NEW PORT RICHEY UTILITY SYSTEM MASTER PLAN UPDATE - 2023

Prepared for:

CITY OF NEW PORT RICHEY

Prepared by:

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1. EXECUTIVE SUMMARY

1.1. SCOPE OF STUDY AND PURPOSE

The City of New Port Richey (City) provides and manages water, wastewater, and reclaimed water systems for the City's service area residents. These utility systems rely on continual maintenance, improvements, and expansions to maintain the required level of service to the residents. A vital element the City uses for the planning, budgeting, and implementation of these changes to the utility systems is through the development of Water, Wastewater, and Reclaimed Water Master Planning. The most recent Master Planning efforts have not been updated for approximately 12 years. The purpose of this project is to update these utility plans to address growth, performance, age related infrastructure degradation, changing regulations, general improvements, and upgrades, etc. This report is presented in a similar format of the 2011 – Utility System Master Plan Update.

This Master Plan Update will address the extent and general condition of existing facilities, confirm the ability of these facilities to meet the current and future needs of the service area, and recommend upgrades and improvements as required. A specific emphasis was placed on the continued use and integration of all existing facilities, minimization of cost, and identification of the extent, timing, and cost of future infrastructure needs.

In addition, there are two new elements to this Master Plan Update which are (1) the investigation of potential interconnections with Pasco County's wastewater collection system to allow the City to divert wastewater flows in the event that the City's Wastewater Treatment Facility (WWTF) experiences temporary treatment limitations or disruptions, and (2) the evaluation of extending sewer service to communities within the City limits that are currently on individual septic treatment systems.

1.2. WORK PERFORMED

In order to develop the updated master plan and integrate it into the City's ongoing utility system program, Stroud Engineering first met with City staff to gather data, determine specific needs, document existing infrastructure conditions and issues, water and wastewater system performance, etc. In addition, site visits were made to major City facilities to both examine and further our understanding of each. We also obtained and reviewed copies of all relevant plans,

reports, studies, updated utility system maps, record drawings of previously completed projects, and other data describing the City's existing and planned utility system. These documents were evaluated with a specific emphasis on coordinating alternatives and recommendations of this updated master plan with those previously conceived and/or implemented.

The following is a tabulation of the relevant plans, reports, studies, records, maps, and other data we obtained, reviewed, and incorporated into the updated utility system master plan:

- Previous Utility Master Plans
- Current Comprehensive Plan
- Existing and Future Population Data
- Updated Utility System Maps
- Treatment Plant Operating Reports
- Treatment Plant Water Quality Data
- Water Supply Well Flow and Water Quality Data
- Regulatory Agency Permits, Reports, and Correspondence
- Interlocal Agreements
- Regional Authority Plans
- Service Area Maps
- Community Redevelopment Plan

1.3. ADEQUACY AND CONDITION OF EXISTING FACILITIES

1.3.1. WATER SYSTEM

The City’s potable water system consists of one active potable water well, one water treatment plant, three water storage tanks (including one elevated tank) and water distribution lines. The City-owned and operated William C. Maytum Water Treatment Plant (WTP) has a design capacity of 11.1 million gallons a day (MGD). Two water storage tanks are located at the plant including a 1.0-million-gallon tank for raw water storage and a 2.0-million-gallon tank for treated water storage. The City’s water distribution system consists of approximately 140 miles of water mains ranging in size from 1.5-inch to 30-inches in diameter, fire hydrants, meters, valves, backflow prevention devices and miscellaneous appurtenances. The water mains are constructed of various materials including cast iron, ductile iron, PVC, galvanized steel and asbestos cement. The water line

distribution system has main loops of 2-inch to 30-inch diameter and all fire hydrants are on a minimum of 6-inch fed lines.

The William C. Maytum WTP has two water supply sources: (1) Tampa Bay Water (TBW) and (2) a City owned well (City Well #5) located within the plant site. The primary water source supplied by TBW is raw water from the Starkey Wellfield, with average daily flows of 5.23 MGD. The Starkey Wellfield consists of 9 wells and has a design capacity of 23.5 MGD (Maximum Day) with a sustainable capacity (>5 days) of 8 MGD. City Well #5 is permitted for an annual average of 0.49 MGD and provides an average daily flow of 0.48 MGD.

Based on current and forecasted demands, the City's existing water supply, treatment, storage, and distribution system appears to be adequate to serve the City's needs for the foreseeable future.

1.3.2. WASTEWATER SYSTEM

The City’s central sewer collection system includes gravity mains that are approximately 79 miles of gravity sewer pipes ranging in size from 4-inch to 14-inch and include approximately 1,725 manholes. This gravity collection system feed wastewater to 74 lift stations that pump wastewater through approximately 28 miles of force mains, ranging in diameter from 2- to 24-inches, to the City’s wastewater treatment facility.

The wastewater treatment facility’s current permitted capacity is 7,500,000 gallons per day on an annual average daily flow (AADF) basis (State of Florida Domestic Wastewater Facility Permit #FL0127434). The current annual average daily flow at the treatment facility is approximately 5,913,000 gallons per day.

Based on the current flow projections, it is estimated that the facility’s current permitted capacity of 7.5 MGD AADF will not be exceeded for the foreseeable future.

1.3.3. REUSE SYSTEM

The City of New Port Richey’s existing reuse water system consists of approximately 24 miles of reclaimed water main line ranging from 2-inch to 36-inch in diameter. Reuse water originates at the City’s wastewater treatment facility and is governed by two land application provisions in the

wastewater facility's existing permit (#FL0127434). Land Application R-001 allows for 4,200,000 gallons of reuse per day (AADF) to be disbursed through a slow-rate public access master urban reuse system encompassing the Maytum Chambers Service Area while Land Application R-002 allows up to 7,500,000 gallons of reuse per day (AADF) to be transferred to the Pasco County Master Reuse System (PCMRS) for a combined capacity of 11,700,000 gallons per day.

As mentioned previously, the City of New Port Richey's Wastewater Treatment Facility produced approximately 5,913,000 gallons of reuse water on an average day. Included in that number, 1,693,000 GPD was used by the City and 4,220,000 gpd was transferred to the Pasco County Master Reuse System, both well below the permitted limits.

Based on the yearly average reuse demand, calculated from historical data, it appears the reuse system will be able to adequately serve the City without any change to the current permitted capacity.

1.4. MAJOR RECOMMENDATIONS

1.4.1. WATER SUPPLY SYSTEM

No recommendation currently as the City does not intend to increase water withdrawals from Well #5 located at the William C. Maytum Water Treatment Plant or other TBW water wells over the timeframe of this Plan.

1.4.2. WATER TREATMENT SYSTEM

Repair/Rehabilitation of Structures - It is recommended that the City replace the access hatches and have repairs made to the interior ceiling and concrete walls of the two ground storage tanks. The aerators have had some repairs made to the structure, but still need to replace the grout joints at the pipe penetrations.

Ground Storage Tank Piping Bypass - It is recommended to have a piping bypass and isolation valves installed to allow the storage tank to be taken offline for maintenance activities.

1.4.3. WATER DISTRIBUTION SYSTEM

Distribution Pipe Replacement - It is recommended that the City continue a prioritized program of pipe replacement. This includes the construction of new water transmission and distribution mains in areas of the existing water mains which are beyond their serviceable life. It also includes areas where A/C and galvanized (2-inch and above diameter) pipe material have been identified. Iron and steel lines located in coastal areas subject to saltwater inundation should also be given high priority. When being replaced, consideration should be given to upsizing line sizes to a minimum of 6-inch diameter to allow fire hydrants to be installed.

Service Pipe Replacement – The EPA's Lead and Copper Rule has changed in an effort to identify lead containing service lines and assist those customers with replacing those lead service lines. It is recommended the City continue with the process of identifying customer service pipe types and providing guidance and assistance to those residents that need to replace lead containing service lines.

Potable Water Loss Audit and Corrections – It is recommended the City continue to implement the measures identified in the water loss audit evaluation, including the tracking of water loss via water main breaks, changing out the bulk meters, resolving billing errors, along with other loss avoidance techniques.

1.4.4. WASTEWATER COLLECTION SYSTEM

Massachusetts Avenue Force Main Failures - It is recommended that the City conduct a thorough examination of the original contract documents and shop drawings for this force main project to verify the materials used for its construction and the possible cause of prior pipe failures.

Steel Dry Pit Lift Stations - It is recommended that the City upgrade the remaining steel dry pit lift stations in the following priority order as funding permits:

- III-G (Tanglewood at Maplewood Drive)
- II-B (S. River Rd. & Shaw St.)
- II-D-01 (Lafayette St. & Montana Ave.)

Cast Iron Force Mains - Due to the potential for failure, and the reduction in hydraulic capacity associated with older un- coated and/or un-lined cast iron force mains, these older cast iron force mains should be replaced with newer corrosion resistant (PVC, polyethylene) pipelines as funding permits. If possible, replacement of these force mains should be coordinated with lift station upgrades and a strategy of re-routing to optimize the utilization of newer force mains. For example, the City has recently extended its south side system of 20-inch, 18-inch, and 14-inch diameter force mains to the vicinity of Gulf Dr. and Magnolia Way. Replacement of the old 12-inch and 8-inch cast iron force mains utilized by Lift Stations Lift Stations II-B (S. River Rd./Shaw St.), II-C (Bridge Rd./N. River Rd.), and II-D (Bank St./Nebraska Ave.) could also be eliminated by constructing new force mains along Main Street, River Road, and South Road to connect to the force main transmission system near the WWTF.

Lift Station III-G Hydraulics - Lift Station III-G (Tanglewood at Maplewood Drive) functions as a master lift station, repumping flows from five or more smaller lift stations in the area. However, this relatively high-capacity lift station pumps considerable distance through an undersized 6-inch force main before it increases to 8-inches. It is recommended that this bottleneck be minimized or eliminated.

Additionally, after the LS III-G force main is upsized the combined 8-inch force main along High Street from Madison Street to Charles Street should be upsized and rerouted to connect to the larger transmission force main near Gulf Drive.

Force Main Interconnections - The ability for the City to divert a portion of the incoming flows from its wastewater treatment facility (4730 Main St.) due to operational issues at the plant or disruptions in the force main system could provide higher levels of reliability in the treatment facility operations and minimize the impacts of potential force main or process piping failures. As discussed previously, several potential system interconnects with Pasco County were identified. It is recommended that the City consider further evaluation of the following potential force main interconnections with the Pasco County system:

- Massachusetts Avenue Force Main
- Trouble Creek Road Force Main
- State Road 54 Force Main

1.4.5. WASTEWATER TREATMENT SYSTEM

Schreiber Treatment Unit - The Schreiber treatment unit provides a treatment capacity of 1.5 MGD and is currently limited in operational capacity due to deterioration of the mechanical equipment. Without the Schreiber process on-line, the plant is rated for a capacity of 6.0 MGD. Since the existing oxidation ditch units are operating as a single basin 2-stage nitrification/denitrification process, it is recommended that the City retrofit the Schreiber tank as a separate basin 2-stage denitrification process to better match the other treatment basins.

Headworks - The existing Headworks structure has over 40 years of active service and needs significant rehabilitation. While a new headworks structure would help alleviate some of the operational difficulties, the capital cost would be high and site space available for such a structure would be problematic. Instead of a new headworks structure, it is recommended that the City rehabilitate the existing headworks structure.

The existing odor control system should be upgraded to provide better air flow under the enclosed areas. As portions of the headworks are taken out of service, surfaces vulnerable to acid attack should be replaced with acid resistant materials and/or coatings.

Clarifiers - Since the existing primary clarifiers were constructed over thirty years ago, it is recommended that the City remove each clarifier from service and refurbish and replace the mechanical equipment and structural steel components of each as required.

Aeration/Mixing - It is recommended that the City implement the recommendations to convert its existing fixed speed aerators to a variable speed dual aerator/impeller configuration. Implementation of these recommendations will allow the plant operators better control of the existing treatment process, manage nitrification/denitrification and effluent nutrient concentrations, as well as a decrease in energy consumption associated with better mixing and dissolved oxygen control. While the City converted four (4) of the eight aerator motors to variable frequency drives, conversion of the other four aerator motors to VFD control is recommended. The installation of dual aerator/impeller configuration aerators is also recommended.

Return Activated Sludge/Waste Activated Sludge (RAS/WAS) Pump Station - In conjunction with the above modifications to aeration and mixing, recommended improvements relating to existing RAS/WAS pumping system include bypass piping directly to each oxidation ditch, with

automated isolation valves and magnetic meters at each pump to better control the feed rates to each ditch.

Dewatering System - The dewatering belt presses have been in service for over 20 years of continuous operation. The presses need replacement of belts, roller assemblies, hydraulic systems, drive units, electrical and control system, etc. It is recommended the City proceed with the refurbishment of the dewatering belt presses.

Structural Integrity - It is recommended that City systematically remove each reinforced concrete water holding tank structure from service to allow for cleaning and examination and replacement of construction/expansion joint material. Logically, this effort should take place while other recommendations (aerators, effluent weir gates, etc.) are being implemented.

Flooding Vulnerability - As the treatment plant is located within the flood zone, it is recommended that a detailed review of the facility be conducted with a focus on identifying process equipment, including pumps, electrical panels, control instrumentation, etc. that may be at risk due to flood events.

1.4.6. REUSE WATER SYSTEM

Expanded City Reuse System - It is recommended that the City continues to expand its existing reuse system in the City's service area as funding permits. Consideration should be given to including large parcels of land, neighborhoods with active irrigation practices, and new developments near existing reuse piping. Specific areas of expansion could include the Carlton Arms Apartment complex adjacent to the old Magnolia Gardens golf course site, North River area, West Grand neighborhood, Grey Preserve – Phase I park project, and new developments such as Newport Corners.

Backup Disposal - It is recommended the City continue to work with Pasco County to investigate options to improve the City's ability to convey its reuse water into the PCMRS, particularly during wet weather conditions.

Reuse Water Storage - The City owns approximately 14 acres of land, south of the wastewater treatment plant, for use as a reject and reuse water storage site. 9.0 million gallons of reject water storage was constructed at the time while provisions were made for adding an additional 15 million

gallons of reuse storage at a future date. It is recommended that City move forward with the construction of additional storage on this site to help assure a continuous supply of reuse water without interruption, and to maximize the volume of available water that is reused.

1.5. COST OF MAJOR RECOMMENDATIONS

Table 1-1 summarizes the potential cost of implementing the major recommendations described in this master plan update.

TABLE 1-1 – City of New Port Richey
Cost of Major Recommendations

	Description	(2024/2025) - (2028/2029)	(2029/2030) - (2033/2034)	(2034/2035) - (2038/2039)	(2039/2040) - (2043/2044)	Twenty Year Total
	Water Supply System					
	None					
	Water Treatment System					
1	High Service Pump Modifications	$ 100,913				$ 100,913
2	Elevated Storage Tank (Install Booster Pump Station, Mixer, & Controls)	$ 1,005,000				$ 1,005,000
3	Raw Water Tank Piping Modifications	$ 150,000				
4	Storage Capacity (Repair Existing 1 MG Raw Water Tank)		$ 360,000			$ 360,000
5	Storage Capacity (Repair Existing 2 MG Finished Water Tank)		$ 480,000			$ 480,000
	Water Distribution System					
1	Reliability/Redundancy/Interconnections (Little Road & Massachusetts Avenue)	$ 700,000				$ 700,000
2	Pipe Replacement (Includes Water System Improvements & Misc. Projects)	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 2,500,000	$ 10,000,000
3	Real Water Loss Audit & Corrections (Continue to Monitor & Fix Real Losses)	$ 200,000	$ 200,000	$ 200,000	$ 200,000	$ 800,000
	Wastewater Collection System					
1	Replace Steel Dry Pit Lift Station II-B (South River Rd.)	$ 600,000				$ 600,000
2	Replace Steel Dry Pit lift Station III-G (Tanglewood & Maplewood Dr.)	$ 600,000				$ 600,000
3	Replace and Upsize Force Main Serving Lift Station III-G (Tanglewood)	$ 450,000				$ 450,000
4	Replace Cast Iron Force Main Serving Lift Station II-B (South River Rd.)		$ 650,000			$ 650,000
5	Replace Cast Iron Force Main Serving Lift Station II-C (N. River Rd. & Bridge St.)		$ 650,000			$ 650,000
6	Replace Cast Iron Force Main Serving Lift Station II-D (Bank St. & Nebraska Ave.)		$ 450,000			$ 450,000
7	Replace and Upsize PVC Force Main Along Massachusetts Avenue			$ 2,500,000		$ 2,500,000
8	Replace and Upsize Force Main Along High Street			$ 1,000,000		$ 1,000,000
	Wastewater Treatment System					
1	Schreiber Process Modification	$ 7,600,000				$ 7,600,000
2	Clarifier Rehabilitation		$ 990,000			$ 990,000
3	Oxidation Ditch Rehabilitation	$ 2,400,000	$ 500,000			$ 2,900,000
4	Filter Structure Rehabilitation	$ 1,800,000				$ 1,800,000
5	Chlorine Contact/Wet Well Structure Repair	$ 225,000				$ 225,000
6	Oxidation Ditch Piping Replacement		$ 450,000			$ 450,000
7	Miscellaneous Piping Repairs/Gravity System Modifications		$ 49,500			$ 49,500
8	Sludge Press Rehabilitation	$ 600,000				$ -
9	Splitter Box Piping Modifications			$ 577,500		$ 577,500
10	RAS Piping Modification		$ 300,000			$ 300,000
11	Headworks Structure Rehabilitation		$ 487,500			$ 487,500
	Reuse Water System					
1	Expand City Reuse System		$ 500,000	$ 500,000	$ 500,000	$ 1,500,000
2	Reclaimed Water Storage Tank (8.0 MG)			$ 7,000,000	$ 7,000,000	$ 14,000,000
	Total	$ 18,930,913	$ 8,567,000	$ 14,277,500	$ 10,200,000	$ 51,225,413

2. INTRODUCTION

2.1. PURPOSE

The City of New Port Richey (City) provides and manages water, wastewater, and reclaimed water systems for its' residents. These utility systems rely on continual maintenance, improvements, and expansions to maintain the required level of service to the residents. A vital element the City uses for the planning, budgeting, and implementation of these changes to the utility systems is through the development of Water, Wastewater, and Reclaimed Water Master Planning. The most recent Master Plan has not been updated for nearly 12 years. The purpose of this project is to update these utility plans to address growth, performance, age related infrastructure degradation, changing regulations, general improvements and upgrades, etc.

