

Preliminary Cost Estimates and General Sequencing of Master Plan

***Task 4 of
Contract No. 2020-02***

Prepared for:

City of North Port Utilities
6644 W Price Blvd.
North Port, FL 34291

Prepared by:

Giffels-Webster Engineers, Inc.
900 Pine Street, Suite 225
Englewood, Florida 34223

October 15, 2020

GWE Project # 6450.00

PRELIMINARY COST ESTIMATES AND GENERAL SEQUENCING OF MASTER PLAN

INTRODUCTION

Using the Conceptual Map and the various identified Sewer Areas for Expansion produced in Task 3, “Task 4” consists of developing a general cost estimate as well as suggested construction sequencing of the wastewater expansion areas for consideration.

Several scenarios were developed based upon three fundamental parameters, namely density, status of City Roadway Paving Program, and cost.

Conditional relationships for areas occur due to geographic location of existing force main lines and/or existing lift stations. For example, the primary west to east flow of existing wastewater force main transmission lines on their way to the City’s wastewater treatment plant generally runs along Price Boulevard. Logical sequencing for proposed expansion areas would be to “build out” geographically along Price Boulevard.

Each area planned for construction includes the collection, vacuum / pump station, and force mains within the collection area. All new force mains within each area to be constructed includes: (1) the “pump-out” wastewater transmission line for the area itself, and (2) additional wastewater transmission lines to serve as future point-of-connection for the adjacent area.

The Task 4 scope does not include considerations for Wastewater Plant expansions or upgrades, nor include upgrades for existing wastewater force main transmission lines.

MASTER LIST

The Master List for Sewer Areas from the City of North Port Overall Wastewater Plan is provided herein as (Table 4.00)

The Master List includes (29) identified areas from the City of North Port Overall Wastewater Plan. The Master List order is generally by geographic location of each area, from east to west. Where conditional relationships exist, the conditional wastewater areas are listed in order of a logical construction sequence.

Tabular data for each wastewater collection area lists the following:

- Name of collection area with number of connections and proposed system type
- Number of occupied lots and approximate developed density as a percentage of total lots.
- Extent of existing city water main through the collection area
- Proposed vacuum station property identification number and zoning
- Year of road pavement overlay / maintenance
- Conditional relationships
- Budget estimates for water expansion, collection system costs

