STORMWATER

CAPITAL IMPROVEMENT PLAN







PREPARED FOR:

City of Parker
1001 W. Park Street
Parker, Florida 32404
P: 850.871.4104

www.cityofparker.com

PREPARED ON:

February 13, 2023

PREPARED BY:

Anchor CEI, Inc.
Engineer of Record:
Elizabeth S. Moore, P.E.
President
P.E. 57607
P. 850.215.1285
F. 850.215.1286
450 Magnolia Avenue
Panama City, Florida 32401
www.anchorcei.com

CERTIFICATIONS PAGE

THIS STORMWATER CAPITAL IMPROVEMENTS PLAN HAS BEEN PREPARED UNDER THE DIRECT SUPERVISION OF REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF FLORIDA.

2/14/23

Elizabeth S. Moore, PE

Florida PE No 57607

Table of Contents

Section 1: Introduction

1.1. Executive Summary 1-1

1.2. Scope of Work 1-1

1.3. Project Description 1-2

1.4. Funding Sources 1-2

Section 2: Background & Existing Conditions

2.1. Description of Existing Stormwater System 2-1

2.2. Population of Parker 2-1

2.3. Growth Formula Method 2-2

2.4. Increase in Development Orders 2-2

2.5. Future Demand 2-3

Section 3: Environmental Impacts

3.1. Cultural and Historical Resources 3-1

3.2. Threatened and Endangered Species 3-1

3.3. Wetlands and Critical Habitats 3-1

3.4. Farmlands 3-2

3.5. Surface Water Bodies 3-2

3.6. FEMA Flood Plan 3-2

3.7. Climate 3-3

Section 4: Drainage Areas of Concern

4.1. Marla Drive 4-1

4.2. Lance Street and Camelia Avenue 4-2

4.3. Lake Drive: Arrow Street to 11th Street 4-4
4.4. Teri Lane 4-5
4.5. Indian Summer Avenue & Parker Village Circle 4-6
4.6. Hickory Street 4-8
4.7. Seneca Avenue (North) 4-9
4.8. Seneca Avenue (South) 4-10
4.9. Lake Drive: West Park Street to Highway 22A 4-11
4.10. East Street 4-12
4.11. Thornton Lane and Collins Drive Intersection 4-13
4.12. Moss Street 4-14
4.13. Howard Court 4-15
4.14. Parker City-Wide Storm Drain Improvements Overlap 4-16

Section 5: Stormwater Capital Improvements Plan

5.1. Engineer's Opinion of Probable Construction Cost 5-1
5.2. Proposed Priority Matrix 5-2

Appendices

Appendix A. Florida Natural Areas Inventory Biodiversity Matrix Query Results
Appendix B. Bay County 303(d) Listed Waters
Appendix C. FEMA FIRMETTES of Proposed Site Projects
Appendix D. Summary of Costs and Site-Specific Engineer's Opinion of Probable Construction Cost

SECTION 1 - INTRODUCTION

1.1 – EXECUTIVE SUMMARY

This ***Stormwater Capital Improvements Plan*** was prepared by Anchor Consulting Engineering and Inspection, Inc. (Anchor) on behalf of the City of Parker (City) to identify areas of improvement to increase the efficiency and effectiveness of its stormwater management system. The purpose of this ***Stormwater Capital Improvements Plan*** is to provide recommendations for possible improvements within the City's system and the approximate cost of those improvements.

The City owns and maintains the stormwater management system which serves the residents within the city limits.

The City's service area encompasses the area within the city limits at approximately 2.4 square miles. The City's estimated average service population is 4,545 residents (2019 American Community Survey, U.S. Census). This ***Stormwater Capital Improvements Plan*** identifies stormwater/drainage improvements within the City to reduce existing flooding within areas of the City.