This Master Plan update will address the extent and general condition of existing facilities, confirm the ability of these facilities to meet the current and future needs of the service area, and recommend upgrades and improvements as required. A specific emphasis will be placed on the continued use and integration of all existing facilities, to minimize cost, and to identify the extent, timing, and cost of future infrastructure needs.

The following list are significant reference documents used to update this master plan with existing and forecasted information:

- *2030 – New Port Richey Comprehensive Plan* (Vrana Consulting Inc., March 2016)
- *Utility System Master Plan Update – 2011* (C & D Engineering Inc., October 2012)
- *2019 – NPR Community Redevelopment* (Kimley-Horn, March 2019)
- *Capacity Analysis Report* (Stroud Engineering Consultants, April 2022)
- *NPR 2024-2028 Capital Improvement Program* (City Staff, September 2022)
- *NPR FY2024 Annual Budget* (City Staff, September 2023)
- *NPR FY2018 Utility Revenue Sufficiency Analysis Update* (Stantec, February 2019)
- *NPR Potable Water Loss Audit – Phase I* (CHA Consulting Inc., March 2022)
- *BEBR Florida Estimated Of Population* (University of Florida, April 2020)
- *County/City Population Estimates and Tract Maps* (Census, 2020)
- *Office Of Economic and Demographic Research* (EDR, April 2020)
- *Regional Water Supply Plan* (SWFWMD, August 2001)
- *NPR Water Supply Facilities Work Plan 2013-2025* (Vrana Consulting Inc., February 2013)
- *NPR Vulnerability Assessment* (GHS Environmental, September 2024)

In addition, there are two new elements to this Master Plan Update which are (1) the investigation of potential interconnections with Pasco County's wastewater collection system to allow the City to divert wastewater flows in the event that the City's Wastewater Treatment Facility (WWTF) experiences temporary treatment limitations or disruptions, and (2) the evaluation of extending water and sewer service to communities within the City limits that are currently on individual septic treatment systems.

2.2. SCOPE OF STUDY

In order to develop the updated master plan and integrate it into the City's ongoing utility system program, we first met with City staff to gather data, determine specific needs, document existing infrastructure conditions and issues, assess water and wastewater system performance, and discuss specific needs already identified by staff. We then conducted site visits to major City facilities to both examine and further our understanding of each. We obtained and reviewed copies of all relevant plans, reports, studies, updated utility system maps, record drawings of previously completed projects, and other data describing the City's existing and planned utility system. These documents were evaluated with a specific emphasis on coordinating alternatives and recommendations of this updated master plan with those previously conceived and/or implemented. Upon completion of this background work, we were able to describe and evaluate the service area's characteristics and make recommendations regarding both short- and long-term needs, document existing problems associated with the City's utility systems, establish facility needs for a 20-year planning horizon, evaluate various alternatives to address identified system deficiencies, and describe recommended system improvements with their associated costs.

2.3. PRIOR UTILITY SYSTEM MASTER PLANS

Over the past 30 years, the City of New Port Richey has commissioned comprehensive plans for its water and wastewater facilities. In 1989 the first master plan was produced (*Water and Wastewater System Master Plan,* Dyer, Riddle, Mills & Precourt, Inc., June 1989). The purpose of this plan was to identify short- and long-term goals for the City's water and wastewater facilities and to provide a conceptual plan for a reclaimed water system for the effluent from the WWTF.

In 2002, the City had a reclaimed water system master plan update prepared (*Reclaimed Water Master Plan Update*, McKim & Creed, March 2002). At the time this master plan was prepared it was acknowledged that there was increasing pressure from the State of Florida and EPA to

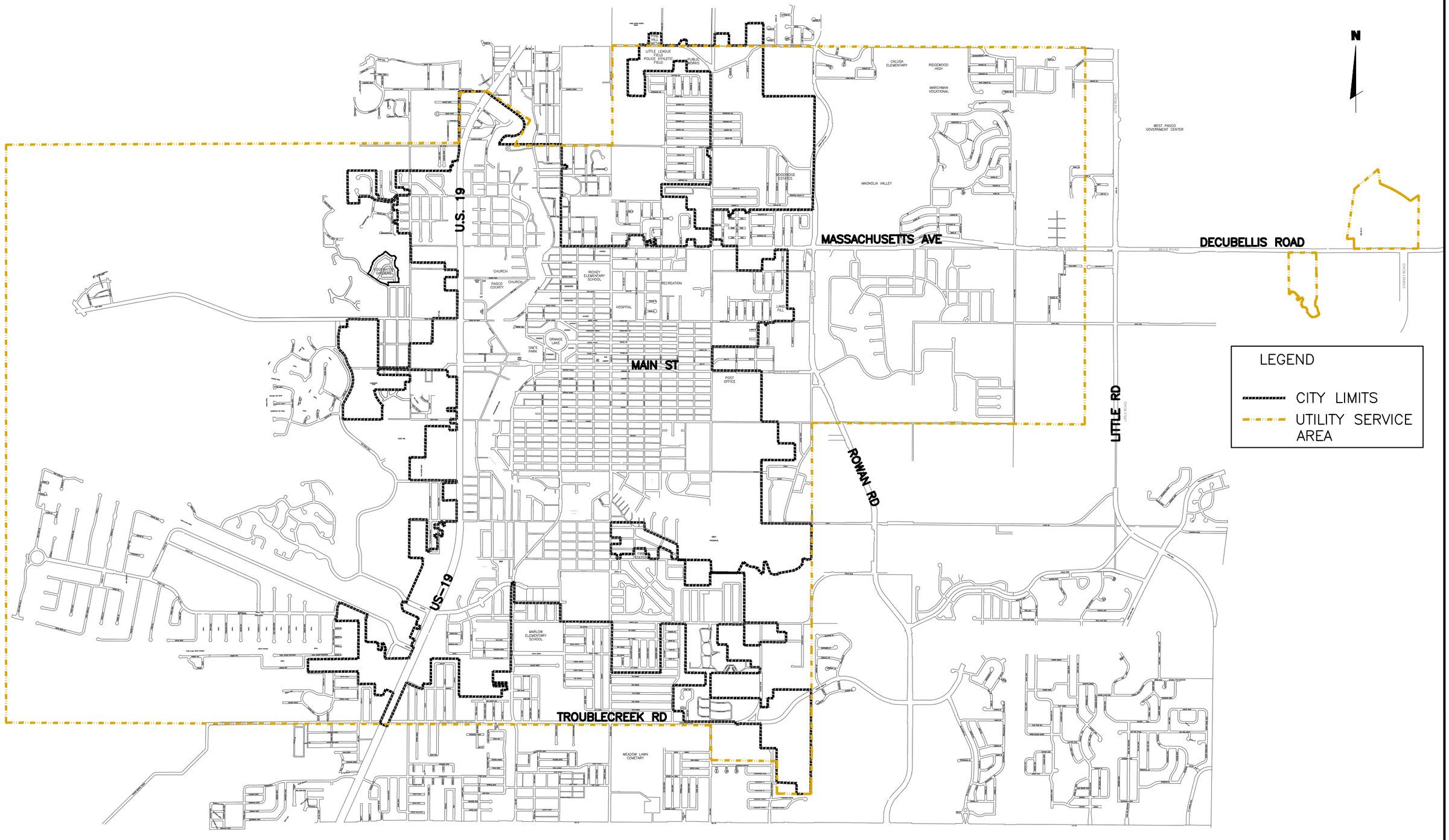
eliminate surface water discharges. The plan indicated that, at the time, the Florida Department of Environmental Protection encouraged the reuse of reclaimed water and land application and that it was very probable that new wastewater treatment facilities would be required to utilize some form of effluent reuse.

In 2012, a master plan update was completed (*Utility System Master Plan Update*, C&D Engineering, October 2012). This master plan update continued the evaluation of the water, wastewater, and reclaimed water systems within the City and identified short- and long-term goals for the City's water, wastewater, and reuse facilities. From that plan, the City focused on upgrading the sewer collection, pumping, and piping network as recommended.

2.4. SERVICE AREA

For many years, the City of New Port Richey owned and operated a municipal water and wastewater utility system for the benefit of its residents. In general, unincorporated areas in west Pasco County that developed during the 1950s and 1960s were served by private utility systems generally associated with each development. In the late 1970s Pasco County voted to create a county utility system by issuing revenue bonds and purchasing many of the larger private utility systems in west Pasco County. To avoid duplication of effort and assist with utility system planning, the City of New Port Richey and Pasco County entered into an interlocal agreement defining the City's utility service area. This service area was given the title Maytum Chambers Service Area incorporating the names of the principal negotiators from the City and County respectively. The Maytum Chambers Service Area, along with the City boundary, is shown on **Figure 2-1**. This service area remains the City's primary utility service area, though bulk service agreements exist between the City and adjacent utilities, such as Pasco County and the City of Port Richey.

Since the completion of the prior master plan update, the City has acquired the utilities for communities located within the Maytum Chambers Service Area that were previously provided with water and sewer services through private utility owners. These additional communities include Lakewood Villas, Orangewood Lakes, Silver Oaks, Barbara Ann Acres, Cypress Knolls, and New Port Corners.



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CITY LIMITS AND UTILITY SERVICE AREA BOUNDARY

FIGURE NUMBER
2-1

2.5. DEMAND PROJECTIONS

Beginning with the City's existing systems, and its associated service area, historical population and flow data were examined. Future service area flows and demands were then forecasted. This information was then used to identify supply, treatment, storage, pumping, distribution, collection, disposal, and related needs. Based on this analysis, alternative strategies have been developed to meet the projected needs of the system. These alternatives were analyzed, and recommendations are made addressing both long and short-term needs. Of specific interest will be the potential need for plant expansions and/or upgrades that may involve considerable planning, time, and cost to implement. The projections include the neighborhoods within the City that are served by septic systems with the intent to ultimately convert to sewer collection systems that will then flow into the City's wastewater system. The analysis was made of the probable impact these flows and demands have on the size and configuration of City facilities

2.6. HYDRAULIC ANALYSES

With service area flows and demands determined and examined, the next step was to update existing computer models of the City's water distribution, wastewater collection, and reclaimed water distribution systems. These computer models are digital representations of major elements of the City's water distribution, wastewater collection, and reclaimed water distribution systems such as pumps, pipes, junctions, tanks, flows, demands, etc. Hydraulic models for each City system have been developed using modeling computer software. With the hydraulic models completed and calibrated, alternative system scenarios of the existing and future conditions were simulated to identify infrastructure improvements to the system. The modeling results can be used to aid the City in the design of the wastewater pumping and force main system upgrades. While developing recommendations for the master plan, we worked closely with City staff to explore various scenarios of system growth, fire flows, system interconnections, new development and communities (e.g. septic conversions), and general system evolution. These computer models can be used over time to examine changes to the City's systems. For example, in the recent past these computer models have been used to assist in the design of wastewater lift stations, force mains, and water distribution system upgrades.

2.7. REGULATORY COMPLIANCE

The City of New Port Richey's water and wastewater treatment facilities are subject to the permitting requirements of various regulatory agencies. These ever-changing requirements have a significant impact on the size, type, configuration, and operation of these facilities. Over the tenure of previous master plans, the City has had to adapt to more stringent treatment requirements and most likely will have to do so in the future. To plan for such changes in the future, an evaluation was made of current facilities as it relates to both the existing and probable future regulatory climate. To accomplish this task, plant operators were consulted to determine the current status of each facility's regulatory status. Permits, Capacity Analysis Reports, regulatory correspondence, operating reports, and water quality data were obtained, reviewed, and evaluated. This information was used to examine existing treatment facilities, determine deficiencies, and evaluate strategies for correction.

2.8. ALTERNATIVES ANALYSIS

During this phase of the work, alternatives were developed as potential solutions to any needs and deficiencies identified. Possible alternatives will be discussed with City staff to determine feasibility, suitability, practicability, and consistency with City interests. The following is a tabulation of the primary considerations anticipated:

- Adequacy of Existing Treatment Facilities (capacity, treatment processes, expandability, etc.)
- Water Distribution System Configuration (pipe sizes, age of infrastructure, fire protection, redundancy, etc.)
- Wastewater Collection System Configuration (pipe sizes, pump stations, re-pumping, age of infrastructure)
- Reclaimed Water System Configuration (storage, service area, wet weather backup, etc.)
- Design Criteria for various CITY facilities
- Advantages, Disadvantages and Cost Alternatives

2.8.1. INTERCONNECTION EVALUATION

Should the City experience a catastrophic pipe failure at the wastewater treatment facility, there currently are limited options to store or divert incoming wastewater flows. In addition to the evaluation of the City's wastewater collection system, potential options were evaluated for the City to interconnect their wastewater force main system to the wastewater collection and force main

systems of Pasco County. The evaluation included coordination with the City and Pasco County to assess the conceptual interconnection locations, identify potential force main routes, and determine the ability or limitations of Pasco County's system to accept additional wastewater flows.

2.8.2. SEPTIC TO SEWER PLAN

The Septic to Sewer Plan prepared for the City (**Appendix I**) includes the estimated costs and probable flows for each phase of the project. While the Septic to Sewer Plan identifies estimated costs of the potential projects within the City, those costs are not included in this master plan update as the intent for funding those projects will be through solicitation of other federal and state grant and loan programs.

2.9. FINAL PLAN PREPARATION

At the conclusion of the above tasks, this final master plan was prepared. The final plan summarizes the information collected, alternatives considered, probable costs of the various alternatives and potential improvements, and provides recommendations for short- and long-term projects. Recommendations were coordinated with City staff during the report preparation to assure that recommended improvements are consistent with current City plans and programs.

3. WATER SYSTEM

3.1. BACKGROUND

For many years, the City of New Port Richey owned and operated a municipal water supply system consisting of dispersed wells throughout the City, each having self-contained treatment and pumping capabilities, delivering water to customers through a system of water distribution piping.

During the 1950s and 1960s the western portion of Pasco County experienced rapid development, most of which took place along the US-19 highway corridor. During these years most of the new public water supply development took the form of individual well and public water supply systems constructed in and around the new subdivisions constructed along this corridor. Unfortunately, over time the demand for potable water taken from these many well systems surpassed the sustainable yield of the aquifer system near the coast. Saltwater intrusion became commonplace in many of these coastal well systems, including the City's. Currently, only one of these wells remains in operation as the City's method of disinfection was changed, making the existing wells obsolete.

In order to secure a reliable water supply, the City of New Port Richey began developing an inland water supply system in the early 1970s. This new system consisted of a centralized wellfield, water treatment facility, and transmission piping to deliver finished water to the City's existing water distribution system. The new wellfield consisted of five wells located in what is now the western portion of the Starkey Regional Wellfield. The water treatment facility became the City's William C. Maytum Water Treatment Plant. The water transmission piping became a system of 30-inch diameter and smaller lines delivering treated water to various points of connection with the City's existing water distribution system. All these facilities remain primary elements of the City's current water supply system.

In the 1980s, after the creation of the West Coast Regional Water Supply Authority (now Tampa Bay Water), the New Port Richey and Pasco County participated in two major expansions of the Starkey Wellfield. The Phase-1 expansion consisted of 6 new wells resulting in a permitted capacity of 8.0 MGD annual average daily flow (AADF) and 15.0 MGD on a maximum day average daily flow (MDADF) basis. Phase-2 added four more wells increasing the wellfield's permitted capacity to 15.0 MGD (AADF) and 25.0 MGD (MDADF). This permitted capacity was divided between the City of New Port Richey and Pasco County based on a contractual entitlement which is summarized below.

Starkey Wellfield Entitlement

Entity	AADF (MGD)	MDADF (MGD)
New Port Richey	5.9	9.6
Pasco County	9.1	15.4
Total Capacity	15.0	25.0

In 1991 the West Coast Regional Water Supply Authority (now Tampa Bay Water), the City of New Port Richey, and Pasco County began constructing the North Pasco Regional Wellfield. This wellfield was to involve the phased construction of six (6) water supply production wells and associated water transmission lines linking it with the Starkey Wellfield. As with the Starkey Wellfield, the capacity of the planned North Pasco Wellfield was to be divided between the City of New Port Richey and Pasco County based on a contractual entitlement which provided another 1.5 MGD (MDADF) of groundwater to New Port Richey.

Based on the above entitlement structure, the City of New Port Richey's William C. Maytum Water Treatment Plant was permitted to treat 11.1 MGD on a maximum day average daily flow (MDADF) basis, by the Florida Department of Environmental Protection. Since that time, the North Pasco Regional Well Field is no longer in operation while the current permitted capacity of the plant is unchanged.

3.2. EXISTING WATER SYSTEM

3.2.1. GENERAL

The City of New Port Richey's water system is comprised of various facilities that have evolved over the years. In general, the City's system consists of six wells, one of which is in service, raw water entitlements through Tampa Bay Water, two cascade aerators, two ground storage tanks, high service pumps, one elevated storage tank, and many miles of water distribution lines ranging in size from 3/4-inch through 30-inches in diameter. **Figure 3-1** shows the extent of the City's existing water system.

3.2.2. WATER SERVICE AREA

As was described previously, the City of New Port Richey has an established a utility service area boundary (Maytum Chambers Service Area). This service area extends beyond City limits and has been used over the years to define areas likely to receive water and wastewater service from the City's utility system, as opposed to receiving water and wastewater service from Pasco County.