City of North Port Master Wastewater Plan

MASTER LIST

Name of Area	Number of Connections Lots / ERC's	Proposed System Type	Number of Occupied Lots	Approximate Density % Developed	Existing City Water Main Through the Area	Proposed Vac Station PID Number	Proposed Vac Station Lot Zoning	Year of Road Pavement Overlay / Maint	Conditional on FM already built for Vac Station	Water Cost (\$M)	Sewer Area Cost (\$M)	TOTAL Cost (\$M)
LANCELOT/GLENALLEN/FLORIBANNA *	1,864	Vacuum	664	36%	20%	0973-17-0428	RSF2	PAVED 2018	01.0 - N/A	11.2	28.0	39.1
MERONI PARADISE *	1,514	Vacuum	623	41%	10%	0950-13-5215	RSF2	PAVED 2016	01.1a - Lancelot	10.2	22.7	32.9
SKYVIEW/PONCE DE LEON *	1,796	Vacuum	517	29%	10%	0969-06-5413	RSF2	10% 2016	01.1b - Lancelot	12.1	26.9	39.1
CONSTITUTION *	1,432	Vacuum	191	13%	NO (Only Ponce De Leon Blvd, Hornbuckle Blvd, Ascot Dr)	0969-06-2977	RSF2	30% 2016	01.2 - Skyview and Lancelot	10.7	21.5	32.2
LADYSLIPPER	1,088	Vacuum	334	31%	NO (Only Sylvania Ave)	0968-05-7710	RSF2	PAVED 2016	02.0 - N/A	8.2	16.3	24.5
LADYSLIPPER NORTH	544	PAC-VAC	51	9%	0%	0954-14-1754	RSF2	PAVED 2016	02.1 - Ladyslipper	4.1	8.2	12.2
LORRI CIRCLE	27	Gravity	15	56%	0%	Right of Way	RSF2 (ROW)	PAVED 2016	02.2 - Ladyslipper and Ladyslipper North	0.2	0.4	0.6
SUNBURST	1,283	Vacuum	625	49%	10%	0956-14-3728	RSF2	PAVED 2016	03.0 - N/A	8.7	19.2	27.9
MADAGASCAR	2,058	Vacuum	834	41%	20%	0956-14-4263	RSF2	50% 2017	04.0 - N/A	12.3	30.9	43.2
CRANBERRY FIELDS EAST	1,444	Vacuum	593	41%	NO (Only Cranberry Blvd)	0961-11-2450	RSF2	PAVED 2021	05.0 - N/A	10.8	21.7	32.5
CRANBERRY FIELDS NORTH	1,235	Vacuum	361	29%	NO (Only Cranberry Blvd)	0960-11-2236	RSF2	PAVED 2020	05.1 - Cranberry E	9.3	18.5	27.8
CRANBERRY FIELDS SOUTH	1,375	Vacuum	609	44%	NO (Only Cranberry Blvd)	0964-08-4912	RSF2	PAVED 2020	06.0 - N/A	10.3	20.6	30.9
BLUE RIDGE-SALFORD NORTH	1,583	Vacuum	993	63%	60%	0980-03-9221	RSF2	PAVED 2016	07.0 - N/A	4.7	23.7	28.5
BLUE RIDGE-SALFORD SOUTH	1,467	Vacuum	1022	70%	80%	1003-00-8009	RSF2	30% 2016	07.1 - Blue Rdg-Salford N	2.2	22.0	24.2
SUMTER GARDENS	537	PAC-VAC	243	45%	10%	0991-19-0946	RSF2	PAVED 2016	08.0 - N/A	3.6	8.1	11.7
NORTH PORT GARDENS NORTH	1,882	Vacuum	891	47%	20%	0980-04-1544	RSF2	60% 2019 - 2021 100%	09.0 - N/A	11.3	28.2	39.5
NORTH PORT GARDENS SOUTH	1,900	Vacuum	891	47%	30%	0990-03-2036	RSF2	PAVED 2019	09.1 - NP Gardens N	10.0	28.5	38.5
CHAMBERLIN NORTH	1,667	Vacuum	780	47%	20%	0982-04-7228	RSF2	60% 2019 - 2021 100%	10.0 - N/A	10.0	25.0	35.0
CHAMBERLIN MID	1,603	Vacuum	718	45%	5%	0988-01-3223	RSF2	PAVED 2018	10.1 - Chamberlin N	11.4	24.0	35.5
CHAMBERLIN SOUTH	1,789	Vacuum	772	43%	10%	1006-00-8924	RSF2	PAVED 2018	10.2 - Chamberlin Mid	12.1	26.8	38.9
KENVIL	1,573	Vacuum	723	46%	0%	1008-25-4204	RSF2	PAVED 2016	11.0 - N/A	11.8	23.6	35.4
TOLEDO BLADE	1,626	Vacuum	389	24%	0%	1118-16-8641	GU (SCHOOL)	0%	12.0 - N/A	12.2	24.4	36.6
HABERLAND SOUTH	1,404	Vacuum	420	30%	NO (Only on S. Haberland Blvd, Jeannin Dr)	1140-17-7431	RSF2	80% 2017	12.1 - Toledo Blade	10.5	21.1	31.6
GARDENSIDE	1,779	Vacuum	522	29%	NO (Only E Price Blvd)	1117-24-0402	RSF2	60% 2017	13.0 - N/A	13.3	26.7	40.0
HABERLAND NORTH	1,670	Vacuum	391	23%	NO (Only on S. Haberland Blvd, E Price Blvd)	1122-16-0328	RSF2	50% 2017	14.0 - N/A	12.5	25.1	37.6
SAN MATEO NORTH	1,848	Vacuum	549	30%	NO (Only on San Mateo Dr, E. Price Blvd)	1122-08-8230	GU (PARK)	PAVED 2017	15.0 - N/A	13.9	27.7	41.6
SAN MATEO SOUTH	1,918	Vacuum	574	30%	NO (Only on San Mateo Dr)	1143-07-4424	RSF2	25% 2017	15.1 - San Mateo N	14.4	28.8	43.2
ATWATER NORTH	1,884	Vacuum	308	16%	NO (Only on Atwater Dr.)	1135-10-0205	RSF2	PAVED 2017	16.0 - N/A	14.1	28.3	42.4
ATWATER SOUTH	2,022	Vacuum	337	17%	NO (Only on Atwater Dr.)	1145-10-8011	RSF2	PAVED 2017	16.1 - Atwater N	15.2	30.3	45.5
Total	43,812		15,940	36%						291	657	949

* FL Scrubjay Permit Area affects 20% to 50% of these Lots

- Notes: (1) Water Cost is computed at \$7,500 per Lot / ERC (for Lots where existing City Water not available)
 (2) Sewer Area Cost computed at \$15,000 per Lot / ERC (includes Sewer Collection, Vacuum / Pump Station, and Sewer FM)
 (3) TOTAL Cost = Water Cost + Sewer Area Cost

Legend

- Good / Attractor Parameter
- Detractor Parameter
- Area is Conditional - needs FM constructed in another area
- Area is small and proposed to be served by either Gravity or PAC-VAC Sewer System

HISTORIC COSTS

Comparative construction costs were developed for some areas in Task 1 for the purpose of determining which type of collection was the most cost effective for a given area. However, without a specific design layout for each area to at least the 30% level, obtaining accurate quantities and pricing for specific areas cannot be achieved.

What can be done is to look at other completed projects in Florida that have similar characteristics as North Port in order to provide a *budget level estimate* of total project cost per connection. We provide a collection system cost comparison (Table 4.01) from other areas outside North Port to compare overall past collection system costs (design and construction) for similar septic to sewer projects built within the last five years.