1.2 – SCOPE OF WORK

Anchor was tasked by the City to provide civil engineering services in relation to the Stormwater Capital Improvements Plan. As part of this project, Anchor was to provide the following:

- **Data Collection**: Meet with City staff to determine the areas of immediate concern and other potential long term drainage issues. Obtain and evaluate historical stormwater management plans and existing drainage studies pertaining to the City's stormwater management system which have been prepared by other sources.
- **Contour and Significant Drainage Information Mapping**: Once the areas of concern were identified, identify significant drainage structures within those areas and prepare exhibits depicting locations of these drainage structures, which include aerials and GIS data layers to demonstrate the existing stormwater management system more accurately against planning data, flood zones, water, wastewater, and reuse projects.
- **Baseline Delineation Mapping**: Analyze Bay County GIS information to approximate the drainage basins when formulating the concept design.
- **Stormwater Conceptual Improvement Plan**: Evaluate the information obtained in the previous tasks to determine causes and conceptual solutions to the stormwater issues identified. The results of this analysis are to be provided in concept exhibits that will help demonstrate the different options that can be further evaluated as funding, opportunity or need arises.

- **Stormwater Capital Improvement Plan**: Based on different ranking criteria, present alternative improvement concepts in order of priority. The modifications to the City's stormwater basins may include short-term or long-term improvements, where those improvements are located, and an engineer estimate of probable cost associated with construction. Provide a final recommendation of approval. The Stormwater Capital Improvement Plan will provide order of magnitude pricing for the identified problem areas as well as an evaluation of potential funding sources for the projects identified.

1.3 – PROJECT DESCRIPTION

The City of Parker (City) as well as other surrounding areas in Bay County are experiencing population growth through migration of people to the area which is putting strain on the existing and aging stormwater management system.

The City must adapt, and its infrastructure be updated in order to meet the demands of the growing population as well as the changing landscape and climate. Many of the existing stormwater facilities and practices have been outgrown and overwhelmed by the increasing needs of the area.

Drainage issues were compounded by Hurricane Michael in October 2018, which devastated the entire City as well as some of these stormwater/drainage facilities. These factors have caused increased flooding in many areas throughout the City.

This report is completed to propose improvements to the stormwater management of the entire City with specific emphasis on the problematic areas highlighted by the City of Parker.

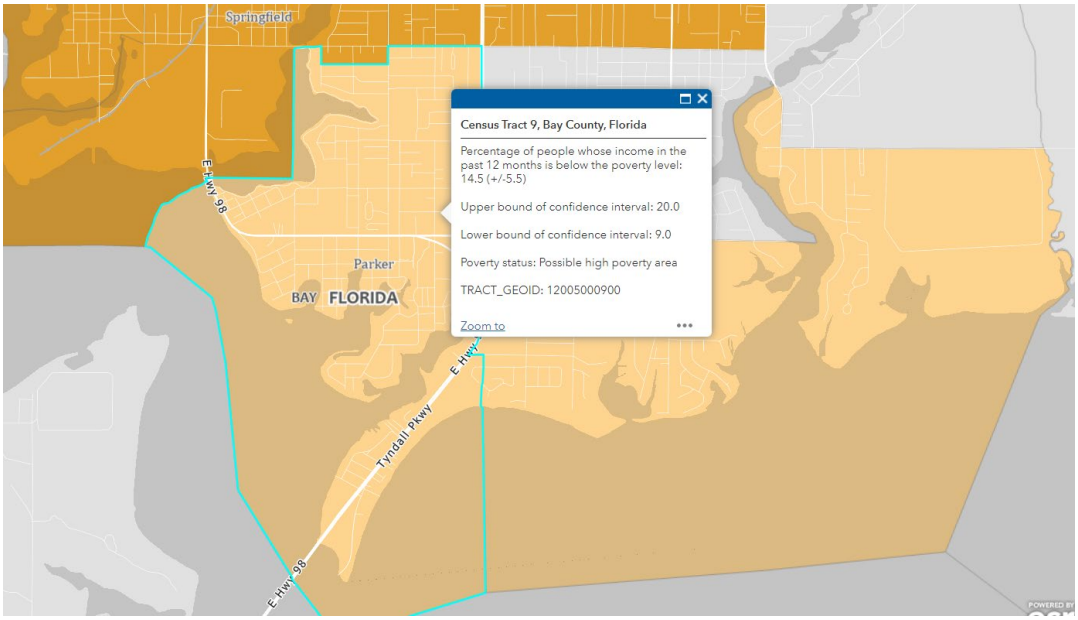
1.4 – FUNDING SOURCES

The City of Parker (City) may be eligible to secure funding for these improvements through various agencies, such as:

- Department of Economic Opportunity – Community Development Block Grant - Disaster Recovery and Neighborhood Revitalization Programs; Rural Community Development Revolving Loan Fund; Rural Infrastructure.
- Federal Emergency Management Agency – Flood Mitigation Assistance Program; Hazard Mitigation Grant Program
- United States Department of Agriculture Rural Development – Rural Business Enterprise Grant.
- Florida Department of Environmental Protection – 313 Program, Clean Water State Revolving Fund (SRF).