3.2.3. REGULATORY ENVIRONMENT

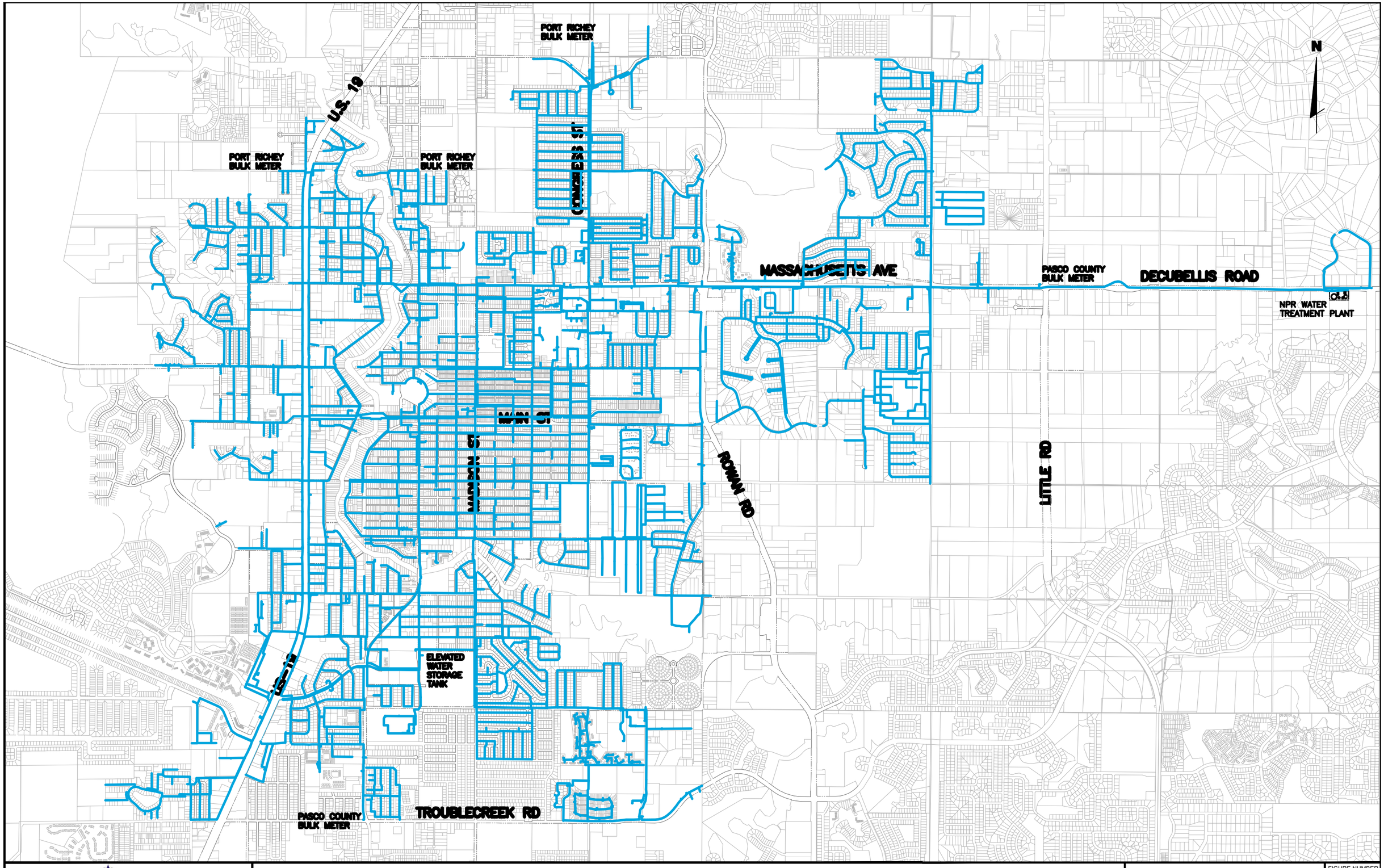
The City of New Port Richey's water system is operated under a permit issued by the Florida Department of Environmental Protection.

Groundwater is used as the source of supply for the City's water system. As such, the withdrawal and use of this water is regulated and permitted by the Southwest Florida Water Management District.

3.2.4. WILLIAM C. MAYTUM WATER TREATMENT PLANT

Raw well water is pumped directly from individual well pumps to the City's water treatment plant. Most of the raw water supplying the plant comes from the Starkey Wellfield operated by Tampa Bay Water, though a small amount of water comes from City Well No. 5 located onsite.

Raw water entering the plant is first treated by cascade aeration, to remove hydrogen sulfide, then flows by gravity to a 1.0 MG raw water ground storage reservoir. The treatment of water includes chlorination for primary disinfection, fluoridation, chloramination to maintain residual in the distribution system, then transfer to the 2.0 MG finished water ground storage reservoir. The finished water is then pumped into the City's distribution system for use. **Figure 3-2** shows the basic layout of the plant and the piping system connecting it to the wellfield and water distribution system. **Appendix A** contains design details of the major components of the City's water treatment plant.



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POTABLE WATER SYSTEM

FIGURE NUMBER 3-1

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WILLIAM C. MAYTUM WATER
TREATMENT FACILITY

FIGURE NUMBER
3-2

3.2.5. SCHOOL ROAD ELEVATED STORAGE TANK

The City's Elevated Storage Tank is a 500,000-gallon tank located at the southwest corner of School Road and George Street. The tank is connected to and "floats" on the distribution system providing pressure control, surge dampening, peak flow augmentation, and reserve water supply volume for the water system (**Figure 3-3**).

3.2.6. CITY WELLS

In the recent past, the City operated and maintained individual wells to supply the City with potable water. In 2004, when the William C. Maytum Water Treatment Plant was converted to chloramine disinfection, the City's remote wells were taken offline due to their incompatible free chlorine disinfection systems. The City now has a single groundwater well (Well No. 5) located at the water treatment plant. The City's current water use permit authorizes Well No. 5 to be pumped at an average annual daily rate of 490,000 GPD and a maximum monthly rate of 580,000 GPD. The remaining water supply is imported from Tampa Bay Water withdrawn from the Starkey Wellfield.

3.2.7. HISTORICAL FLOWS

In order to evaluate the City's water system, an analysis was made of historical flows from the City's William C. Maytum Water Treatment Plant (**Appendix B**). **Figure 3-4** shows the annual average daily flow (AADF) from these sources into the City's water distribution system. AADF is a commonly used indicator of sustained customer usage and its corresponding impact on water supply sources. As can be seen, since 2014 overall system demand has generally been constant and is well below the City's 5,900,000 GPD entitlement from the Starkey wellfield.

Figure 3-5 shows the corresponding maximum day average daily flow (MDADF) requirements of the City's water distribution system. MDADF is used to evaluate and design treatment, pumping, and distribution systems as it represents the high stress needs of a system. As with AADF, since 2014 overall MDADF demand has generally been constant and is well below the 11,100,000 GPD permitted capacity of the City's William C. Maytum Water Treatment Plant.

Beginning in May 2008, the City's William C. Maytum Water Treatment Plant began providing surplus treated water to Tampa Bay Water. Typically, these surplus flows are around 2.0 MGD.

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ELEVATED WATER
STORAGE TANK

FIGURE NUMBER
3-3

Figure 3-4
New Port Richey WTP Average Daily Flow

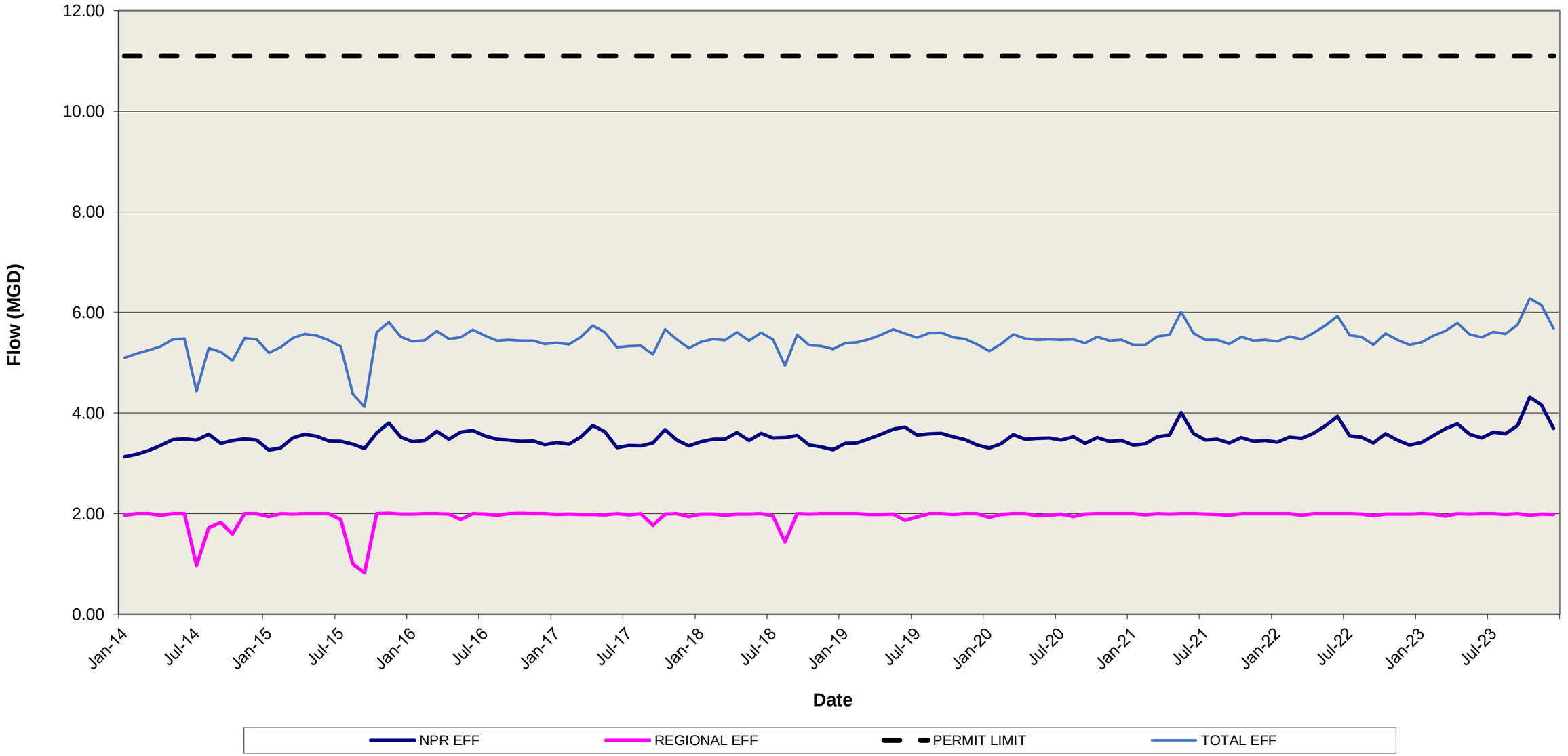
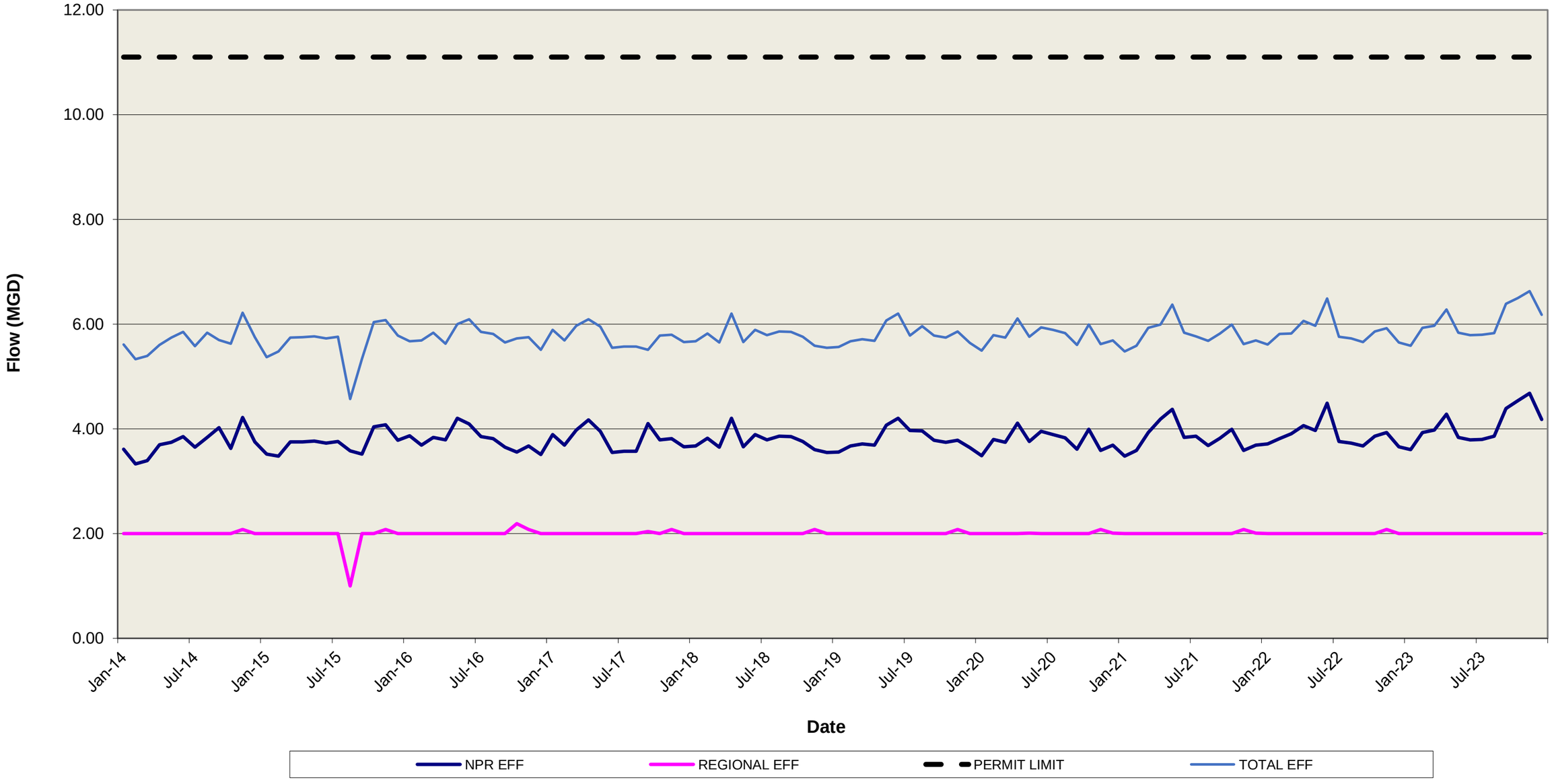


Figure 3-5
New Port Richey WTP Maximum Daily Flow



3.3. WATER SUPPLY SYSTEM

3.3.1. GENERAL

The City of New Port Richey's Water Supply System is typical of most water supply systems in Florida, in that it utilizes locally obtained groundwater as its primary source of water. In response to growth related competition for this resource and ever-changing regulatory mandates, the City's water supply system has taken on a regional character. The evolution of this regional character was described in the background information provided previously. Of importance to the reader is the fact that these influences continue to this day and greatly influence the quality and quantity of the City's potable water supply and the related treatment required. As such, the continued availability of this source of supply is of primary importance to the City.

3.3.2. CAPACITY

The City of New Port Richey's existing water supply system consists of five dispersed wells, and source of supply entitlements from Tampa Bay Water. Current annual average daily water demand is approximately 3,720,000 GPD, with a corresponding permitted water supply capacity of 6,390,000 GPD (5,900,000 GPD regional and 490,000 GPD City well). Wells that were part of the private water supply for Orangewood Lakes and Lakewood Villas were acquired by the City with the purchase of the water systems and have been deactivated and abandoned.

Based on current demands and demand trends, the City's existing water supply system appears to be adequate to serve the City's needs for the foreseeable future.

3.3.3. CONDITION OF EXISTING FACILITIES

The water supply facilities observed during the course of this planning effort appear to be in good condition and well maintained.

3.4. WATER TREATMENT SYSTEM

3.4.1. GENERAL

The City's Water Treatment System is similar to many similar systems throughout Florida, in that it utilizes high quality groundwater as its source of supply. Because of this high-quality source of supply, the City's raw water requires relatively minimal treatment prior to delivery to the consumer. Of importance to the reader is the fact that this minimal treatment requirement greatly influences the configuration of the water treatment plant, it's land requirements, and the overall cost of producing finished water. As such, the continued availability of this high-quality source of supply is of primary importance to the City.

3.4.2. CAPACITY

As was mentioned previously, **Appendix A** contains design details of the William C. Maytum Water Treatment Plant. The plant's current capacity, as was permitted by the Florida Department of Environmental Protection in 1995 (*Comprehensive Engineering Report Permitted Capacity Modification City of New Port Richey - Joseph A. Maytum Water Treatment Plant and Pasco County - Little Road Water Treatment Plant*, C & D Engineering, Inc., 1995), is 11,100,000 MGD based on a maximum day average daily flow (MDADF) basis. The City's current maximum day demand is approximately 4,680,000 GPD, not including the water treated and supplied to the regional system. Based on current demands and demand trends, the City's existing water treatment capacity appears to be adequate to serve the City's needs for the foreseeable future.

3.4.3. CONDITION OF EXISTING FACILITIES

Although functional portions of the City's water treatment plant date back to the 1970s it is evident from our site visits to the plant that the facility is well run, properly maintained, and generally in good condition. Over the years, through a combination of upgrades and replacement of equipment, the City has continually maintained the condition of this facility to a high standard.

3.4.4. OBSERVATIONS

Rehabilitation of Treatment Plant Structures

As was mentioned previously, City staff provide operation and maintenance of the treatment plant equipment and structures. Due to the age of some of the concrete structures (ground storage tanks, aerator structures) there is a need for some level of rehabilitation and repair to enable continued long-term use.

Chemical Disinfection System

To provide safe drinking water throughout the distribution system the City disinfects the raw supply water by dosing sodium hypochlorite followed by ammonia hydroxide to create chloramines, which provide longer residual times within the distribution system. At the dosing location of the ammonia hydroxide, reaction with the chlorinated water creates a deposit of hard scale inside the pipe. This scale buildup ultimately reduces the water flow capacity through the pipe. The City's operations staff must periodically access the pipe and remove the hardened material. To reduce the occurrence of the scale development and the subsequent pipe cleanout operations, the City is changing the chemical dosing of ammonia hydroxide to ammonia sulfate.