Those historic cost comparisons are then used to estimate appropriate costs (2020 Dollars) for new water and wastewater utility project construction costs per ERC (Equivalent Residential Connection), summarized as follows:

Total Vacuum Sewer	\$ 15,000 per ERC
Total Water System	\$ 7,500 per ERC

The above figures include project “soft costs” such as survey, design, easements, station site cost, and legal costs; as well as the construction costs.

What is *not included* are any plant capacity fees, transmission fees, connection fees or any other base utility fees. Costs for the “on lot” connection from the structure to the right of way line, as well as septic tank abandonment are also *not* included.

The cost per ERC is for the current year (2020), so cost escalators may be appropriate as time goes on.

City of North Port Master Wastewater Plan

HISTORIC SEPTIC TO SEWER PROJECT COST COMPARISON

COUNTY	PROJECT NAME	YEAR BID	ERC'S	VACUUM PUMPING STATION	COLLECTION SYSTEM	TOTAL SYSTEM CONSTRUCTION	TOTAL SYSTEM CONSTRUCTION	Soft costs* per ERC	TOTAL VACUUM SEWER	POTABLE WATER SYSTEM CONSTRUCTION	WATER ERCs	WATER SYSTEM	Soft costs* per ERC	TOTAL WATER SYSTEM
							Cost/ERC	x 30%	Cost/ERC			Cost/ERC	x 25%	Cost/ERC
MARTIN	GOLDEN GATE	2020	775	\$ 1,655,000	\$ 10,343,244	\$ 11,998,244	\$ 15,482	\$ 4,644	\$ 20,126					
MARTIN	NORTH RIVER SHORES II	2018	300	\$ 1,498,025	\$ 4,047,686	\$ 5,545,711	\$ 18,486	\$ 5,546	\$ 24,031					
CHARLOTTE	ACKERMAN COUNTRYMAN	EOPC	1,696	\$ 1,500,000	\$ 19,702,366	\$ 21,202,366	\$ 12,501	\$ 3,750	\$ 16,252	\$ 9,543,352	1,696	\$ 5,627	\$ 1,407	\$ 7,034
CHARLOTTE	SPRING LAKE CONTRACT D	2017	504	\$ 1,545,715	\$ 3,285,934	\$ 4,831,649	\$ 9,587	\$ 2,876	\$ 12,463	\$ 1,841,385	504	\$ 3,654	\$ 913	\$ 4,567
CHARLOTTE	SPRING LAKE CONTRACTS A,B,C	2016	2,195	\$ 1,467,000	\$ 19,384,984	\$ 20,851,984	\$ 9,500	\$ 2,850	\$ 12,350					
CHARLOTTE	EL JOBEAN	2020	612	\$ 1,467,001	\$ 5,749,148	\$ 7,216,149	\$ 11,791	\$ 3,537	\$ 15,328					
SARASOTA	PCSSRP: AREA O&P	2015	1,300	\$ 947,810	\$ 11,743,132	\$ 12,690,942	\$ 9,762	\$ 2,929	\$ 12,691	\$ 4,586,121	723	\$ 6,343	\$ 1,586	\$ 7,929
ALL PROJECTS Average									\$ 16,177					\$ 6,510
							Cost/ERC	x 30%	Cost/ERC			Cost/ERC	x 25%	Cost/ERC
CHARLOTTE	ACKERMAN COUNTRYMAN	EOPC	1,696	\$ 1,500,000	\$ 19,702,366	\$ 21,202,366	\$ 12,501	\$ 3,750	\$ 16,252	\$ 9,543,352	1,696	\$ 5,627	\$ 1,407	\$ 7,034
CHARLOTTE	SPRING LAKE CONTRACTS A,B,C	2016	2,195	\$ 1,467,000	\$ 19,384,984	\$ 20,851,984	\$ 9,500	\$ 2,850	\$ 12,350					
SARASOTA	PCSSRP: AREA O&P	2015	1,300	\$ 947,810	\$ 11,743,132	\$ 12,690,942	\$ 9,762	\$ 2,929	\$ 12,691	\$ 4,586,121	723	\$ 6,343	\$ 1,586	\$ 7,929
COMPARABLE SIZE PROJECTS Average									\$ 13,764					\$ 7,481
Future Budget Estimate/ERC (2020 Dollars)									\$ 15,000					\$ 7,500

*Soft costs include survey, design, easements, station site cost, legal costs

RECOMMENDED PROGRAM SEQUENCING

There are several options that the City can select to proceed with the overall program. These options include proceeding based on:

- Maximum developed density (conversely based on lowest density)
- Pavement age (installing utilities in the oldest pavement areas first)
- Total project cost (starting with the lowest cost first)

GWE recommends the following sequencing of projects for each of the three options, further described as follows.

PROJECT SEQUENCE – BASED ON DENSITY

If the City decides to proceed based on developed *density* then the recommended sequencing is provided in Table 4.1.

That tabular format is depicted on Map 4.1.