It should be noted that those areas of concern that lie in low-income areas of Parker have a better chance of receiving funding. According to the U.S. Census Interactive mapping

for Poverty Status (using ACS19 data). Census Tract 9 (Parker, Florida) indicates that Parker has approximately 14.5 percent of its area considered impoverished and is considered a "possible high poverty area." Because of this, these projects may be eligible for low-income grant funding.



SECTION 2 - BACKGROUND AND EXISTING CONDITIONS

2.1 – DESCRIPTION OF EXISTING STORMWATER SYSTEM

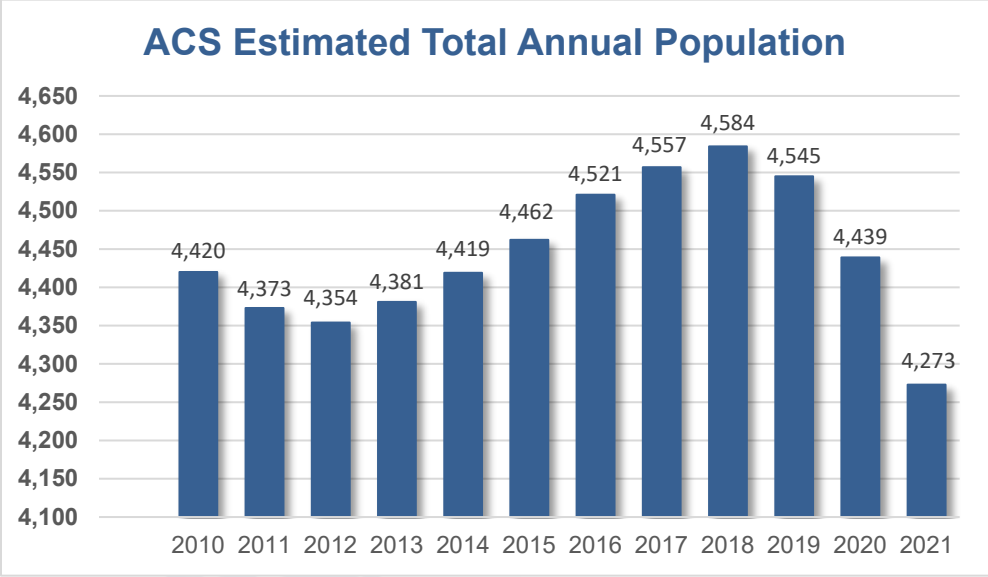
The City of Parker was incorporated in 1967 and is a part of Bay County, Florida. Parker has an area of approximately 1600 acres, which is mostly designated for residential use, with commercial districts designated along U.S. Business 98, South Tyndall Parkway, East U.S. Highway 98, or Bob Little Road.

All of Bay County, including the City of Parker, has been in the process of redevelopment as a result of the catastrophic damage caused by Hurricane Michael in October 2018. Improvements to the existing stormwater management facilities and structures such as retention basins, ditches, drainage pipes, and drainage inlets are needed. Most of these structures drain to the various Bayous along the southern portion of the city limits or Lake Martin Lake in the northwest. Upon investigation, a number of these facilities have either been damaged by the hurricane, have collapsed, or have become filled with sediment and debris. This, alongside increasing development has resulted in increased flooding in many areas throughout the City of Parker.

2.2 – POPULATION OF PARKER

According to data obtained by the U.S. Census – American Community Survey (ACS) from the years from 2010 to 2021, the population was steadily increasing from 2012 to 2018, with an increase of 230 people within 7 years for the small community.

However, October 2018, Hurricane Michael hit as a Category 5 Hurricane and caused devastation to not only Parker, Florida but to Tyndall Air Force Base which is located next to Parker, and many parts of Bay County and Northwest Florida. The population declined after 2018 due to many residents leaving the area to find undamaged and affordable housing.