3.5. WATER DISTRIBUTION SYSTEM

3.5.1. GENERAL

As was shown previously (**Figure 3-1**), the City's water distribution system generally includes the bulk of the Maytum Chambers Service Area. Significant out parcels are served by Pasco County at several locations in the south and east, including the recently purchased FGUA/Lindrick Service Corporation system in the southwest, and other private utilities to the east.

3.5.2. CAPACITY

In order to evaluate the hydraulic capacity, performance, and capabilities of both the existing and future water distribution systems, it is helpful to develop and utilize mathematical computer models of these systems. A computer model is a digital representation of an actual system of pipes, pumps, reservoirs, valves, etc. that allows one to simulate the performance of a given system, without actually operating the system. A digital computer program is then used to perform the

many calculations involved in simulating the hydraulic performance of a given system. During the preparation of this master plan we developed various models of New Port Richey's water distribution system and utilized Bentley Systems OpenFlows WaterCAD to perform the calculations and generate the desired reports for evaluation and analysis. Using the above, steady state analyses of both existing and future systems were performed. In these analyses the operating behavior of the various system components, under conditions of constant demand, were simulated to determine instantaneous system pressures, flow rates, head losses, velocities, etc.

We began our planning activities by first developing a computer model of New Port Richey's existing water distribution system. Our initial task was to determine the geometry of the major distribution system components. This was accomplished by researching GIS Maps, as-built drawings, conducting site visits, and interviewing New Port Richey staff members. Once this information was obtained and reviewed, the information was superimposed on a scale map of the City allowing us to quantify locations, lengths, elevations, etc. Once this mapping was completed, was imported into the WaterCAD software where the pipes and junctions (nodes) were subsequently labeled and provided with their relevant technical data such as length, diameter, elevation, etc.

3.5.3. DEMAND DISTRIBUTION

The final step in development of the model involved assignment of demands to appropriate nodes within the system. Existing total system flows were obtained from water plant operating reports. However, it was necessary to approximate the spacial distribution of this total flow throughout the distribution system. To accomplish this task, census block data was used to distribute demand data between the various model nodes.

3.5.4. MODELING RESULTS

After demands had been assigned to each node of the model distribution system, a steady state analysis of the network was performed. The modeling results were compared to known system pressure and flow readings to determine if the model results closely matched actual operating conditions. Following this initial calibration, numerous operating scenarios were modeled in order to evaluate the effects of things like fighting fires at different locations in the City.

Appendix C contains the detailed results of the modeling effort. The following are some of the noteworthy results of the modeling effort.

- Due to the relatively long distance from the high service pumps at the William C. Maytum Water Treatment Plant and customers west of US-19, the importance of the City's elevated storage tank on School Road can be readily seen.
- Numerous very small diameter and dead-end pipes within the existing water distribution system reduce the overall supply capacity, redundancy, and efficiency of the system, particularly under fire flow conditions.

3.5.5. CONDITION

Because the City's water system has evolved over many years, the age, condition, and materials used for construction vary considerably throughout the system. In general, newer construction materials are more durable, resist corrosion better, and leak less. During the course of this study, when preparing system maps and computer models, the size and extent of suspect water lines constructed from asbestos cement, galvanized steel, unlined cast iron, and thin-walled PVC were revealed. Asbestos cement pipelines tend to be brittle, inflexible, and subject to failure due to differential settlement. Galvanized steel pipe tends to corrode, both internally and externally, especially in coastal area subject to saltwater inundation. Similarly, older cast iron pipe is subject to internal and external corrosion, if not constructed with protective internal and external coatings. Thin-walled PVC pipes, though corrosion resistant, are prone to premature failure due to fatigue brought on by pressure fluctuations and through differential settlement.

3.5.6. OBSERVATIONS

Service Pipe Replacement

In addition to the City's distribution pipe replacement efforts, changes to the EPA's Lead and Copper Rule requires water system owners to prepare an inventory of customer service pipe material types. These changes are made in an effort to identify lead containing service lines and assist those customers with replacing those lead service lines. The City is in the process of identifying customer service pipe type and providing guidance and assistance to those residents that need to replace lead containing service lines.

Fire Protection

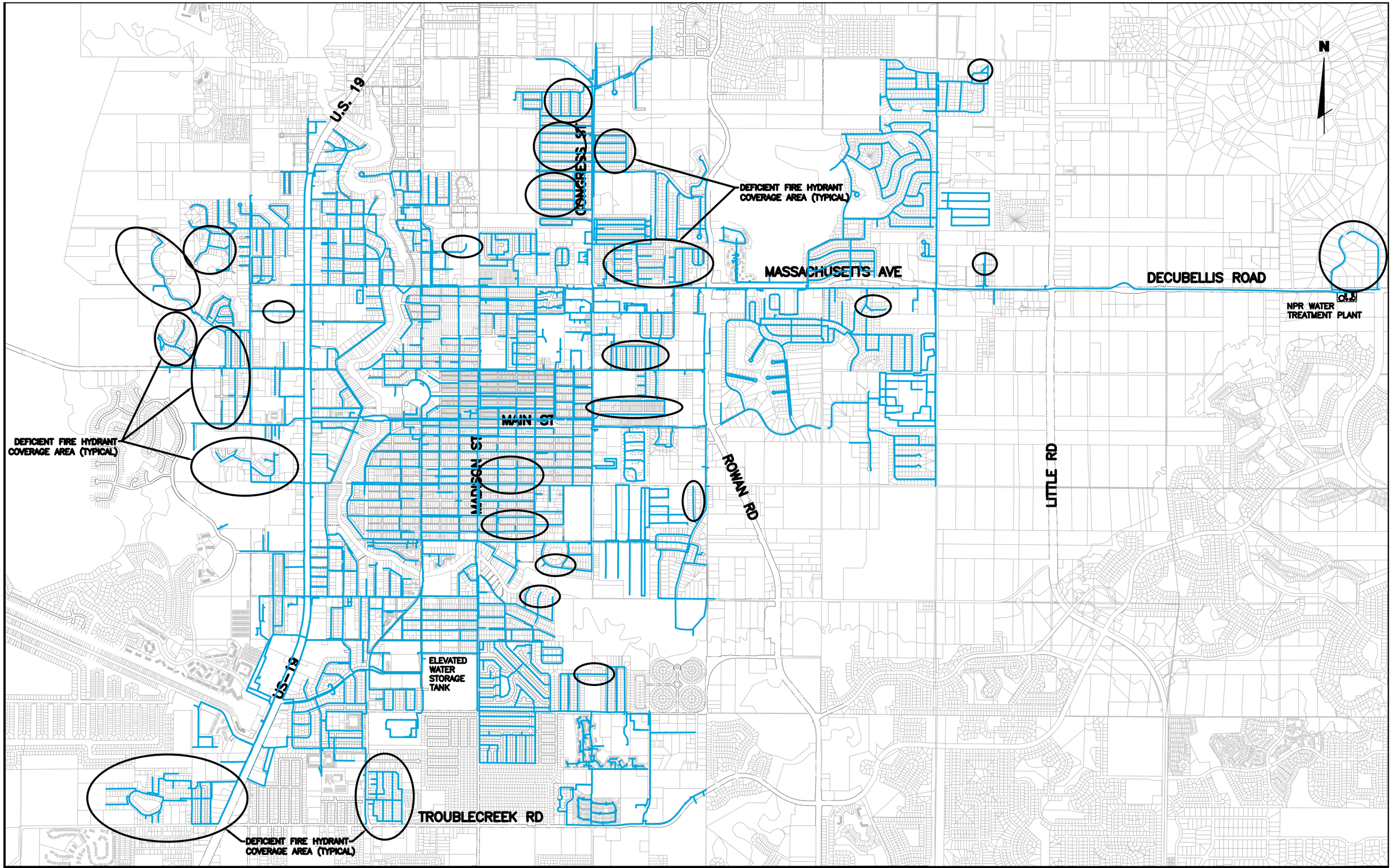
During preparation of system maps and computer models of the City's water distribution system, it became evident that some areas of the City's system are not adequately provided with fire hydrants. These areas generally correlate with portions of the system served with undersized (less than 6-inch diameter) water lines. **Figure 3-6** shows areas of the distribution where fire hydrants or fire hydrant spacing appear deficient.

School Road Elevated Storage Tank

Because the City's water treatment plant maintains a relatively constant system pressure, using variable speed pumping, the School Road Elevated Storage Tank tends to remain at a constant elevation resulting in its stored water becoming somewhat stagnant. This is a condition that may adversely affect water quality. A pending project will add high-service pumps and a mixer to eliminate the stagnant water condition.

Potable Water Loss Audit

SWFWMD conducts annual water audit reports of the City's potable water system. These audits provide accounting of water use quantities from various user categories, such as single family and multi-family dwelling units, residential irrigation, industrial and commercial units, and fire and other users. The SWFWMD audit conducted for 2020 identified high water loss through the City's water distribution system of approximately 34% of the total water supplied to the system. The reasons for the water loss volumes may be attributed to distribution system leakage, customer metering inaccuracies, unauthorized consumption, and systematic reporting errors. Average water loss for water systems District-wide was approximately 10%. The City hired a consultant to provide a review of the water audit, evaluate the City's metering and billing methods, identify any probable categories where losses are occurring, and provide recommendations to remediate the water loss (*Potable Water Loss Audit – Phase 1 Memorandum*, CHA Consulting, March 2022). In addition to this consultation, the City is moving forward with the tracking of water loss via water main breaks, changing out the bulk meters, installing smart meters, along with other loss avoidance techniques. As a result of these actions by the City, the 2023 audit showed improvements, with a water loss of approximately 28%.



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DEFICIENT FIRE HYDRANT COVERAGE AREAS

FIGURE NUMBER
3-6

3.6. FUTURE CONDITIONS

3.6.1. FUTURE FLOWS

As shown on **Figures 3-4** and **3-5**, in recent years City water demands have been essentially constant. The historical data suggests the City is not likely to experience significant increases in demands in the near future, which the addition of the communities of Lakewood Villas, Orangewood Lakes, Silver Oaks, Barbara Ann Acres, Cypress Knolls, and New Port Corners.

Starting in 2008, corresponding with the installation of new facilities at the water plant by Tampa Bay Water, there was an increase in both the maximum daily and average daily flows of treated water leaving the William C. Maytum Water Treatment Plant. By agreement, these flows are to be taken from surplus capacity not needed by the City. Consequently, these flows do not diminish the City's available capacity for its own needs.

3.6.2. POTENTIAL PROBLEMS

Based on the previously described water demand analysis, and the capacity of existing facilities, it appears the City will not have problems associated with increasing demands in the foreseeable future. Should the City alter this trend by adding new bulk customers and/or service areas, the potential impacts of these changes on the City's system can be evaluated, modeled, and appropriate upgrades addressed.

3.7. RECOMMENDATIONS

3.7.1. WATER SUPPLY SYSTEM

The City has not used the existing dispersed wells for decades. The renovation and implementation of their use into the City's distribution system would require well, pumping, piping, and water treatment improvements and modifications. These requirements would be costly and require additional staffing to monitor and operate those new treatment systems. Given the current water supply agreement with Tampa Bay Water and the interconnections with Pasco County water system, it is recommended that the City's dispersed wells should be abandoned and plugged. All sites could then be cleared and any marketable land sold.

3.7.2. WATER TREATMENT SYSTEM

Repair/Rehabilitation of Structures

Although the William C. Maytum Water Treatment Plant is in good condition, the age of the concrete structures shows a need for repair and rehabilitation. The two ground storage tanks need to replace the access hatches and have repairs made to the interior ceiling and concrete walls. The aerators have had some repairs made to the structure, but still need to replace the grout joints at the pipe penetrations.

Ground Storage Tank Piping Bypass

The yard piping on the treatment plant site will not allow the bypassing of the raw water storage tank, which does not allow the tank to be taken offline for an extended period and keep the overall plant in operation. It is recommended to have a piping bypass and isolation valves installed to allow the storage tank to be taken offline for maintenance activities.

3.7.3. WATER DISTRIBUTION SYSTEM

School Road Elevated Storage Tank Mixing

It is recommended that pumps, piping, and controls be added at the School Road Elevated Storage Tank site to allow stored water to be exchanged periodically to eliminate stagnation.

Pipe Replacement

As was described previously, older portions of the City's water distribution system are constructed of asbestos cement, galvanized steel, unlined cast iron, and thin-walled PVC pipe. Over time, the City has systematically replaced these older pipelines based primarily on the frequency of failure. It is recommended that the City continue a prioritized program of pipe replacement as funding permits. Iron and steel lines located in coastal areas subject to saltwater inundation should be given high priority followed by asbestos cement pipes. When being replaced, consideration should be given to upsizing line sizes to a minimum of 6-inch diameter to allow fire hydrants to be installed.

4. WASTEWATER AND REUSE SYSTEM

4.1. BACKGROUND

For many years, the City of New Port Richey has owned and operated a municipal wastewater collection and treatment system. Originally, wastewater was collected in the downtown area and after receiving minimal treatment was discharged into the Pithlachascotee River near the Main Street Bridge. In the early 1960s the City embarked on a major expansion of its wastewater system including construction of a new wastewater treatment facility on West Main Street discharging its treated wastewater into Cross Bayou. This site is still used by the City for its wastewater treatment and reuse activities.

Over the years, since construction of the wastewater treatment plant on West Main Street, the City's wastewater treatment system has evolved in response to growth, changing environmental regulations, funding opportunities, and the general need for water resource conservation. Throughout this evolution, the City has commissioned and followed the recommendations contained in various facilities plans. These previous plans considered various treatment and disposal alternatives based on the City's location, regional setting, existing facilities, and the regulatory climate. These plans were discussed in detail in the 2011 Master Plan Update.

A summary of the WWTF historical expansion phases and major infrastructure improvements are shown in **Table 4-1**.

Table 4-1 – Summary of WWTF Expansion and Improvements Projects

Project/Expansion Phase	Description	Approximate Date of Completion
Initial Treatment Plant (West Main Street Location)	Circular Aeration/Clarification package plant	1963
Wastewater Treatment Plant Improvements	Treatment Capacity increased to 1.5 MGD; Expansion included Schreiber Aeration/Clarification treatment system	1983
Phase II - 3.0 MGD Wastewater Treatment Plant Expansion	Total treatment capacity increased to 4.5 MGD; Expansion included new Oxidation Ditches, Clarifiers, Filtration, Chlorine Contact Basin	1989

Phase III - 3.0 MGD Wastewater Treatment Plant Expansion	Total treatment capacity increased to 7.5 MGD; Expansion included new Oxidation Ditches, Clarifiers, Filtration, Chlorine Contact Basin, Sludge Thickening	1992
Phase 1 Reclaimed System Improvements	Improvements include new 2.0 MG Prestressed Concrete Storage Tank and High-Service Pump Station	1996
New Port Richey SCADA System Phase 1	Installation of Radio Telemetry at all City Lift Stations and WWTF	2001
Reclaimed Water/Reject Water Storage Facilities	Improvements include a 2.0 MG Reclaimed Water Storage Tank, two 4.5 MG Reject Water Storage Tanks, and Return Pump Station	2005
WWTP – Dewatering System Improvements	Improvements included new Belt Filter Presses and Sludge Loading Station	2009

4.1.1. **WASTEWATER SERVICE AREA**

The City of New Port Richey's wastewater treatment facility evolved as a Subregional facility. The term "Subregional" was used throughout the planning efforts of the time to describe this and other similarly sized regions within Pasco County that were intended to efficiently provide wastewater service to a large area without overlap and duplication of facilities. As a result of this, City's Subregional wastewater service area included areas outside of the City and the Maytum Chambers Utility Service Area (**Figure 2-1**).

Because of its regional nature, the City of New Port Richey's Wastewater Treatment Plant also receives flows, through pressurized force mains, from unincorporated areas of Pasco County and the City of Port Richey. The former FGUA wastewater utility system is located within the unincorporated area of Pasco County which they purchased in 2022. **Figure 4-1** shows this regional service area in relation to the City of New Port Richey's Wastewater Collection System.