The (29) rows of identified areas are sorted by approximate density % developed. The sort order is “high to low” and outlying high density figures are indicated as a good / attracter parameter. High density areas may be considered “good” with respect to choosing to maximize the number of septic to sewer conversions in selecting an Area for design and construction. Outlying high-density areas include:

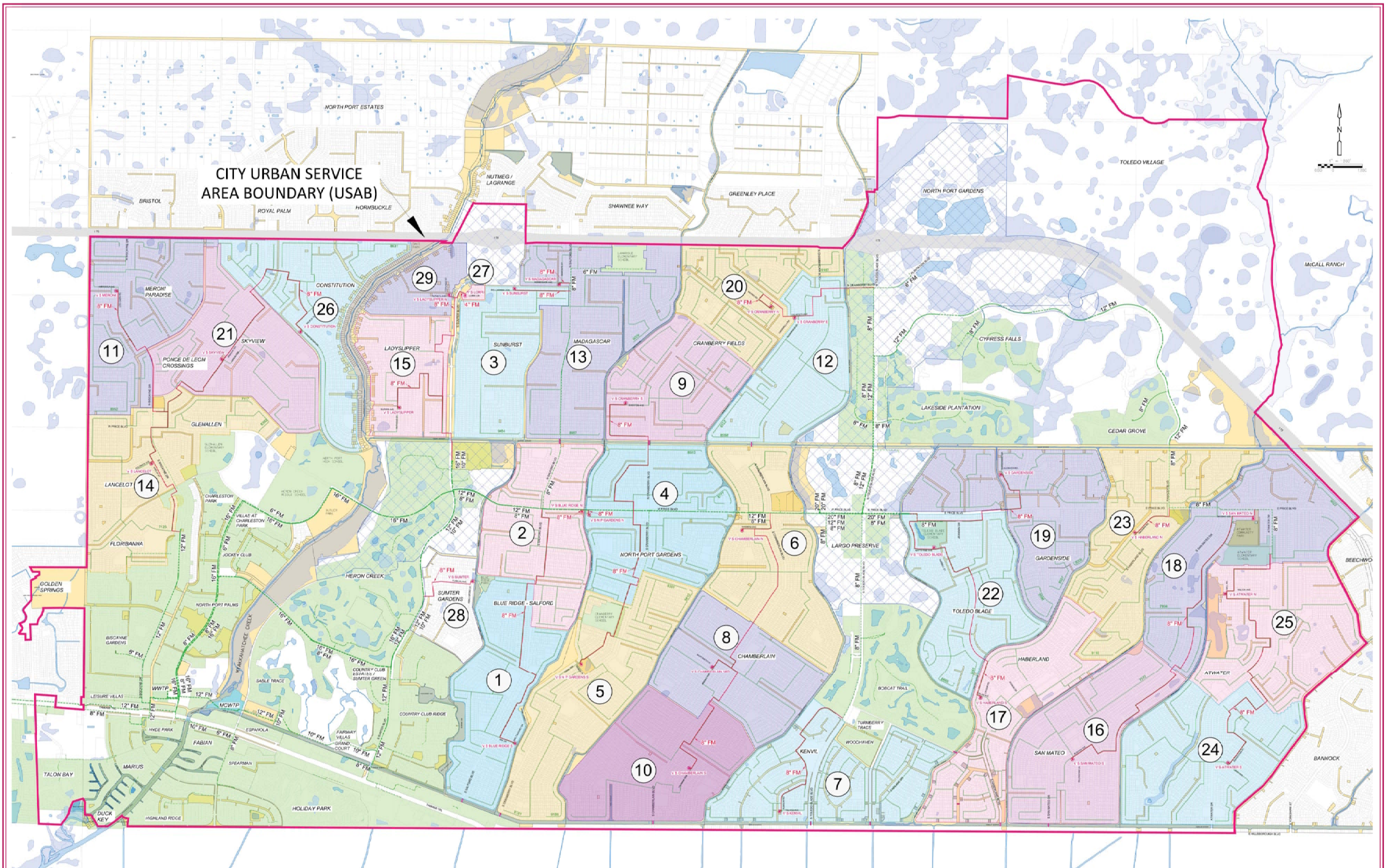
- BLUE RIDGE-SALFORD NORTH (Density 63% Developed)
- BLUE RIDGE-SALFORD SOUTH (Density 70% Developed)

Low density areas may be desirable because the number of homeowners affected by a project would be minimal. Outlying low density areas include:

- ATWATER NORTH (Density 16% Developed)
- ATWATER SOUTH (Density 17% Developed)
- CONSTITUTION * (Density 13% Developed)

All the project sequence tables contain a color coding legend of attracter / detractor parameters, gray shading for *conditionality* where there is a logical construction sequence, and a color code for the (3) small collection areas planned for service by gravity or PAC-VAC System. Note that there are (4) areas (Name *) where Florida Scrub jay permitting *may* affect 20% to 50% of those lots.

Also note that the conditionality of an area is not intended to be a restrictive parameter. A “conditional” project may be engaged out of logical sequence. In that case, work outside of the conditional area would be needed to construct new “pump-out” force main through other collection areas in order to reach an existing point of connection.