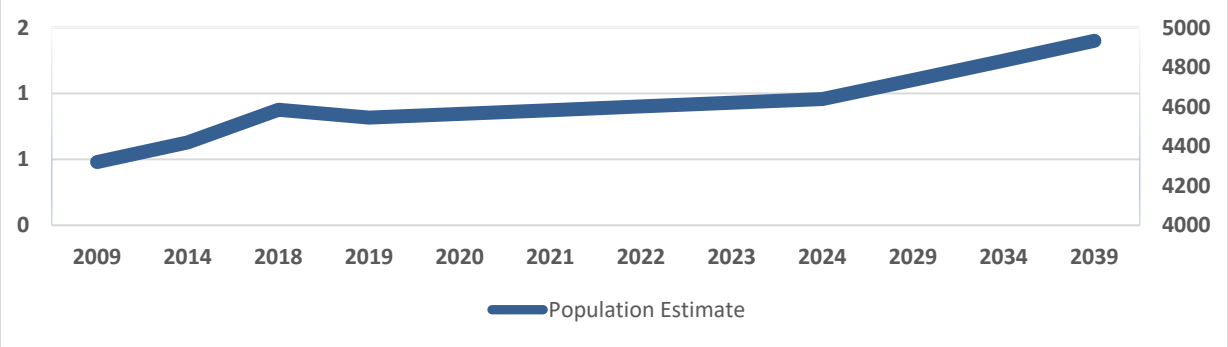
2.3 – ANTICIPATED GROWTH

Because of the COVID-19 related population anomalies in ACS Survey data and because of the decline in the population following Hurricane Michael in 2019, Anchor prepared the growth formula to the Census Data using Data from 2010 to 2018.

The following formula has been used to determine annual percentage growth rate in Parker, Florida.

$$PR = \frac{\frac{VPresent - VPast}{VPast} X\ 100}{N}$$

Figure 2-1
Historic & Projected Population (2009-2039)



2.4 - INCREASE IN DEVELOPMENT ORDERS

One way to determine if a city is growing is to look at the Development Orders being submitted. To determine how many of those are residential units (Minor Developments), multi-family units consisting of duplexes, townhomes, and apartments (Major Developments), and commercial units.

With available full-year data that Anchor has in relation to Development Orders, it was determined that in 2021, 18 Single Family Homes, 1 Mobile Home, 8 Townhome Units, and East Bay Apartments with 270 units were approved. In addition, the redevelopment of 4 Commercial Lots were approved.

In 2022, there were 15 Single Family Homes approved and 4 Commercial Lots were approved.

Currently there is an 18-unit townhome development, and 3 Commercial Lots in review.

This indicates citizens are moving to Parker and building homes, development companies are also seeing the potential in building in Parker as it borders both Panama City and Tyndall Air Force Base and are building townhomes and apartments to accommodate the increase in population and provide stable housing for the residents.

2.5 – FUTURE DEMAND

With the expected increase in population, the stormwater management system within Parker will need to be rehabilitated to ensure public safety. With increased development, modified traffic patterns, changes in general topography can cause changes in the flow of stormwater throughout the area.

SECTION 3 – ENVIRONMENTAL IMPACTS

3.1 – CULTURAL AND HISTORICAL RESOURCES

Negative impacts to any cultural resource or historical sites are not anticipated with this project as this a review and potential rehabilitation of existing stormwater and drainage structures within Parker.

3.2 – THREATENED AND ENDANGERED SPECIES

The proposed drainage improvements will be located primarily within existing road corridors, ditches, and rights of way that do not contain natural vegetation. There are known rare, endangered, or threatened species of vegetation or animals within the City of Parker; however, due to the areas that improvements will occur, it is not anticipated that any will be encountered during rehabilitation.

The Florida Natural Areas Inventory Biodiversity Matrix Query Results for the project area are provided in **Appendix A**. The habitat of likely species indicated in this report is not consistent with the portions of the project area where existing stormwater facilities/drainage structures are located.

Threatened and endangered species may be present at newly acquired properties outside of the current infrastructure. Any improvements which will require development on vacant land will proceed according to all local and state permit requirements. Consultation with Florida Fish and Wildlife and the United States Army Corps of Engineers will be coordinated during the permitting process in order to mitigate potential impacts to threatened or endangered species.