CITY OF PORT RICHEY COLLECTION SYSTEM TO NPR WWTF

CITY OF NEW PORT RICHEY WASTEWATER TREATMENT FACILITY

PASCO COUNTY COLLECTION SYSTEM TO NPR WWTF

CITY OF NEW PORT RICHEY COLLECTION SYSTEM

RIDGE ROAD

MASSACHUSETTS AVE

MAIN ST

DECUBELLIS ROAD

LITTLE RD

ROWAN RD

TROUBLE CREEK RD

S.R. 54

US-19

N

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REGIONAL UTILITY SERVICE AREA BOUNDARY

FIGURE NUMBER 4-1

4.2. EXISTING WASTEWATER AND REUSE SYSTEM

4.2.1. GENERAL

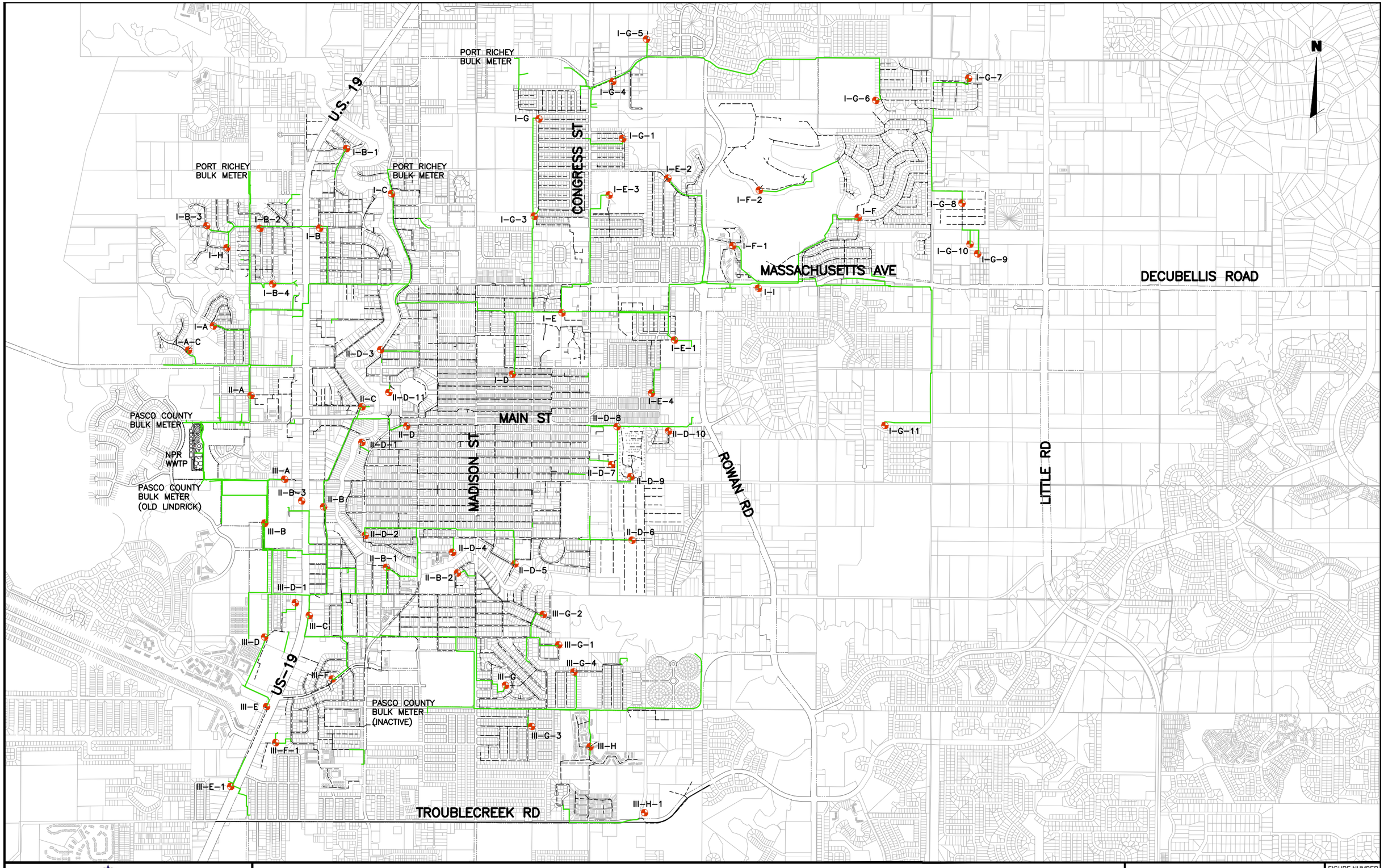
Generally speaking, the City's Wastewater and Reuse System is typical of many similar systems throughout Florida, in that it has evolved in response to ever changing regulatory mandates and related sources of funding. Consequently, the City's system is regional in character and emphasizes the beneficial reuse of the water it produces. Of importance to the reader is the fact that these influences continue to this day and involve potable water supply, wastewater disposal, and various other overlapping regulatory issues.

The current New Port Richey WWTF process design was based on an evaluation of historical wastewater strength (CBOD, TSS, TKN). Effluent limits were defined by permit limitations as stipulated in Florida Statute 62-600.420 Minimum Treatment Standards – Technology Based Effluent Limitations (TBELs) and F.S. 62-610, Part III Public Access Reuse and Part IV Rapid-Rate Land Application Systems.

4.2.2. WASTEWATER COLLECTION SYSTEM

Like most wastewater collection systems in Florida, the City of New Port Richey's consists of a combination of gravity sewer laterals, mains, and manholes collecting raw sewage from individual customers and delivering it to raw sewage lift stations which in turn pump the sewage through a system of pressurized force mains to the City's wastewater treatment plant. Virtually all the City's lift stations are equipped with radio telemetry equipment allowing remote monitoring and control from the City's WWTF.

Pasco County's portion of the service area delivers flows to the plant headworks with its own wastewater collection system. The former FGUA service area connects to the City's collection system at the south end of the plant site prior to a subaqueous crossing at Cross Bayou. Flows from Port Richey enter the City's wastewater collection system at several locations near the border between New Port Richey and Port Richey. **Figure 4-2** shows a more detailed view of New Port Richey's Collection System including the above referenced points of connection, major lift stations and force mains. **Appendix D** contains a summary of the City's lift stations.



STROUD Engineering Consultants	10503 Cyndee Lane Odessa, Florida 33556 C.A. License #29607 352.642.4412	FORCE MAIN AND GRAVITY SEWER SYSTEM	FIGURE NUMBER 4-2

4.2.3. WASTEWATER TREATMENT SYSTEM

The City's Wastewater Treatment Facility is a 7.5 million gallons per day extended aeration facility providing advanced secondary treatment suitable for public access reuse, based on annual average daily flow (AADF).

In the past, all effluent produced at the plant was discharged into Cross Bayou. In 1996 upgrades were made to the City's plant to allow for the discharge of all or a portion of the plant's treated wastewater into the City's Master Reuse System which is in turn interconnected with a large master reuse system operated by Pasco County.

The extended aeration with denitrification treatment process utilized at this plant is a form of activated sludge process which employs a long sludge age to maximize the conversion of nitrogen in the wastewater to its nitrate form. This process was originally selected in order to protect the Cross Bayou from low dissolved oxygen levels associated with the oxygen demand associated with this conversion of nitrogen.

Advanced secondary treatment refers to treatment levels beyond traditional secondary treatment processes. In the case of the City's wastewater treatment plant this term refers primarily to effluent filtration, which was employed to help protect Cross Bayou from high biochemical oxygen demands and suspended solids concentrations.

Figures 4-3, 4-4, 4-5, and 4-6 show the layout of the wastewater treatment facility and the design criteria can be found in **Appendix E**.

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WASTEWATER TREATMENT FACILITY - OVERALL

FIGURE NUMBER
4-3

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WASTEWATER TREATMENT FACILITY - NORTH

FIGURE NUMBER
4-4

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WASTEWATER TREATMENT FACILITY - SOUTH

FIGURE NUMBER 4-5

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WASTEWATER TREATMENT
FACILITY - REJECT STORAGE

FIGURE NUMBER
4-6

4.2.4. CITY REUSE SYSTEM

As was described previously, beginning in 1996 upgrades were made to the City's wastewater treatment plant to allow it to discharge of all or a portion the plant's treated wastewater into the City's Master Reuse System which is in turn interconnected with a large master reuse system operated by Pasco County. Subsequent projects extended the City's reuse distribution system to new areas and connected additional customers. **Figure 4-7** shows the general limits of the City's existing reuse system.

4.2.5. BACKUP REUSE SYSTEM

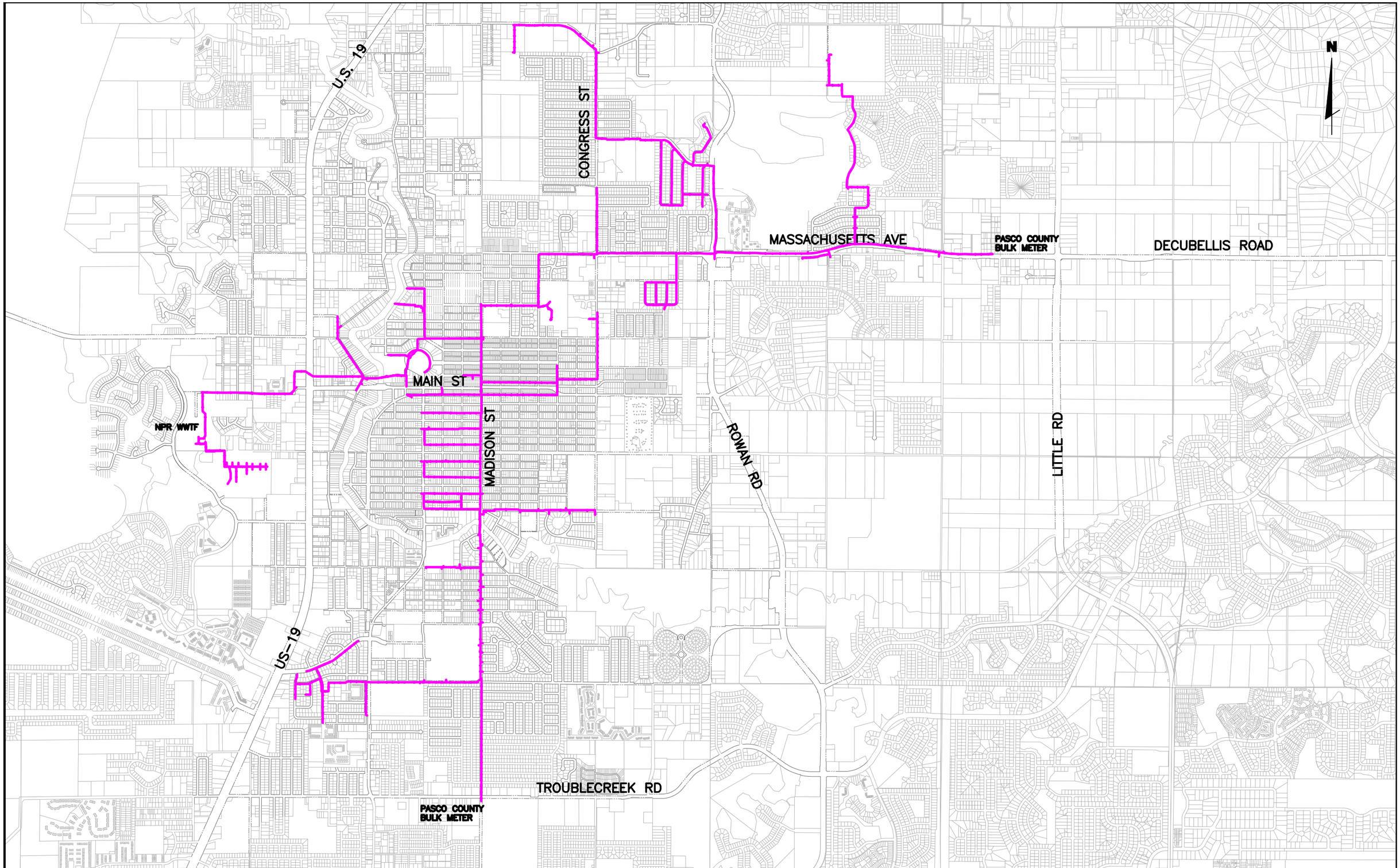
The City's reuse facility has on-site storage for approximately one half of the plant's daily production of water. During periods of low irrigation demand, excess water produced is discharged into Pasco County's Master Reuse System and in turn to rapid-rate infiltration basins (RRIBs) as required. These systems dispose of water by both infiltration and evaporation, plus they physically provide a significant volume of storage.

4.2.6. HISTORICAL FLOWS

In order to evaluate the City's wastewater collection, treatment, and reuse systems, an analysis was made of historical flows into and out of the City's wastewater treatment plant. **Appendix F** contains spreadsheets summarizing these data. **Figure 4-8** shows both the total annual average daily flow (AADF) treated by the wastewater treatment plant and the City's fraction. AADF is a commonly used indicator of sustained customer flow and its corresponding impact on treatment and disposal facilities. As can be seen, since 2014 overall flows have been generally constant with a 10-year average of 5.9 MGD. Of the overall flow, the fractions from the City, Pasco County, and the City of Port Richey have also remained relatively constant.

For comparison purposes, **Figure 4-9** illustrates reuse flows into both New Port Richey's Master Reuse System and Pasco County's Master Reuse System. As can be seen, on average the City reuses less than half of the raw sewage it receives from its customers. The balance of the reuse water is sent to Pasco County's Master Reuse System.

The current permit for The City of New Port Richey's Wastewater Treatment Facility (FLA127434), allows for 4,200,000 gallons of reuse per day (AADF) to be disbursed through a slow-rate public access master urban reuse system encompassing the city limits of New Port Richey as well as 7,500,000 gallons of reuse per day (AADF) to be transferred to the Pasco County Master Reuse System (PCMRS) for a combined capacity of 11,700,000 gallons per day. Currently, the City is well within these limits.



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RECLAIMED WATER SYSTEM

FIGURE NUMBER
4-7

Figure 4-8
New Port Richey WWTF Average Daily Flow

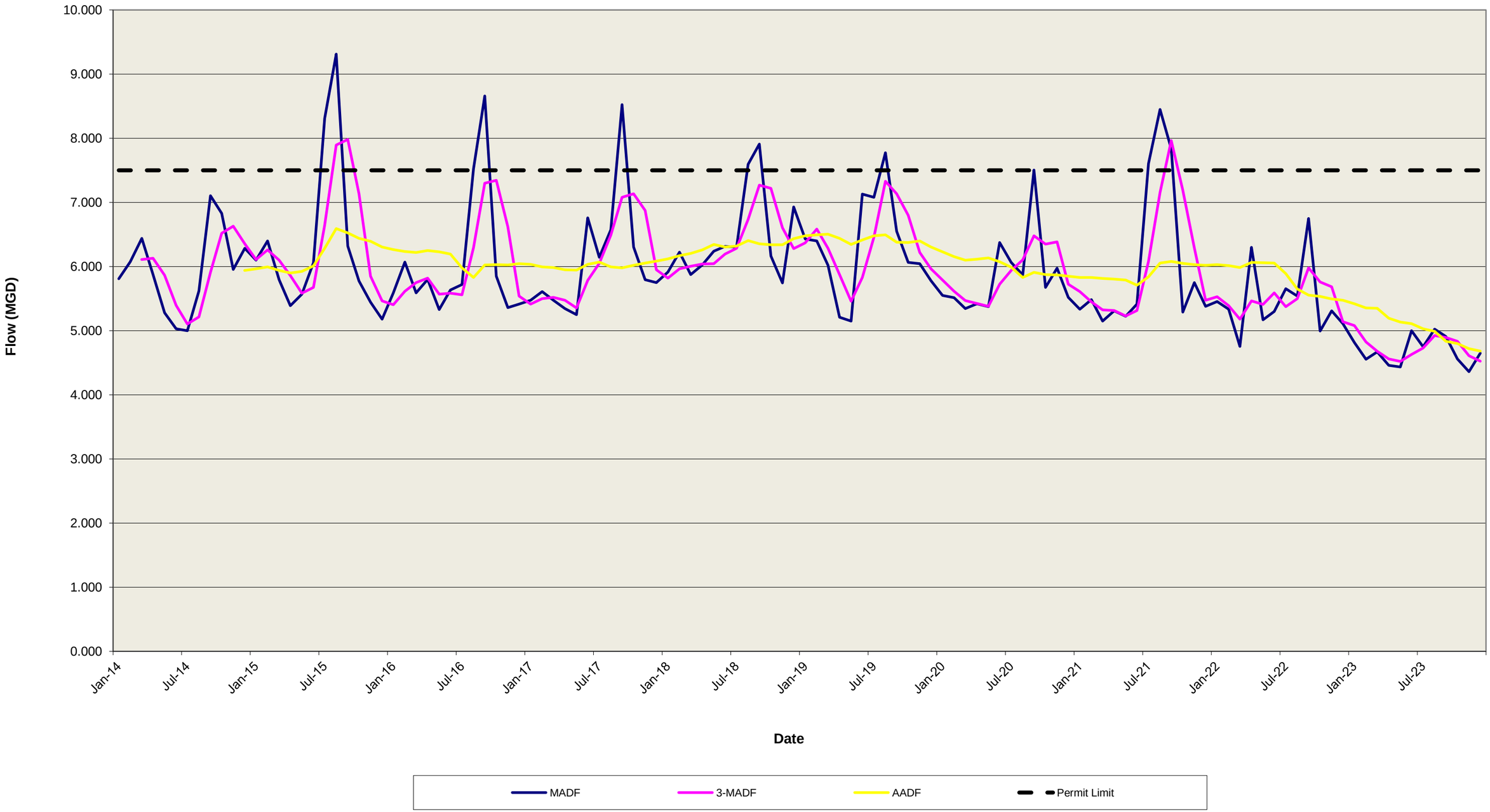
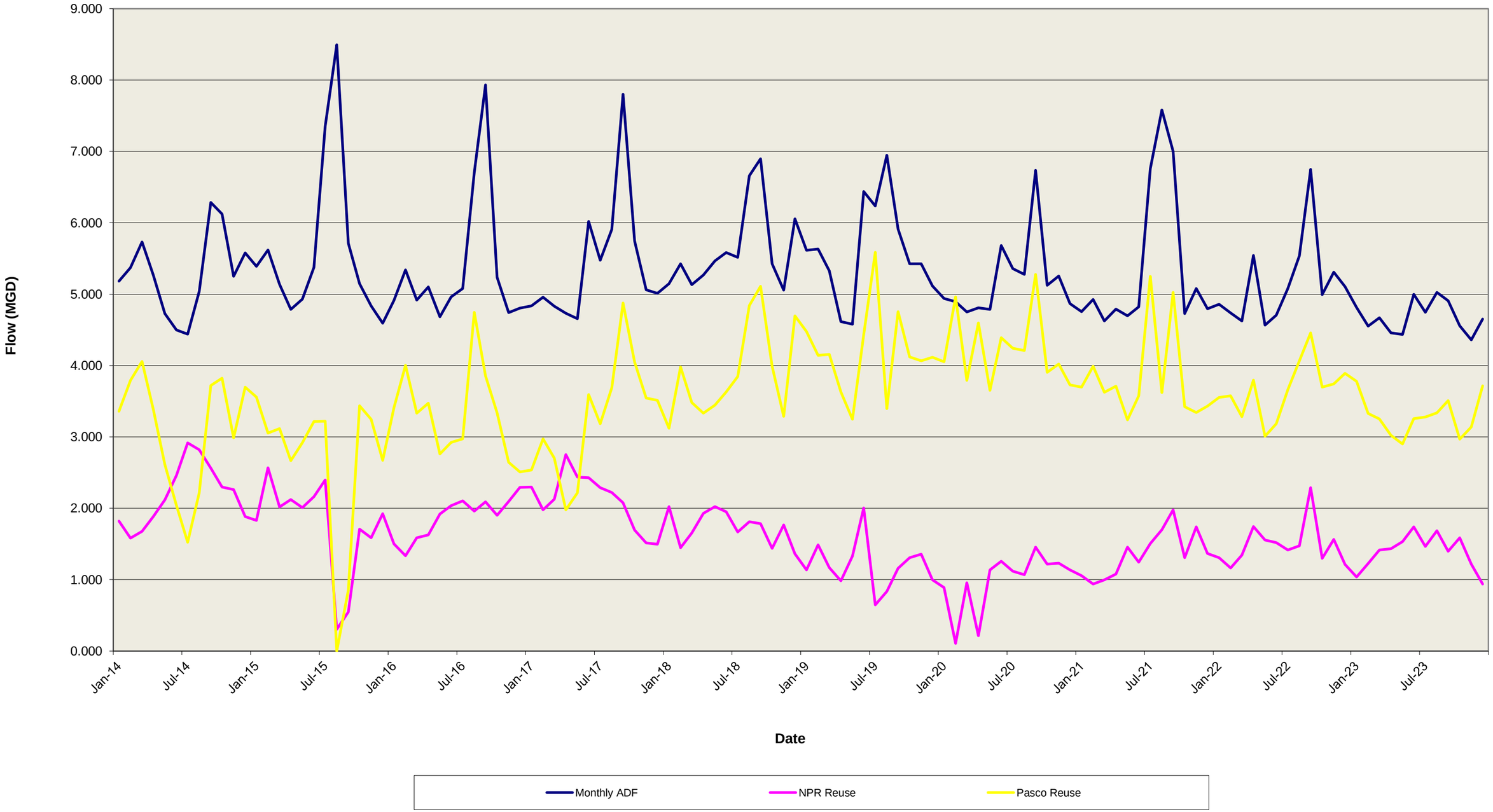


Figure 4-9
New Port Richey WWTF Reuse Average Daily Flows



4.3. REGULATORY CONDITIONS

The City of New Port Richey's wastewater collection, treatment, and reuse systems are regulated by the Florida Department of Environmental Protection (Permit No. FLA127434). With regards to the City's compliance with the wastewater permitting rules, there have been several issues that have developed due to changing regulations.