CITY URBAN SERVICE
AREA BOUNDARY (USAB)

CITY OF NORTH PORT OVERALL USAB WASTEWATER SEQUENCING PLAN BASED ON DENSITY

LEGEND

- - - EXISTING FORCE MAINS
- 8" FM EXISTING FORCE MAIN SIZE
- VACUUM STATION
- - - PROPOSED FORCE MAINS

LEGEND

- URBAN SERVICE AREA BOUNDARY (USAB)
- AREAS CURRENTLY SEWERED
- CITY OWNED PROPERTY
- ACTIVITY CENTER AREAS
- WETLAND AREAS
- WATER FEATURES
- BRIDGE WITH AERIAL CROSSING

① → ②⑨ HIGHEST TO LOWEST DENSITY

GWE GIFFELS-WEBSTER
ENGINEERS, INC.



PROJECT SEQUENCE BASED ON PAVEMENT AGE

If the City decides to proceed based on pavement age or percent paved, then the recommended sequencing is provided in Table 4.2.

The tabular format in this spreadsheet is also shown as Map 4.2.

The City of North Port has implemented a comprehensive paving program from 2016 to the present, with substantial completion of paving program in 2021. The paving parameter may be considered “unfavorable” for a future collection area, where the area was very recently paved and the expansion project necessarily requires extensive cutting, trenching and restoration of all the roads.

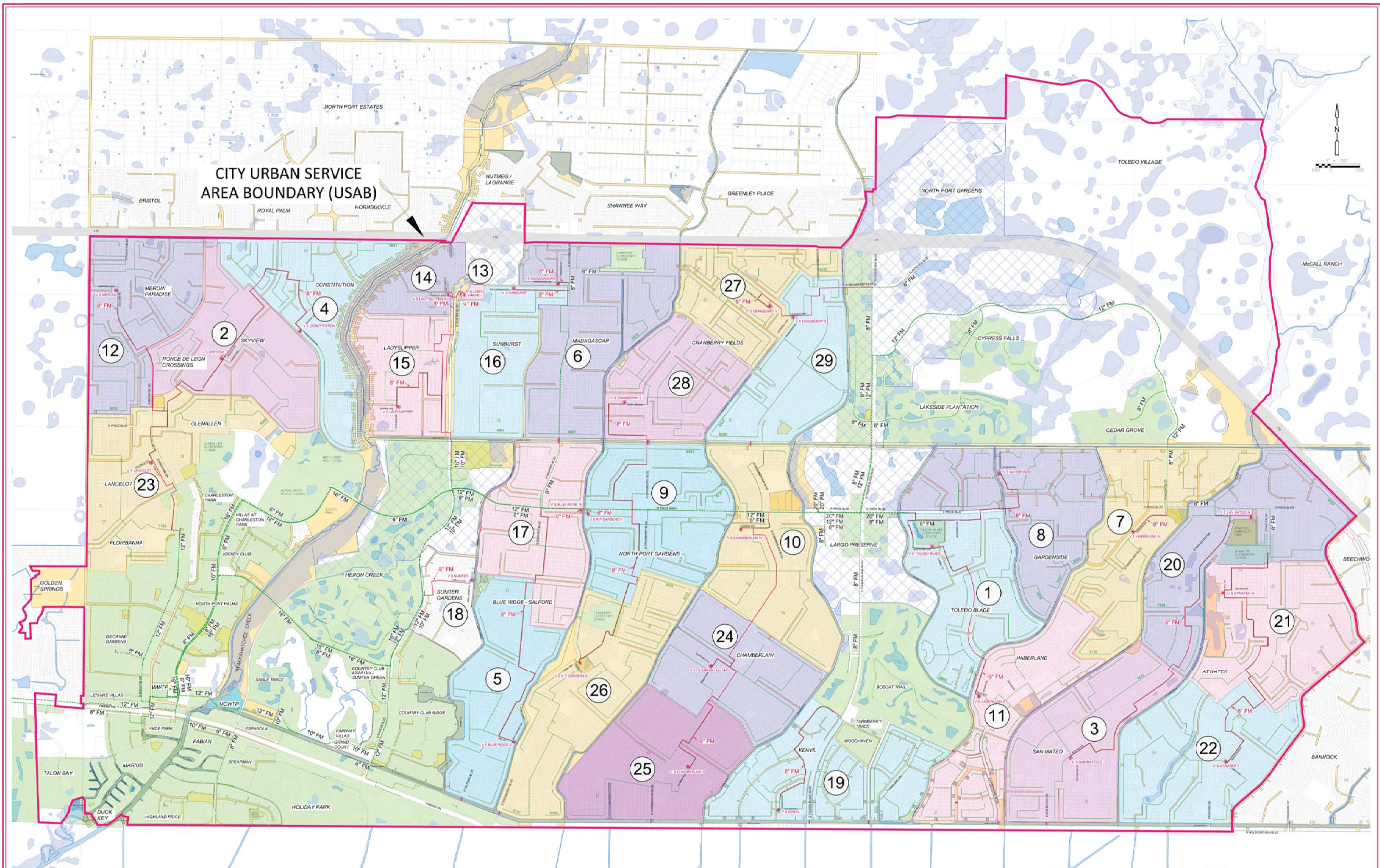
With nearly all of the areas having received at least some road pavement overlay or maintenance paving, consideration is given to the extent (% of roads paved in a given area) as well as the pavement age so that a “good” choice of project work area may affect more of the oldest roadway pavements.

