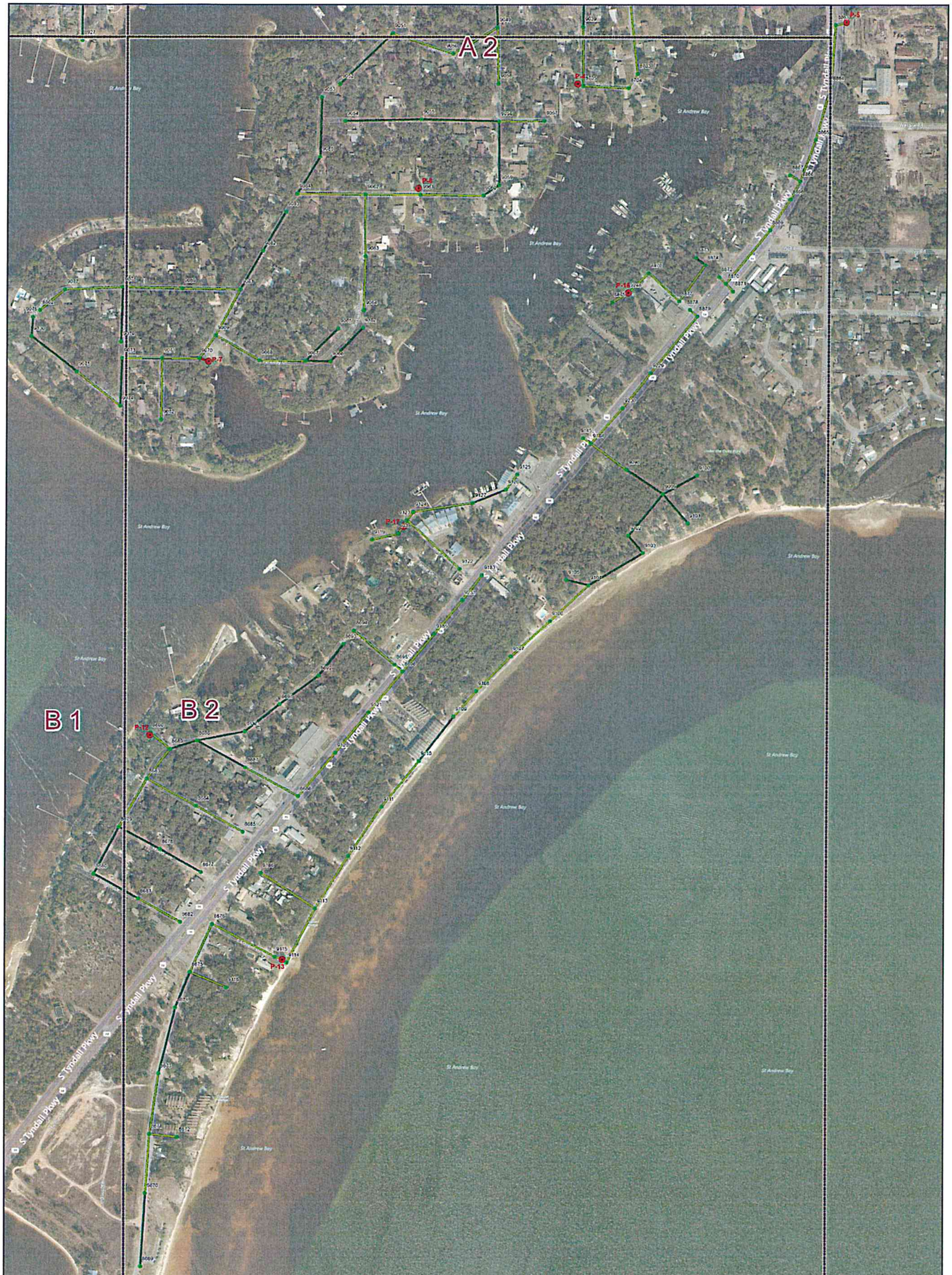
0 250 500 Feet

FIGURE # 1-6

LEGEND

- LiftStations
- Manholes

Gravity Mains Recommendation
- Low Priority
- Regular Monitoring
- Frequent Condition Evaluation
- Mid Priority Program Rehab
- High Priority Program Rehab



CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Gravity System Overall Prioritization Ratings.

Dewberry

0 250 500 Feet

FIGURE # 1-6

LEGEND

- LiftStations
- Manholes

Gravity Mains Recommendation
- Low Priority
- Regular Monitoring
- Frequent Condition Evaluation
- Mid Priority Program Rehab
- High Priority Program Rehab

Insert Figure 1.7

Figure 1.7. Force Main System Overall Prioritization Ratings.