Surface Water Discharge - The use of the WWTF surface water discharge (SWD) has long been an issue with FDEP. At the time of the prior Master Plan Update, the surface water discharge was not included as a permitted disposal method. This condition was due to frequent copper and toxicity excursions from permitted limits, and therefore the City chose to eliminate discharge to surface waters. On October 7, 2005, a revision to the City permit was issued with new facility ID FLA127434, identifying the facility's disposal as land application only. The 2017 permit renewal application was submitted in September 2016 which noted that, during the wet season, the facility had been discharging through the inactive outfall structure. This was due to extreme wet weather events in which the Pasco Master Reuse System was not able to accept the City's effluent. Therefore, FDEP included an Administrative Order No. AO-005-SWD17 as part of the 2017 permit renewal, requiring the City to produce a study to evaluate reasonable potential for discharge to cause or contribute to nonattainment of Numeric Nutrient Criteria and provide recommendations regarding compliance. Ultimately, the study was completed with FDEP requiring a copper concentration limit of 3.7 µg/L in the SWD receiving waters. To comply with the copper limits the City authorized an evaluation (*Copper Removal Evaluation for Surface Water Discharge*, Stroud Engineering Consultants, February 2023) that provided recommendations for minor treatment modifications requiring chemical dosing of a copper precipitant to remove copper below the permit limits should the City need to dispose of effluent through the surface water outfall.

Reuse Effluent Disposal – In an effort to protect the health of the state's freshwater springs from degradation due to excessive nutrients entering their source waters, the State of Florida passed the Florida Springs and Aquifer Protection Act. The Act provides for the protection and restoration of Outstanding Florida Springs (OFS), which comprise 24 first magnitude springs, 6 additional named springs, and their associated spring runs. FDEP, under the auspices of the Act, has developed Basin Management Action Plans (BMAP) for all OFS as part of its statewide watershed management approach to restore and protect Florida's water quality. How the springs protection act ties into the City of New Port Richey is that the PCMRS, into which the majority of the City's treated effluent is delivered, includes reclaimed water users located withing the Weekie Watchee

BMAP. All WWTF's that discharge within the BMAP boundary are required to treat the wastewater to advanced treatment levels, the principal nutrient level of 3 mg/L of total nitrogen. There is currently no facility within Pasco County that provides that level of treatment. During the latest (2023) permit renewal process, FDEP included another Administrative Order No. AO-063SWD23 requiring the City to provide a proposal to the Department on how they plan to meet the new total nitrogen concentration limits. This same Administrative Order was attached to the Pasco County wastewater treatment facilities. There is no current resolution regarding the steps the City or County will have to take as the County is working with FDEP to identify options to comply with the BMAP requirements. This process is expected to take a few years to complete, at which time the City will have a better understanding of the steps they may have to take for any treatment facility modifications.

4.4. WASTEWATER COLLECTION SYSTEM

4.4.1. GENERAL

As was described previously, the City of New Port Richey's Wastewater Treatment Plant receives flows from a regional service area including areas of Pasco County (including the former FGUA/Lindrick Service Corporation) and the City of Port Richey. Pasco County's portion of the service area delivers flows to the plant headworks with its own wastewater collection system. The old Lindrick Service Corporation (now owned by Pasco County) connects to the City's collection system at the south end of the plant site prior to a subaqueous crossing at Cross Bayou. Flows from Port Richey enter the City's wastewater collection system at several locations near the border between New Port Richey and Port Richey.

4.4.2. CAPACITY

As done with the water distribution system, mathematical computer models of the City's wastewater collection system were developed. These computer models described significant portions of the City's system of pipes, lift stations, and discharge locations, allowing the performance of each system to be evaluated without actually operating each system. Bentley Systems OpenFlows WaterCAD was used to perform the calculations and generate the desired reports for evaluation and analysis.

Using the above models, steady state analyses of existing and future systems were performed. In these analyses the operating behavior of the various system components, under various conditions were simulated to determine system pressures, flow rates, head losses, velocities, etc.

4.4.3. MODELING RESULTS

Appendix G contains the detailed results of the modeling effort. The following are some of the noteworthy observations resulting from this modeling effort:

- Lift Station III-G (Tanglewood at Maplewood Drive) functions as a master lift station, repumping flows from five or more smaller lift stations in the area yet discharges through an undersized 6-inch force main for considerable distance. This 6-inch force main is a hydraulic bottleneck that restricts the capacity of this important lift station.

- Much of flow from the southeast quadrant of the City uses the same 8-inch force main west of Madison Street. This 8-inch force main is a hydraulic bottleneck that restricts the pumping capacity of Lift Station III-G.

- Lift Station II-D (Bank St./Nebraska Ave.) re-pumps water from a number of lift stations that are located considerable distance away. This configuration compounds the odor problem at Lift Station II-D and increases costs associated with re-pumping the same wastewater multiple times. Over time the City has added new force mains that are closer and offer hydraulically improved points of connection to several lift stations. Recently, the City connected Lift Stations II-D-02 (Lafayette St./Louisiana Ave.), II-D-04 (Dailey Ln.), and II-D-05 (Francis Avenue Park) to the 14-inch, 18-inch, 20-inch force main system south of the river and bypassed Lift Station II-D.

4.4.4. INTERCONNECTION EVALUATION

The City of New Port Richey accepts raw sewage from the residential and commercial customers within its service area, which transmits the wastewater flows to the City's WWTF through a large network of pressurized force mains. In addition to the City's customer base, the WWTF also accepts wastewater flows from unincorporated areas of Pasco County (including the purchased FGUA/Lindrick Service Corporation system) to the south and the City of Port Richey to the north. The flows from these contributing sources consume a significant portion of the plant's overall treatment capacity, with Pasco County's flows alone making up almost 43% of the total plant flows.

As the City's WWTF and force main infrastructure age, the dependence of the customer base on the single WWTF facility and dedicated transmission system, along with the lack of a redundant or alternate transmission system, becomes an important consideration. In the potential event of a catastrophic structure or piping rupture at the plant, or within the City's transmission system, the City's staff would have to expend considerable resources to contain any sewage spills and maintain service to the customers. Although this same concern exists within many municipalities, the potential ability to temporarily divert flows to an alternate WWTF or to a different transmission system in an emergency could provide substantial flexibility to the City's Operations staff, along with minimizing any environmental impacts, managing pump trucks, and disposal of the sewage.

The ability to divert wastewater flows in an emergency situation would require interconnected piping between the City's transmission system and the adjacent utility service areas. Although the County and City of Port Richey have transmission system piping outside of the City's service area, only the County offers a viable option for diversion of a significant volume of wastewater from the City's transmission system. As discussed previously, the Pasco County wastewater collection system along the US Highway 19 corridor contributes a significant portion of the wastewater flows to the City's WWTF. In addition, the County has large diameter force main piping in relatively close proximity to the City's transmission system. Based on a review of the County's utility atlas maps and discussions with the County's Wastewater System Maintenance Supervisor, there are three piping interconnect options that were determined to be most beneficial for both entities (**Figure 4-10**):

1. Massachusetts Avenue Force Main – This option consists of the installation a piping interconnect between the City's existing 8-inch diameter force main along Osteen Road, or 12-inch diameter force main directly to the west, and the County's existing 18-inch diameter gravity sewer piping along Little Road, a distance of approximately 2,800 linear feet. The sewage flows in the County's gravity sewer are directed toward the south into the County's master lift station (#03-92) near Plathe Road. The lift station discharges into a 16-inch diameter force main which connects to the nearby 24-inch diameter force main along Trouble Creek Road. This large diameter piping is one of the primary transmission conduits to transfer wastewater to the County's Shady Hills WWTF and is able to convey substantial volumes of water. A piping interconnect between the City's and County's system in this location would likely allow for the potential diversion of the majority of wastewater flows from the northern portion of the service area.

2. Trouble Creek Road Force Main – This option consists of the installation a piping interconnect between the County's existing 24-inch diameter force main along US Highway 19 to the County's existing 20-inch diameter force main piping at the southwest corner of Rowan Road and Trouble Creek Road, near master lift station #02-75 and covering a distance of approximately 13,800 linear feet. Currently, the majority of the wastewater flows from the southwest portion of the County are directed to the booster pump station along Moog Road, which then transfers the flows to the City's WWTF through a 24-inch force main. The proposed interconnect would allow this flow to be directed instead to the large diameter primary transmission system along Trouble Creek Road, with the wastewater directed to the County's Shady Hills WWTF. This interconnect would likely be able to offset almost 2 MGD from the City's WWTF to the Shady Hills WWTF in an emergency situation. This same piping interconnect would provide benefit to the County as well in the event that a piping rupture occurred within their transmission system, as it would allow wastewater flows from the County's system to be transferred to the City's WWTF.

3. State Road 54 Force Main – This option consists of the installation of a piping interconnect between the County's existing 12-inch diameter force main along SR 54, from Grand Boulevard to Madison Street, a distance of approximately 2,800 linear feet. Currently, a gap in the County's transmission system piping exists in this area. If this piping gap was closed, it would allow the County to shift some of the wastewater flows from the southwest portion of the County, which have historically been directed to the US Highway 19 corridor, and subsequently to the Moog Road booster station and the City's WWTF, instead to the County's transmission system along Trouble Creek Road and then to the Shady Hills WWTF. This shift in the flow direction would provide an offset of wastewater flows from the City's WWTF to the County's system.

It should be noted that the interconnects would not allow for a complete diversion of flows from the City's WWTF but they would provide a substantial reduction of incoming flows and alleviate sewer backup impacts at numerous lift stations in the event of an emergency. In addition, system hydraulic conditions would need to be evaluated in more detail within the local County system to determine what type of pump station upgrades might be required to accommodate the maximum transfer of flows under the various options.

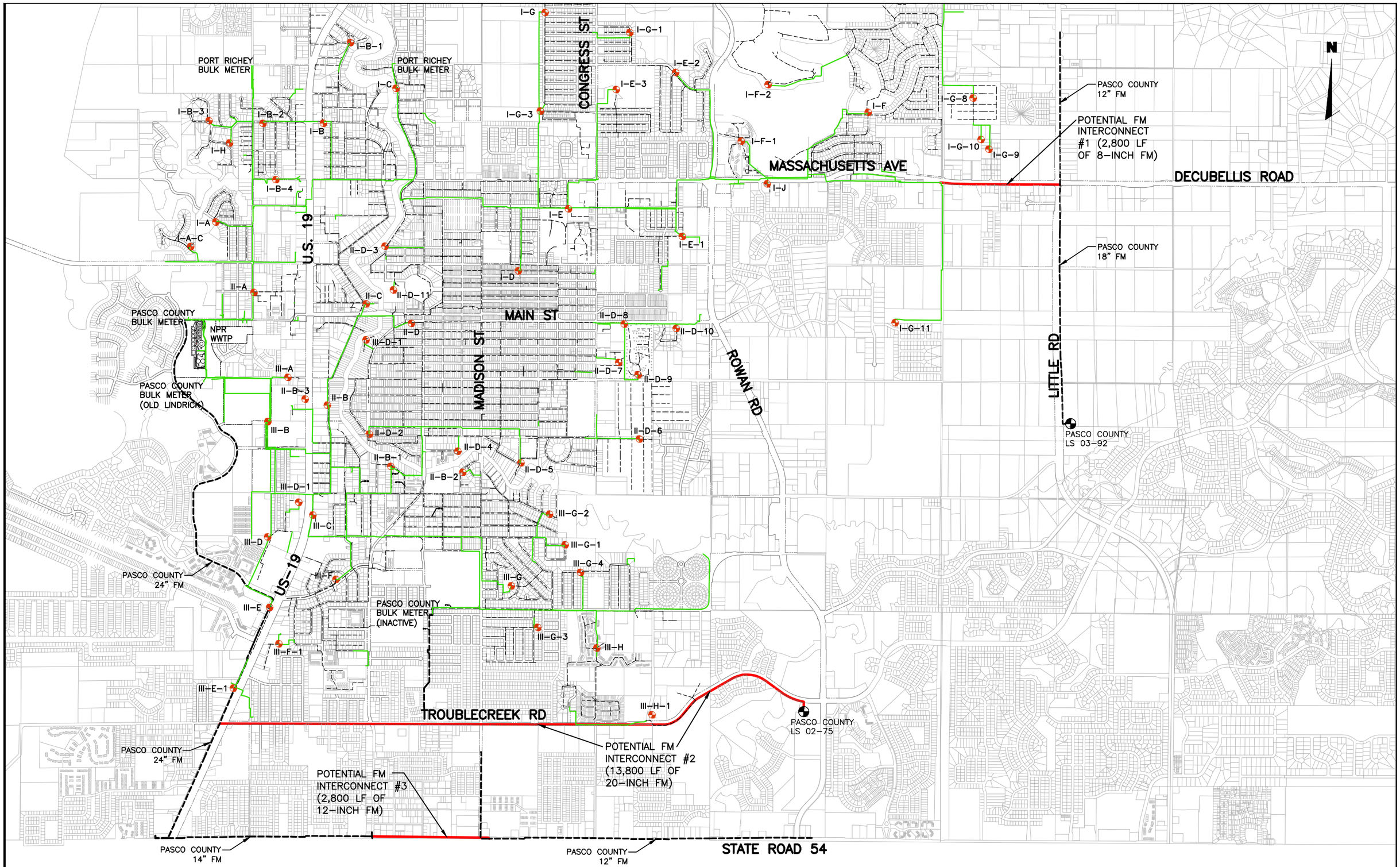


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		FIGURE NUMBER 4-10

4.4.5. SYSTEM CONDITION

Because of the harsh environment in which wastewater collections systems must operate, deterioration of pipe and equipment is frequently more rapid than with other public works utilities. Over the years the City has continuously maintained a program of renewal and replacement of wastewater collection system components, while at the same time upgrading to newer materials and technologies as funding permitted. For example, old force mains constructed with un-coated and/or un-lined cast or ductile iron pipe have been replaced with newer corrosion resistant (PVC, polyethylene) pipelines. Manholes and wet wells that have been eaten away by acid formed by hydrogen sulfide have been lined with acid resistant coatings or replaced. Lift stations constructed with carbon steel components, and having suffered from both internal and external corrosion, have been replaced with new corrosion resistant materials and equipment. Gravity sewer lines constructed of rigid vitrified clay pipe that has cracked have been lined and/or replaced with more flexible PVC pipe.

As a result of the above renewal and replacement program, portions of the City's collection system are in good condition while others are in line for upgrading.

4.4.6. OBSERVATIONS

Infiltration/Inflow

In addition to coastal areas, infiltration and inflow from other areas should also be minimized. All such unwanted water entering the wastewater collection system must be pumped and treated resulting in correspondingly larger pumps, pipelines, and treatment facilities along with higher operating costs. For instance, in 2023 the City and surrounding region experienced a drought year in which the yearly rainfall was measured at 30-inches versus the typical yearly rainfall of over 50-inches. The plant inflows averaged 4.7 MGD, approximately 1.0 to 1.5 MGD less than the average flows from the previous 10-years. There are other years that show abnormal flows, such as 2018 (60.7 inches; 6,436,000 gpd) and 2019 (70.9 inches; 6,302,000 gpd), compared to low rainfall years, such as 2022 (49.1 inches; 5,472,000 gpd) and 2023. This disparity in flow amounts shows the impact that rainfall events have on the infiltration and inflow into the City's collection system, as well as the contributing collection systems of Pasco County and the City of Port Richey. The City's

ongoing program of lining and waterproofing the existing collection system should be a priority in the overall maintenance process.

Chlorides

Because land application of water, in various forms, is the ultimate disposition of wastewater collected and treated by the City, it is critically important that coastal area infiltration and inflow be minimized. High dissolved solids (salts) found in coastal waters once introduced into the system are not removed, only diluted. Consequently, reuse water containing high dissolved solids has the potential to cause violations of groundwater standards at land application sites. Therefore, the City should emphasize reduction of infiltration and inflow from its coastal areas and insist upon the same from its customers.

Magnolia Valley Force Main Failures

City staff have reported repeated failures of the 10- and 12-inch diameter force main system running between Magnolia Valley and the City's Recreation Center. In addition, they have indicated that this force main system was constructed with relatively thin-walled PVC pipe. Fatigue failure of thin-walled PVC force mains has been a well-known problem in the engineering community for many years. The City has taken steps to reduce transient pressure surges in this system to help mitigate the problem. However, continued development and acquisition of private systems along the Massachusetts Avenue corridor east of Rowan Road only increase flows and pressures on this force main.