- TOLEDO BLADE (0% new pavement since 2016)
- SKYVIEW/PONCE DE LEON (10% paved in 2016)
- ** SAN MATEO SOUTH (25% paved in 2017)
- CONSTITUTION (30% paved in 2016)
- BLUE RIDGE-SALFORD SOUTH (30% paved in 2016)

** San Mateo from Hillsborough to Price Blvd: new water main & sidewalk under construction in 2020

The following would comprise the “unfavorable” list of very recently paved areas:

- NORTH PORT GARDENS NORTH (to be 100% paved in 2021)
- CHAMBERLIN NORTH (to be 100% paved in 2021)
- CRANBERRY FIELDS EAST (to be 100% paved in 2021)
- CRANBERRY FIELDS NORTH (100% paved in 2020)
- CRANBERRY FIELDS SOUTH (100% paved in 2020)



CITY URBAN SERVICE AREA BOUNDARY (USAB)

CITY OF NORTH PORT OVERALL USAB WASTEWATER SEQUENCING PLAN BASED ON PAVEMENT AGE

- | | |
|---|--|
| <p>LEGEND</p> <ul style="list-style-type: none"> --- EXISTING FORCE MAINS 8" FM EXISTING FORCE MAIN SIZE VACUUM STATION PROPOSED FORCE MAINS | <p>LEGEND</p> <ul style="list-style-type: none"> URBAN SERVICE AREA BOUNDARY (USAB) AREAS CURRENTLY SEWERED CITY OWNED PROPERTY ACTIVITY CENTER AREAS WETLAND AREAS WATER FEATURES BRIDGE WITH AERIAL CROSSING |
|---|--|

1 → 29 OLDEST TO NEWEST PAVEMENT / PERCENT OF NEW PAVEMENT



PROJECT SEQUENCE BASED ON TOTAL COST

If the City decides to proceed based on total construction cost then the recommended sequencing is provided in Table 4.3.

That same information is also provided graphically as Map 4.3.

PROJECT SEQUENCE BASED ON TOTAL COST – (w/ Grouping of small & conditional areas)

Finally, we sequenced based on construction cost but with *conditional grouping* shown in Table 4.4 and provided as Map 4.4.

The grouping can be summarized as:

Collection areas that are independent of adjacent areas to be built first in order to connect the collection area force main to an existing City force main.

Collection areas that need adjacent areas built first, in order to provide a connection point for the collection areas force main.

Smaller projects serving the least number of connections (lots / ERC's) will naturally have a smaller total cost. For areas where potable water main lines and distribution does not exist, the cost to provide water service adds a significant increase to the total cost.

A *conditional* project may be engaged out of logical sequence. In that case, work outside of the conditional area would be needed to construct new “pump-out” force main through other adjacent areas to reach an existing point of connection.

In other words, if the decision is to build an area without the adjacent area being built first, then the cost to build a force main through the adjacent area will need to be *added* to the total cost. However, the significance of force main construction compared to total cost typically represents a relatively small increase (about 2%).