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Overall Prioritization Ratings

Dewberry

0 250 500 Feet

FIGURE # 1-7

LEGEND

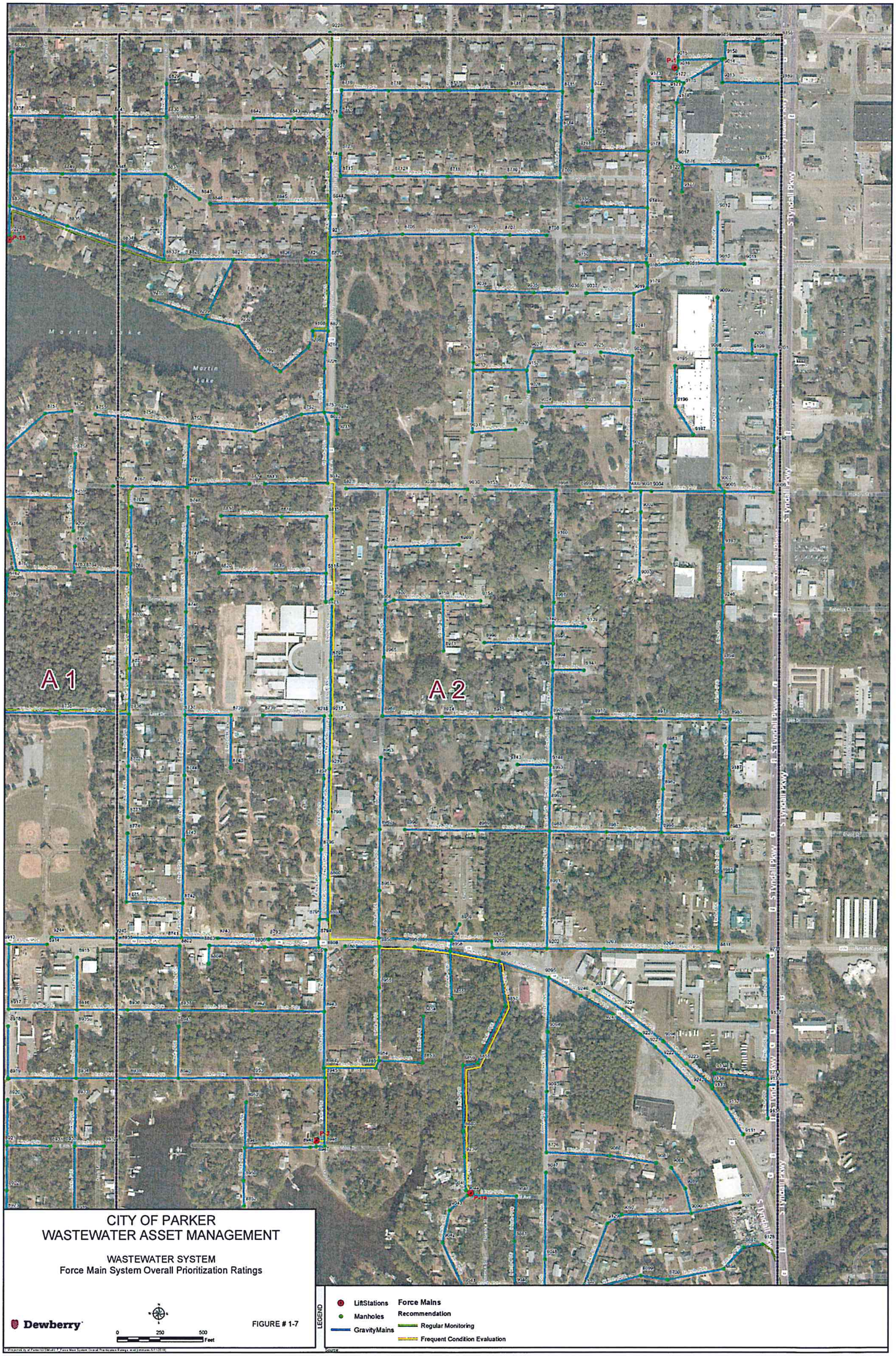
- LiftStations
- Manholes
- GravityMains

Force Mains

Recommendation

- Regular Monitoring
- Frequent Condition Evaluation

Source:



CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Overall Prioritization Ratings

Dewberry

0 250 500 Feet

FIGURE # 1-7

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Overall Prioritization Ratings

Dewberry

0 250 500 Feet

FIGURE # 1-7

LEGEND

- LiftStations
- Manholes
- GravityMains

Force Mains
Recommendation
- Regular Monitoring
- Frequent Condition Evaluation

Source

CITY OF PARKER
WASTEWATER ASSET MANAGEMENT

WASTEWATER SYSTEM
Force Main System Overall Prioritization Ratings

Dewberry

0 250 500 Feet

FIGURE # 1-7

LEGEND

- LiftStations
- Manholes
- GravityMains

Force Mains
Recommendation
- Regular Monitoring
- Frequent Condition Evaluation