Reliability/Redundancy/Interconnections

The City's wastewater treatment facility has experienced a rupture in one of the influent process pipes which resulted in the release of untreated wastewater into Cross Bayou. As previously discussed, to provide higher levels of reliability in the treatment facility operations and minimize the impacts of potential force main or process piping failures, potential system interconnects with Pasco County were investigated as part of the modeling effort.

4.5. WASTEWATER TREATMENT SYSTEM

4.5.1. GENERAL

As was described in depth in the 2011 Master Plan Update, the City's wastewater treatment system has evolved in response to regional growth impacts, effluent disposal options, and permit requirements. Because of this historical development, the City's choices relating to facility location, treatment process, unit processes, disposal, etc. were not based upon today's regulatory environment and requirements. Consequently, it may be operationally more difficult for the City to comply with future regulatory requirements.

The New Port Richey WWTF had the Schreiber Process Unit built in 1983 as a 1.5 MGD pre-engineered package plant with extended aeration treatment. At that time, the Schreiber unit was the primary biological treatment for the WWTF and included internal clarification. In 1989 the facility was expanded to a 4.5 MGD plant with an oxidation ditch system operating with extended aeration treatment with denitrification. To handle additional development in the service area, the City expanded the plant in 1992 to its current configuration and capacity. The New Port Richey WWTF is permitted as a Type 1 combined extended aeration and biological nutrient removal (BNR) domestic wastewater treatment facility with a capacity of 7.5 MGD AADF.

The existing treatment process for the oxidation units is single stage nitrification/denitrification, a type of extended aeration biological nutrient removal process. The four (4) oxidation ditch process units are designed to remove nitrogen from the influent wastewater, and generally in a similar fashion to the Schreiber process. The oxidation ditch is designed as a continuous channel. The surface mounted aerators provide two primary functions: (1) the required dissolved oxygen for the process operation and (2) the flow velocity within the basin to maintain the mixed liquor in suspension.

The oxidation ditch process provides nitrification and denitrification within a single loop basin by providing aeration and anoxic zones in the same basin. The influent wastewater and return activated sludge are introduced to the oxidation ditch in the aeration zone, which provides the oxygen for BOD reduction. This process aids in the removal of nitrogen in the wastewater by converting influent ammonia (NH3) to nitrate (NO3) in the aeration zone. As the mixed liquor flows through the channel from the aeration zone, the dissolved oxygen is used and the basin transforms into an anoxic zone. It is in this zone the bound oxygen is used which converts the nitrate (NO3) to

nitrogen gas (N2). As the channel flow returns to an aeration zone, the nitrogen gas is volatized into the atmosphere.

The nitrification/denitrification process requires a longer mean cell residence time, also expressed as solids retention time, than conventional activated sludge treatment process. This results in larger basin volumes. Each oxidation ditch has 2 aerators of 150 HP each. The concentration of dissolved oxygen in the process can be adjusted by turning one of the aerators off and/or lowering the effluent weir to reduce the power draw of the aerators.

The New Port Richey WWTF currently includes: two (2) mechanically cleaned bar screens with a manual bar screen back-up; two (2) circular grit removal concentrating tanks with grit pumps, grit dewatering unit and classifier; one (1) Schreiber process aeration tank with an internal secondary clarifier; four (4) oxidation ditches with mechanical surface aerators operating in the extended aeration process mode; four (4) circular secondary clarifiers with suction arm type sludge removal; four (4) single-media traveling bridge sand filters; two (2) chlorine contact basins for high-level disinfection; two (2) 4.5 million gallon effluent reject storage tanks; effluent pumping and storage facilities which includes two (2) on-site 2.0 million gallon storage tanks to deliver suitable water to the City of New Port Richey Master Reuse System (R-001) and the Pasco County Master Reuse System (R-002), and a surface water discharge (D-001) for wet weather disposal. Residuals generated by the plant are held in a thickening tank before being dewatered by the two (2) belt filter press. The dewatered sludge is pumped to an open bed truck and transported, treated and disposed of by others at an approved site.

4.5.2. CAPACITY

The existing wastewater treatment plant is currently permitted to treat 7,500,000 gpd of wastewater. If one looks at the site plan, it is evident that expansion beyond 7,500,000 gpd, or adding treatment elements to meet higher advanced treatment standards, would be difficult to accomplish due to space limitations.

Historical flows over the past 10 years show an average yearly flow of 5,913,000 gallons per day, with flows to the City's wastewater treatment plant generally maintaining a consistent level. As discussed in Section 4.3.5, major flow changes the facility experiences can be attributed to rain events as seen with high rainfall years and the significant reduction in flows during the low rainfall years.

The service areas of New Port Richey, Pasco County, and Port Richey systems that flow to the WWTF are generally built out, with some potential increases from infill development and septic to sewer conversions. It appears that the plant has adequate reserve capacity for the foreseeable future.

4.5.3. CONDITION

Although functional portions of the City's wastewater treatment plant date back to the early 1960s it is evident from our site visits to the plant that the facility is well run, properly maintained, and generally in good condition.

Over the years, through a combination of staff-executed work, upgrades, expansions, and contracted repairs the City has continually maintained the condition of this facility to a high standard. However, the City has focused funding on the upgrade of the pumping and transmission systems over the past 15 years and the WWTF has lacked significant financial investment that is needed to recondition/rehabilitate the various major mechanical equipment and structures. This rehabilitation work should be a funding priority for the City to implement over the next 10 years.

4.5.4. OBSERVATIONS

Oxidation Ditch Treatment Process

As was mentioned previously, the extended aeration treatment process utilized at this plant is a process that was originally selected to protect Cross Bayou from high ammonia and low dissolved oxygen levels. Upon reducing this surface discharge and converting this plant to a reuse facility the extended aeration process becomes less than ideal due to its tendency to convert nitrogen to its nitrate form, which was previously limited to 12 mg/L for reuse water. The current permit revised the nitrogen limit to 8.9 mg/L (as Total Nitrogen). Most contemporary reuse facilities today employ some degree of denitrification to control nitrate concentrations. By controlling the number of aerators operating in each oxidation ditch, the treatment process can develop anoxic conditions within certain zones of the ditch and thereby convert the nitrates to nitrogen gas and reduce the nitrate concentration in the effluent.

In addition to the above and as discussed in Section 4.3, the current regulatory climate suggests an increasing emphasis will be placed on nutrients entering and impairing surface water bodies from various sources, including reuse water and its associated wet weather backup disposal systems. The Administrative Order that is currently included as part of the City's WWTF domestic wastewater permit is requiring wastewater treatment facilities discharging to the Pasco County Master Reuse System to reduce the effluent total nitrogen to 3.0 mg/L on an annual average basis. The City should continue to coordinate with Pasco County on any proposed treatment process options to meet the upcoming nitrogen limit that are discussed with FDEP.

Schreiber System Treatment Unit

As detailed in a recent report (*New Port Richey Wastewater Treatment Facility Schreiber Process Unit Evaluation,* Stroud Engineering Consultants, April 2024) the Schreiber unit has a treatment capacity of 1.5 MGD and was constructed in the early 1980's and is currently limited in operational capability due to deteriorated mechanical equipment.

Oxidation Ditch Aeration/Mixing

The City of New Port Richey's wastewater treatment plant is equipped with four relatively deep, folded over, plug flow, extended aeration, oxidation ditch activated sludge process units. The design of these units, and the aeration equipment furnished as part of the 1986 and 1990 plant expansions, was based on Eimco Water Technologies Carrousel technology.

Each of these four oxidation ditch units is equipped with two 150 horsepower, fixed, vertical shaft, mechanical surface aerators. One aerator is mounted at the influent end of each basin while the other is located halfway down the hydraulic length of each basin. The aerators were initially installed with single speed motors, however recent improvements included converting one aerator in each basin to variable speed drive.

Under normal operating conditions, one aerator in each basin operates continuously while the other is held in reserve. By design, dissolved oxygen levels in each basin vary along the length of each plug flow oxidation ditch. Operator control of dissolved oxygen levels is accomplished by adjusting the liquid level in each basin, and consequently each aerator's submergence. Ten-foot-long effluent weirs, located in each oxygen ditch unit, can be manually adjusted to raise or lower overall liquid levels.

The above configuration and process selection was originally selected to comply with the plant's surface discharge effluent requirements, coupled with the limited available land area at the plant (*New Port Richey WWTP 3.0 MGD Expansion Technical Memoranda,* CH2MHill, November 29, 1984).

Over the years, this plant has gradually evolved from a surface discharge facility to a reuse facility. As a result, effluent requirements have also changed. Of particular importance is the nitrate concentration of the effluent. The original surface discharge permit mandated nitrification (high oxygen input) in order to minimize high ammonia concentrations and to control dissolved oxygen levels in the receiving water. However, current reuse requirements limit effluent nitrate concentrations to 12 mg/l, encouraging less oxygen input.

A previous study commissioned by the City (*Preliminary Design Report for WWTP Aeration Evaluation*, C & D Engineering, Inc., September 2004) looked at alternative ways to better control the dissolved oxygen levels in the existing oxidation ditch units. This study recommended that the City pursue conversion of its existing fixed speed aerators to a variable speed dual aerator/impeller configuration, including their associated dissolved oxygen monitoring and control systems.

Over the past 10 years, the above recommendations have been partially implemented and they remain valid. By allowing the plant operators better control of the existing treatment process, one could reasonably expect better management of nitrification/denitrification, total nutrients in the effluent, as well as a decrease in energy consumption associated with better mixing and dissolved oxygen control.

RAS/WAS Pump Station

In conjunction with the oxidation ditch, activated sludge process units constructed as part of the 1986 and 1990 plant expansions, control of Return Activated Sludge (RAS) and Waste Activated Sludge (WAS) was based on relatively simple liquid level control, weir gates, sumps, and constant feed pumps. Subsequent improvements were made to add an additional pump and variable frequency drives to the existing pumps to allow greater pump control.

In conjunction with the above modifications to aeration and mixing, providing the plant operators with better control of RAS/WAS rates is also an integral part of managing nitrification/denitrification,

total nutrients, and energy consumption associated with better mixing and dissolved oxygen control. To accomplish this, modifications can be made to the existing RAS/WAS pumping system to include bypass piping directly to each oxidation ditch, with automated isolation valves and magnetic meters at each pump to better control the feed rates to each ditch.

Structural Integrity

Most of the wastewater treatment plant's water holding treatment structures are constructed of conventional reinforced concrete. As such, these structures contain various expansion, contraction, and construction joints employing flexible joint material that allows movement yet maintains a watertight joint. Over time, this joint material tends to breakdown, become more brittle, and leak. As such, consideration should be given to systematically removing each tank from service for examination and potential replacement of joint material.

Headworks

As with many treatment plants, the headworks structure at the City's wastewater plant has experienced the damaging effects of hydrogen sulfide, and its associated sulphuric acid formation, on its structure. It appears that the problem became acute after the 1990 plant expansion when the headworks structure was enclosed in conjunction with installing an odor control system at the headworks. Although the staff has undertaken repair work on the structure, a comprehensive approach to the hydrogen sulfide problem should be implemented.

Consideration should be given to the use of acid-resistant materials and coatings in critical areas of the structure as well improvements to air flow and ventilation associated with the odor control system. In addition, the distribution weir gates and the rubber bellows assembly between the headworks structures should be replaced due to the deterioration of the equipment.

Clarifiers

The City's wastewater plant is currently equipped with four final clarifiers and has room for the construction of two more in the future. The first two of these clarifiers were constructed as part of the 1986 plant expansion and the second two with the 1990 expansion. Given the age of these clarifiers, and their importance to the overall performance of a reuse plant, consideration should be

given to removing each from service for a thorough examination and renewal and replacement of mechanical equipment as required.

Process Piping

The plant's process piping has in recent years shown excessive corrosion and in one case ruptured, sending untreated waste into Cross Bayou. Pipe thickness testing has been conducted by the City to identify pipes with deterioration and potential replacement. The influent piping to each oxidation ditch has been replaced or lined, with isolation valves installed to assist with minimizing the potential for the liquid in the oxidation ditches from backflowing in the event of an influent pipe failure. Effluent piping to ditches 3 and 4 has been replaced with new piping and isolation valves. Consideration should be given to periodically measure the pipe thickness of any process piping that has not been replaced or lined.

Residuals Treatment and Odors

The plant's existing residuals treatment consists of a sludge thickening basin followed by pumping to a sludge holding basin with aeration. Thickened sludge from the sludge holding basin is pumped to the belt presses which provide additional dewatering of the sludge before being hauled to an offsite residuals processing facility. The combined volumes of the sludge thickening basin and sludge holding basin amount to approximately 4 days of sludge age. This sludge age does not provide enough time for sufficient volatile solids reduction, of which the volatile solids contain odor producing biological matter. As the pressed sludge is conveyed to the tractor trailer prior to hauling to an offsite processing facility, the remaining biological material can rapidly become septic and develop a highly offensive odor. Consideration should be given to evaluating potential treatment options for reducing the residuals odor condition.

Flooding Vulnerability

The recently completed Vulnerability Assessment (GHS Environmental, September 2024) identified the WWTF as a critical asset located within the FEMA Flood Zone AE, with a flood elevation of 10.0 ft. Based upon a review of available record drawings of previous plant expansions, it appears that the City's WWTP has been built to be above the potential FEMA flood elevation. However, there may be process equipment, electrical equipment, and control instrumentation that potentially would be affected by a flood event.

4.6. REUSE WATER SYSTEM

4.6.1. GENERAL

As happened with the City's wastewater treatment plant, the City's reuse system evolved in response to numerous overlapping factors and influences, the most important being an ever-changing regulatory environment. The most significant recent change came in 2000 when state law changed, effectively eliminating the City's ability to continue discharging water into Cross Bayou.

Because of this change, the city acquired additional property, constructed reject water storage facilities, added reuse water storage, and entered into an agreement with Pasco County for the disposal of excess reuse water not used by the City.

In 2017, the regulatory situation again changed, allowing limited effluent discharges into Cross Bayou provided that the discharges occur during wet weather events.

4.6.2. CAPACITY

Data and results of computer modeling

As done with the water distribution and wastewater collection systems, mathematical computer models of the City's reuse distribution system were developed. Bently Systems OpenFlow WaterCAD was also used to perform the calculations and generate the desired reports for evaluation and analysis.

Using the above models, steady state analyses of existing and future systems were performed. In these analyses the operating behavior of the various system components, under various conditions were simulated in order to determine instantaneous system pressures, flow rates, head losses, velocities, etc. **Appendix H** contains the detailed results of the modeling effort.

Currently, the Wastewater Treatment Facility's Permit allows for a combined total of 11,700,000 gpd of reuse water to be disbursed, 7,500,000 gpd to Pasco County and 4,200,000 to the City of New Port Richey. Given the City's current reuse demand of approximately 1,700,000 gpd, the City could expand its reuse system up to approximately 1,500,000 gpd. Additionally, Pasco County has experienced substantial residential and commercial growth over the past 10 years, with many of

those developments incorporating reclaimed water irrigation systems. They have had difficulty in achieving the reuse water demands and appear to be able to accommodate additional reuse flows from the City.

4.6.3. CONDITION

Compared with the age of most of New Port Richey's utility system, generally all of the City's reuse system has been constructed after 1996. Consequently, the reuse system appears to be in good overall condition.

4.6.4. OBSERVATIONS

Wet Weather Backup

All reuse systems that supply irrigation system demands face the common operational necessity of balancing supply and demand. A reuse distribution system that is expanded to the point where there are enough customers to use all of the water produced will have an overabundance of water when customers aren't irrigating. Depending on the design of the system, this imbalance may happen on a daily basis as irrigation demand periods don't necessarily occur at the same time water is produced.

In 2000, when more stringent regulatory requirements mandated changes to the City's method of wet weather backup, the City investigated alternative strategies for future operation of its wastewater reuse facility (*Wastewater Treatment Plant Effluent Disposal Alternatives Analysis*, C & D Engineering, Inc., August 2000). This study recommended the City secure 130-300 acres of high-quality upland property and begin the phased construction of rapid rate infiltration basins and reuse transmission mains for wet weather backup. The study reviewed the City's current reuse system, previous studies, geologic mapping data, aerial photographs, and related data to suggest several parcels of land that could be considered for such a system. However, due to the rapid growth in the west Pasco region those sites are no longer available as residential and commercial mixed-use developments have acquired those sites and there appear to be no other suitable sites near the City's service area meeting the disposal parameters.

It was also recommended that the City consider a cooperative arrangement with Pasco County to share its reuse pipe network and make easier the delivery of water to well-drained areas suitable

for construction of rapid-rate land application systems. Subsequently, the City and Pasco County entered into an agreement whereby the County would take all surplus water produced by the City. As a result of this agreement, the City is operationally dependent on the County for disposal of surplus water within the County's system. On occasion, the City has had difficulty pumping adequate volumes of water into the County's reuse system due to an increase in back pressure from that system. As a result, during those times when the City cannot pump the reuse into the County's system the excess water is released into Cross Bayou via the outfall discharge.

High Service Pumping

Subsequent to the City and Pasco County entering into an agreement for the County to take all of the City's surplus reuse water, the City has experienced ever increasing backpressure from the County's reuse system. This increased backpressure necessitates the City operate its high service pumps at a higher, and less efficient, discharge pressure than was originally designed.

Computer modeling shows that this increased backpressure results from high design pressures associated with some of Pasco County's major reuse pumping facilities, particularly the Shady Hills Subregional Reuse Facility and the Land O' Lakes Subregional Reuse Facility.

Expansion

Historical flow data indicate that on an average daily basis the City reuses approximately one third of the raw wastewater it treats, excluding Pasco County's raw wastewater component. The remaining two thirds (approximately 3.4 million gallons per day) is transferred into the County's reuse system for reuse and/or disposal. Consequently, opportunities exist to expand the City's reuse system in ways that would reduce potable water consumption and/or pumping from groundwater resources.