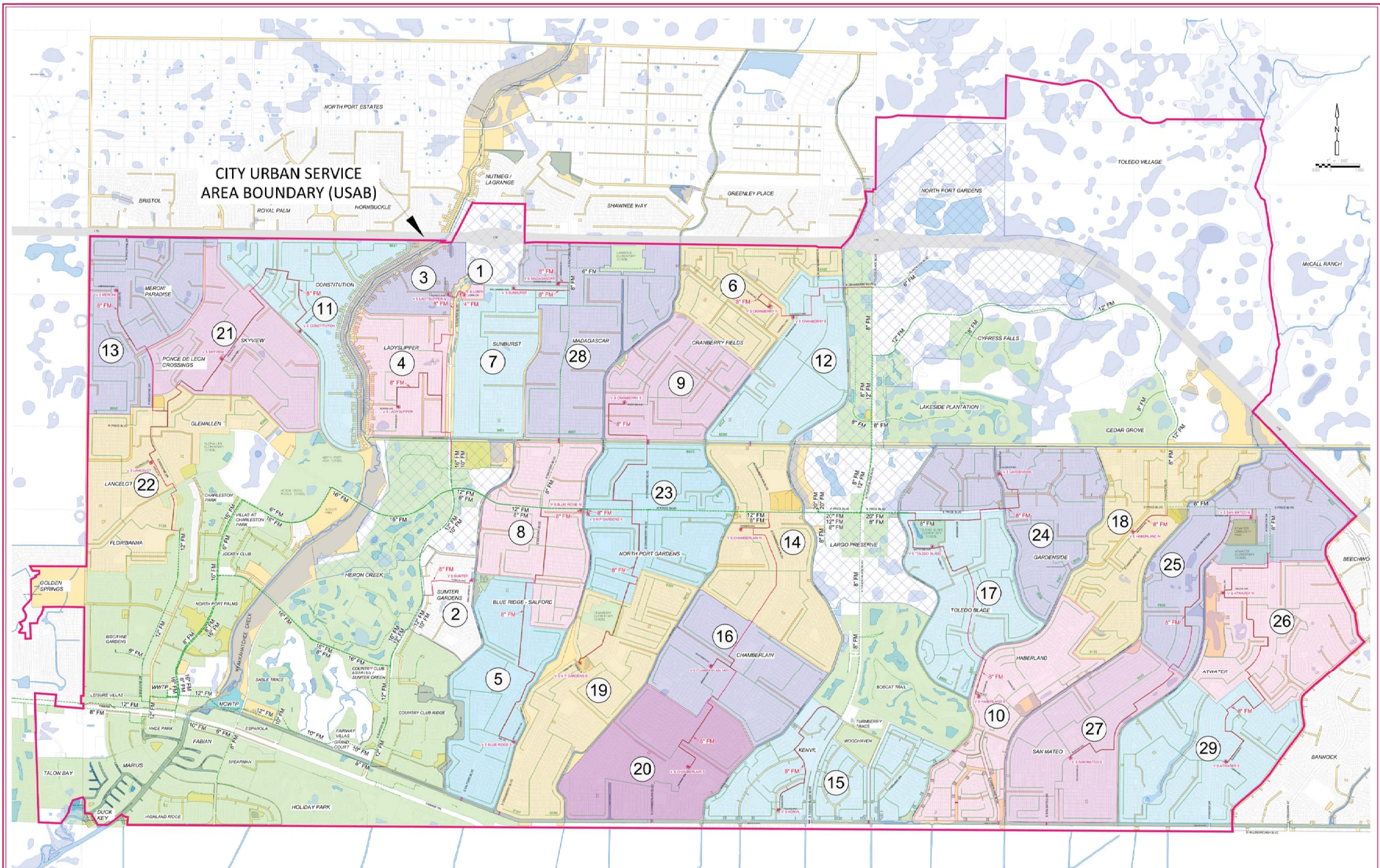
Assuming the adjacent (conditional) area is built first, the following would comprise the lowest water and wastewater construction total cost:

- LADYSLIPPER (\$24.5 M)
- SUNBURST (\$27.9 M)
- BLUE RIDGE-SALFORD NORTH (\$28.5 M)
- CRANBERRY FIELDS SOUTH (\$30.9 M)
- CRANBERRY FIELDS EAST (\$32.5 M)

The following would comprise areas with the highest total cost:

- ** SAN MATEO NORTH (\$41.6 M)
- ATWATER NORTH (\$42.4 M)
- MADAGASCAR (\$43.2 M)
- ** SAN MATEO SOUTH (\$43.2 M)
- ATWATER SOUTH (\$45.5 M)

** San Mateo from Hillsborough to Price Blvd: new water main & sidewalk under construction in 2020



CITY URBAN SERVICE
AREA BOUNDARY (USAB)