Storage

The City's current reuse storage capacity (4.0 million gallons) should be considered a minimum for a treatment facility of this size. This is especially true given that the City's treatment facility is dependent on remote sites for disposal of the bulk of the water it produces. Fortunately, the City was far sighted enough to purchase sufficient property adjacent to the treatment plant suitable for this additional storage. Preliminary design of an additional 15 million gallons of reuse storage has

already been completed. Strong consideration should be given to adding additional storage along with expansion of the City's reuse system to assure a continuous supply of reuse water without interruption and to provide a buffer for wet weather conditions.

4.6.5. POTENTIAL PROBLEMS

As was described in detail previously, prior to November 2005 the City of New Port Richey could dispose of surplus reuse water into Cross Bayou. At that time, regulatory changes forced the City to eliminate this discharge and find an alternative way to dispose of water not used by its reuse customers. To solve this problem, the City acquired property south of the wastewater treatment plant, constructed additional reuse storage, added reject water storage, and entered into an agreement with Pasco County whereby the County took all surplus water produced by the City, at no cost. However, In May 2011, the City was notified by Pasco County that it intended to begin charging the City for reclaimed water flowing into its Master Reuse System in accordance with a December 16, 1984 agreement between the City and Pasco County. The initial cost of providing this service was estimated to be $0.44 per 1,000 gallons of water or roughly $490,000 per year at current flows. In addition, the City continues to have difficulty physically pumping reuse water into the County's reuse system. Based on the above, it may be necessary for the City to revisit it's prior decisions relating to the disposition of its reuse water.

In prior years, the City examined various alternatives for disposal of its effluent (*Wastewater Treatment Plant Effluent Disposal Alternatives Analysis,* C & D Engineering, Inc., August 2000). At that time the City considered a Cross Bayou Outfall, Gulf Outfall, Injection Wells, Rapid Rate Infiltration Basins, Spray Irrigation, and Wetlands Application of treated effluent. The result of this study was a recommendation that treated wastewater generated by the City of New Port Richey's Wastewater Treatment Facility consist of an expanded Master Reuse System coupled with rapid-rate infiltration basins as the primary means of backup disposal.

In order to implement the recommendations contained in the above study, the City completed two needed and necessary aspects of its Master Reuse System. First, the City acquired additional land south of the wastewater treatment plant and constructed reject water storage and recycle facilities on this property as required by regulation. In lieu of constructing its own rapid-rate infiltration basins, the City entered into an interlocal agreement with Pasco County whereby the County would provide backup disposal for the City's Master Reuse System through the County's Master Reuse System containing, among other things, rapid-rate infiltration basins.

4.7. RECOMMENDATIONS

4.7.1. WASTEWATER COLLECTION SYSTEM

Massachusetts Avenue Force Main Failures

City staff have reported repeated failures of the 10 and 12-inch diameter force main system running along Massachusetts Avenue between Magnolia Valley and the City's Recreation Center. In addition, they have indicated that this force main system was constructed with relatively thin-walled PVC pipe. Fatigue failure of thin-walled PVC force mains has been a well-known problem in the engineering community for many years. Although the City has taken steps to reduce transient pressure surges in this system, it is recommended that the City conduct a thorough examination of the original contract documents and shop drawings for this force main project to verify the materials used for its construction. In addition, subsurface investigation of the materials in select locations may be beneficial to verify the extent of piping that needs to be considered for replacement.

Steel Dry Pit Lift Stations

Over the years, the City has systematically replaced many of its older (1960s) steel dry pit lift stations as they reached their useful life due to external and internal corrosion. However, a few of these lift stations remain in service. It is recommended that the City upgrade the remaining steel dry pit lift stations in the following priority order as funding permits:

- III-G (Tanglewood at Maplewood Drive)
- II-B (S. River Rd./Shaw St.)
- II-D-01 (Lafayette St. & Montana Ave.)

Cast Iron Force Mains

Due to the potential for failure, and the reduction in hydraulic capacity associated with older un-coated and/or un-lined cast iron force mains, these older cast iron force mains should be replaced with newer corrosion resistant (PVC, polyethylene) pipelines as funding permits. If possible, replacement of these force mains should be coordinated with lift station upgrades and a strategy of re-routing to optimize the utilization of newer force mains. For example, the City has recently extended its south side system of 20-inch, 18-inch, and 14-inch diameter force mains to the vicinity

of Gulf Dr. and Magnolia Way. Replacement of the old 12-inch and 8-inch cast iron force mains utilized by Lift Stations II-B (S. River Rd./Shaw St.), II-C (Bridge Rd./N. River Rd.), and II-D (Bank St./Nebraska Ave.) could also be eliminated by constructing new force mains along Main Street, River Road, and South Road to connect to the force main transmission system near the WWTF.

Lift Station III-G Hydraulics

Lift Station III-G (Tanglewood at Maplewood Drive) functions as a master lift station, repumping flows from five or more smaller lift stations in the area. However, this relatively high-capacity lift station pumps considerable distance through an undersized 6-inch force main before it increases to 8-inches. It is recommended that this bottleneck be minimized or eliminated.

Additionally, after the LS III-G force main is upsized the combined 8-inch force main along High Street from Madison Street to Charles Street should be upsized and rerouted to connect to the larger transmission force main near Gulf Drive.

Force Main Interconnections

The ability for the City to divert a portion of the incoming flows from its wastewater treatment facility due to operational issues at the plant or disruptions in the force main system could provide higher levels of reliability in the treatment facility operations and minimize the impacts of potential force main or process piping failures. As discussed previously, several potential system interconnects with Pasco County were identified. It is recommended that the City consider further evaluation of the following potential force main interconnections with the Pasco County system:

- Massachusetts Avenue Force Main
- Trouble Creek Road Force Main
- State Road 54 Force Main

4.7.2. WASTEWATER TREATMENT SYSTEM

Schreiber Treatment Unit

Given the magnitude of current plant flows, and the nature of subsequent recommendations, it is recommended that the City consider placing the Schreiber plant back into service prior to

implementing these recommendations. This will allow the current flows and loadings to be stabilized while other process units are taken out of service for rehabilitation.

Without the Schreiber process on-line, the plant is rated for a capacity of 6.0 MGD. Since the existing oxidation ditch units are operating as a single basin 2-stage nitrification/denitrification process, it is recommended that the City retrofit the Schreiber tank as a separate basin 2-stage denitrification process to better match the other treatment basins as outlined in the recent evaluation (*New Port Richey Wastewater Treatment Facility Schreiber Process Unit Evaluation*, Stroud Engineering Consultants, January 2024).

Headworks

The existing Headworks structure has over 40 years of active service and needs significant rehabilitation. While a new headworks structure would help alleviate some of the operational difficulties, the capital cost would be high and site space available for such a structure would be problematic. Instead of a new headworks structure, it is recommended that the City rehabilitate the existing headworks structure.

The existing odor control system should be upgraded to provide better air flow under the enclosed areas. As portions of the headworks are taken out of service, surfaces vulnerable to acid attack should be replaced with acid resistant materials and/or coatings.

Clarifiers

Since the existing primary clarifiers were constructed over thirty years ago, it is recommended that the City remove each clarifier from service and refurbish and replace the mechanical equipment and structural steel components of each as required.

Aeration/Mixing

It is recommended that the City continue to implement the recommendations found in the previous master plan study *(Utility System Master Plan Update – 2011,* C & D Engineering, Inc., October 2012) relating to conversion of its existing fixed speed aerators to a variable speed dual aerator/impeller configuration. Implementation of these recommendations will allow the plant operators better control of the existing treatment process, manage nitrification/denitrification and

effluent nutrient concentrations, as well as a decrease in energy consumption associated with better mixing and dissolved oxygen control. While the City converted four (4) of the eight aerator motors to variable frequency drives, conversion of the other four aerator motors to VFD control is recommended. The installation of dual aerator/impeller configuration aerators is also recommended.

RAS/WAS Pump Station

In conjunction with the above modifications to aeration and mixing, the previous master plan study *(Utility System Master Plan Update – 2011,* C & D Engineering, Inc., October 2012) recommended improvements relating to existing RAS/WAS pumping system to include variable frequency drives with programable logic control. Careful control of RAS/WAS rates is also an integral part of managing nitrification/denitrification, total nutrients, and energy consumption. Those improvements were subsequently made by the City. Therefore, further recommended modifications to the RAS/WAS pumping system include bypass piping directly to each oxidation ditch, with automated isolation valves and magnetic meters at each pump to better control the feed rates to each ditch.

Dewatering System

The dewatering belt presses have been in service for over 20 years of continuous operation. The presses need replacement of belts, roller assemblies, hydraulic systems, drive units, electrical and control system, etc.

Structural Integrity

It is recommended that City systematically remove each reinforced concrete water holding tank structure from service to allow for cleaning and examination and replacement of construction/expansion joint material. Logically, this effort should take place while other recommendations (aerators, effluent weir gates, etc.) are being implemented.

Residuals Treatment and Odors

It is recommended that the City conduct an evaluation of potential treatment options for reducing the residuals odor condition. The WWTF used to have an aerobic digester as part of the residuals

treatment process. To make room for reuse storage tanks, the digester was removed from service and demolished.

Flooding Vulnerability

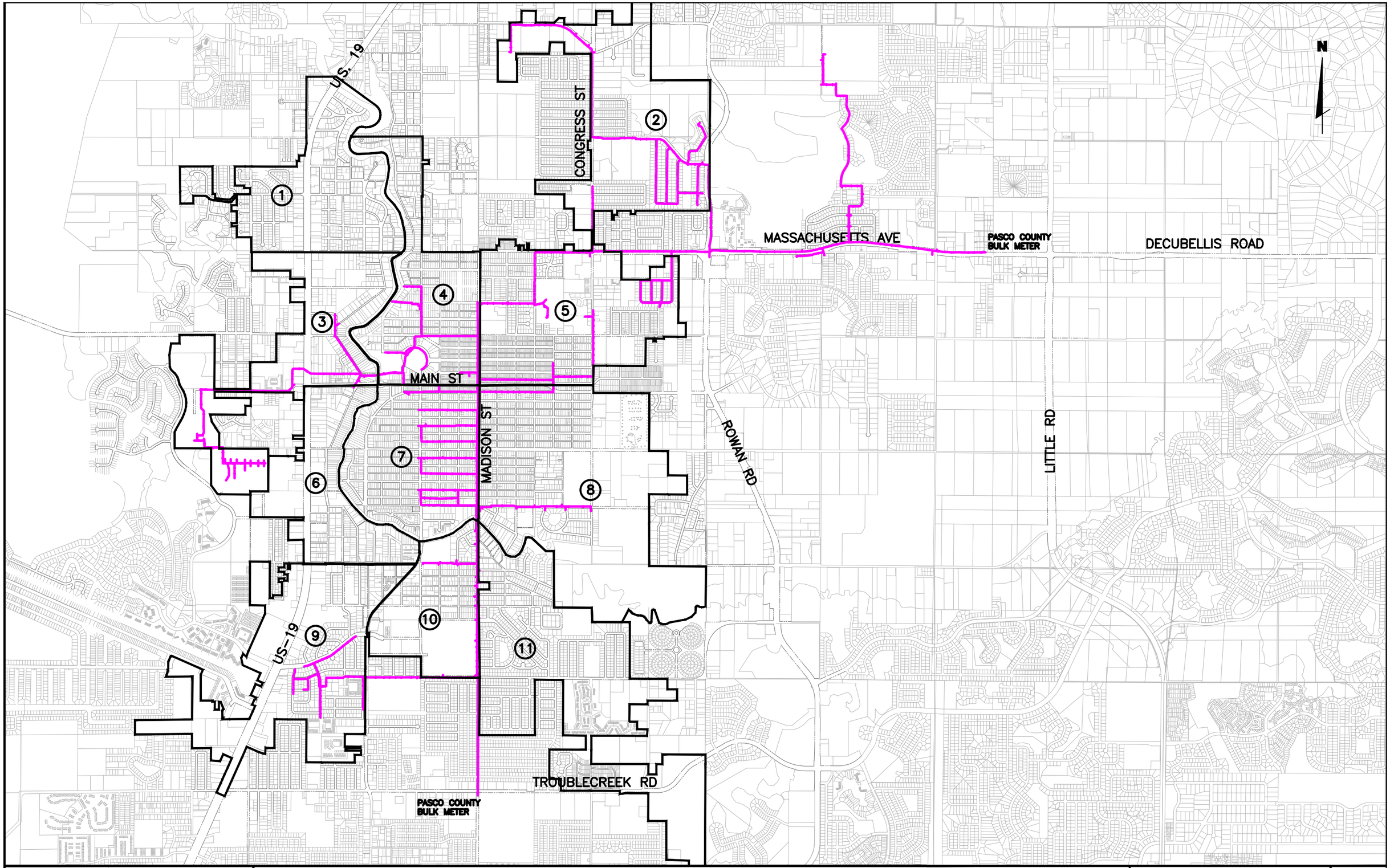
As the treatment plant is located within the flood zone, it is recommended that a detailed review of the facility be conducted with a focus on identifying process equipment, including pumps, electrical panels, control instrumentation, etc. that may be at risk due to flood events.

4.7.3. REUSE WATER SYSTEM

Expanded City Reuse System

By 2001 the City of New Port Richey had constructed the major backbone of its Master Reuse System. In 2001, the City commissioned a master plan update to address the potential for further expansion of its reuse system into additional areas (*Reclaimed Water Master Plan Update*, McKim & Creed, March 2002). The primary outcome of this plan was the identification and prioritization of future areas of expansion to the City's reuse system, based on the most favorable benefit/cost ratio. **Figure 4-11** depicts the reuse service areas identified in this master plan and **Table 4-2** summarizes the details of these same areas in the order in which they were prioritized. As of today, portions of areas 2, 3, 4, 5, 7, and 9 have had their reuse systems expanded.

In order to reduce the volume of reuse water flowing into Pasco County's Master Reuse System and its associated cost the City of New Port Richey it is recommended that the City continue to expand its reuse system as funding permits. In addition to the reuse service areas shown on **Figure 4-11,** the City would also benefit from expansion of its reuse system to include large parcels of land near its existing reuse piping. Since the prior master plan update, the City has expanded the reuse system to include the Meadowlawn Memorial Gardens Cemetery and the WWTF reject site. Another potential large site option is the Carlton Arms Apartment complex adjacent to the old Magnolia Gardens golf course site.



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PLANNED REUSE SERVICE AREAS

FIGURE NUMBER
4-11

Table 4-2 – Reuse Service Areas

Service Area No.	Irrigable Acreage (acre)	Connection Fraction	Net Irrigable Acreage (acre)	Irrigation Rate (in/wk)	Residential Commercial Demand (gpd)	Service Area Subtotal (gpd)
05						
Residential & Commercial	124.0	0.80	99.2	1.00	384,797	
Schools, Parks, Large Turf Areas	16.0	1.00	16.0	1.50	93,088	477,885
03						
Residential & Commercial	70.0	0.75	52.5	1.00	203,648	
NPR WWTP	61.1	1.00	61.1	1.40	332,000	535,648
07						
Residential & Commercial	129.0	0.80	103.2	1.00	400,313	
Schools, Parks, Large Turf Areas	0.0	1.00	0.0	1.50	0	400,313
02						
Residential & Commercial	89.0	0.75	66.8	1.00	258,923	
Schools, Parks, Large Turf Areas	26.0	1.00	26.0	1.50	151,268	410,191
01						
Residential & Commercial	117.0	0.75	87.8	1.00	340,382	
Schools, Parks, Large Turf Areas	0.0	1.00	0.0	1.50	0	340,382
04						
Residential & Commercial	107.0	0.80	85.6	1.00	332,042	
Schools, Parks, Large Turf Areas	20.0	1.00	20.0	1.50	116,360	448,402
11						
Residential & Commercial	103.0	0.75	77.3	1.00	299,653	
Schools, Parks, Large Turf Areas	2.8	1.00	2.8	1.50	16,290	315,943
08						
Residential & Commercial	149.0	0.80	119.2	1.00	462,377	
Schools, Parks, Large Turf Areas	26.0	1.00	26.0	1.50	151,268	613,645
10						
Residential & Commercial	44.0	0.80	35.2	1.00	136,541	
Schools, Parks, Large Turf Areas	44.0	1.00	44.0	1.50	255,992	392,533
06						
Residential & Commercial	54.0	0.75	40.5	1.00	157,100	
Schools, Parks, Large Turf Areas	0.0	1.00	0.0	1.50	0	157,100
09						
Residential & Commercial	136.0	0.70	95.2	1.00	369,281	
Schools, Parks, Large Turf Areas	0.0	1.00	0.0	1.50	0	369,281
Other Large Demands						
Calusa Elementary School	8.4	1.00	8.4	1.50	49,000	
Ridgewood High School	22.5	1.00	22.5	1.50	131,000	
Marchman Technical School	22.5	1.00	22.5	1.50	131,000	
Magnolia Valley Golf Course	65.0	1.00	65.0	1.50	378,000	
Marlow Elementary School	16.8	1.00	16.8	1.50	98,000	
Pasco Interlocal Agreement					3,000,000	3,787,000
Totals	1,453.2		1,193.6			**8,248,323**

Backup Disposal

It is important for the operators of any wastewater treatment facility to have control over all aspects of their facility that relate to permit compliance. Currently, the operators of the City's facility do not have full control over reuse storage volumes, flows, and pressures as these are dictated by the operation of Pasco County's reuse system. At times, the City has had to discharge treated effluent to the surface water outfall.

It is recommended the City continue to work with Pasco County to investigate options to improve the City's ability to convey its reuse water into the PCMRS, particularly during wet weather conditions.

Reuse Water Storage

In the early 2000's the City acquired approximately 14 acres of land, south of the wastewater treatment plant, suitable for use as a reject and reuse water storage site. 9.0 million gallons of reject water storage was constructed at the time while provisions were made for adding an additional 15 million gallons of reuse storage at a future date. It is recommended that City move forward with the construction of additional storage (7.5 million gallons per storage tank) on this site, along with expansion of the City's reuse system, to help assure a continuous supply of reuse water without interruption, and to maximize the volume of available water that is reused. Also, additional reuse storage would help to minimize the potential discharge of treated effluent to the City's surface water.