CITY OF NORTH PORT
OVERALL USAB WASTEWATER SEQUENCING PLAN
BASED ON COST

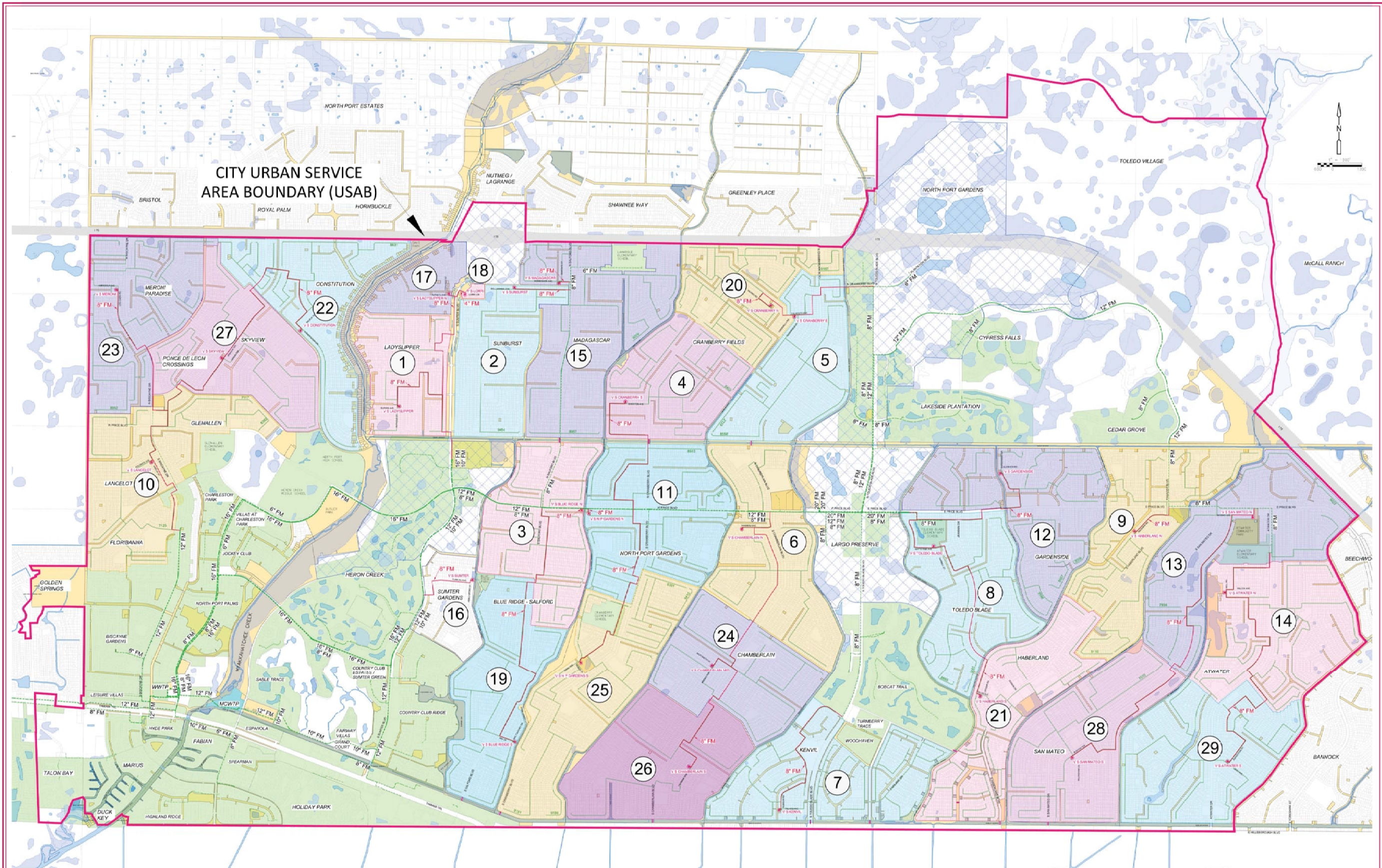
LEGEND
 - - - EXISTING FORCE MAINS
 8" FM EXISTING FORCE MAIN SIZE
 V VACUUM STATION
 - - - PROPOSED FORCE MAINS

LEGEND
 - - - URBAN SERVICE AREA BOUNDARY (USAB)
 - - - AREAS CURRENTLY SEWERED
 - - - CITY OWNED PROPERTY
 - - - ACTIVITY CENTER AREAS
 - - - WETLAND AREAS
 - - - WATER FEATURES
 - - - BRIDGE WITH AERIAL CROSSING

① → ②⑨ LOWEST TO HIGHEST COST

GWE GIFFELS-WEBSTER
ENGINEERS, INC.





CITY URBAN SERVICE AREA BOUNDARY (USAB)

CITY OF NORTH PORT OVERALL USAB WASTEWATER SEQUENCING PLAN BASED ON COST WITH GROUPING

LEGEND

- EXISTING FORCE MAINS
- 8" FM EXISTING FORCE MAIN SIZE
- VACUUM STATION
- PROPOSED FORCE MAINS

LEGEND

- URBAN SERVICE AREA BOUNDARY (USAB)
- AREAS CURRENTLY SEWERED
- CITY OWNED PROPERTY
- ACTIVITY CENTER AREAS
- WETLAND AREAS
- WATER FEATURES
- BRIDGE WITH AERIAL CROSSING

1 → 29 LOWEST TO HIGHEST COST WITH GROUPING



POTABLE WATER MAIN EXPANSION PROJECT SEQUENCE

Currently, more areas in the City have water mains than wastewater mains. However, whenever possible it's generally best to install both wastewater as well as water systems into areas in order to avoid redundant disruption to the roads, minimize mobilization costs, minimize conflicts and enhance the ability coordinate the main and service placement during the construction of both systems with the same contractor.

If the City is to pursue a wastewater expansion program into areas, we recommend the installation of a water distribution system at the same time in order to reduce disruption and conflicts, assuming funds are available.

The sequencing of the water expansion will therefore follow the same sequencing of the wastewater expansion program when that sequencing is determined.

CONCLUSION

This Plan provides the recommended sequencing regardless of whether the City decides to proceed based on density, pavement age, or cost for the City of North Port's future wastewater expansion program.

However, the sequences presented are not necessarily the only possible sequences. The Plan is intended to be flexible as adjustments to master plans are normal and expected. For example, future economic development that are unknown at this time could generate the need to extend wastewater service to specific areas that may be out of our recommended sequence.

There could be other reasons that might alter the sequencing, such as funding sources and availability, the desire to encourage development in specific areas, zoning changes or paving and infrastructure project timing.

Similarly, the precise boundaries of each collection may be adjusted for a variety of reasons. For example, there may be new unforeseen conflicts that reduce the reach of a particular vacuum main. On the other hand extending a main across a road or bridge may be simpler than assumed allowing for an extension. Slight boundary adjustments from the initial Master Plan are normal and expected.