If endangered species are encountered during rehabilitation, the Contractor will be advised to consult with Florida Fish and Wildlife and the United States Army Corps of Engineers to determine mitigation.

3.3 – WETLANDS AND CRITICAL HABITATS

The majority of the improvements proposed herein will be located within areas currently maintained by the City and therefore considered a “de minimis” exemption according to the Florida Department of Environmental Protection (Section 403.813(1)(f) FS). Wetlands encountered within the limits of proposed improvements will be protected from disturbance using directional bores and/or temporarily impacted with open trenches. If wetlands are present near any site, they will be preserved and protected by a 25-foot buffer zone. The exact location and limits of wetland impacts will be identified during design of the project and all necessary coordination with regulatory agencies will be performed throughout the permitting process. Wetland impacts are expected to be temporary and proper minimization, avoidance, and mitigation will be implemented as required.

3.4 – FARMLANDS

Negative impacts to prime or unique farmlands are not anticipated with this project.

3.5 – SURFACE WATER BODIES

Outstanding Florida Waters or Wild and Scenic rivers are not located within the project area. All surface waters within the project area are designated Class 2, 3M, 3F waters, suitable for shellfish propagation and harvesting as well as recreation and for propagation of fish and wildlife in both fresh and marine waters. St. Andrew's Bay and Parker Bayou are both located near portions of the project area. **Appendix B** includes the Bay County 303(d) Listed Waters. The proposed project is not anticipated to negatively impact water quality in surrounding water bodies and should ultimately help mitigate stormwater runoff from entering these surface water bodies.

Appropriate Best Management Practices will be incorporated into both design and construction of the improvements to address stormwater pollution and erosion during project implementation. Once the improvements have been implemented there is very low risk to surface water bodies.

3.6 – FEMA FLOOD PLAIN

Portions of the City of Parker fall within FEMA flood zones A, AE and VE; however, this does not include any electronic controls, pumps, or other infrastructure that may be affected by flood. **Appendix C** contains the FEMA Firmette Maps for the proposed project areas (areas of concern).

A summary of the proposed project areas (areas of concern) and associated flood zones within those immediate areas are detailed below:

1. Marla Drive – Flood Zone X
2. Lance Street and Camelia Avenue – Flood Zone X
3. Lake Drive: Arrow Street to 11th Street – Flood Zone X
4. Teri Lane – Flood Zone X
5. Indian Summer Avenue and Parker Village Circle – Flood Zone X
6. Hickory Street – Flood Zone X
7. Seneca Avenue North – Flood Zone X
8. Seneca Avenue South – Flood Zone X
9. Lake Drive: West Park Street to Highway 22A – Flood Zone X

10. East Street – Partially located within **Flood Zone AE9**
11. Thornton Lane and Collins Drive intersection – Flood Zone X
12. Moss Street – **Flood Zone AE9**
13. Howard Court – Flood Zone X (**if new outfall is constructed below this area, then will be within AE7 and AE8 flood zones**).

As noted above, only two areas of concern have flood zones in the immediate vicinity. However, it should be noted that most, if not all, outfalls lie within flood zones.

3.7 – CLIMATE

The City of Parker is located within Bay County which has a moderate climate. Summers are long, warm, and humid. Winters are generally mild. The Gulf of Mexico moderates the maximum and minimum temperatures. According to the Bay County data provided by the USDA National Water and Climate Center, the average summer temperature is 80˚F and the average daily high is 91˚F. In winter, the average temperature is approximately 53˚F and the average daily minimum is 41˚F. Bay County does experience occasional freezes between the months of November and March, with the lowest historical temperature recorded at 11˚F. The total annual precipitation is about 69 inches. Approximately 34% of the rainfall occurs in the summer. An additional 24% occurs during the months of January, February, and March. The driest months of the year are October, November, and April.

Parker is located slightly inward of the coast; therefore, hurricanes should be considered with regard to climate effects on local infrastructure. Hurricanes in Bay County are most likely to occur between the months of June through November. The City of Parker can and may experience extensive damage due to hurricanes to its stormwater management infrastructure.

SECTION 4 - DRAINAGE AREAS OF CONCERN

In this section, Anchor analyzed areas of concern with the stormwater management and drainage system within Parker. After discussion with the City and review of existing requested updates, the following areas were analyzed for issues/problems with drainage and remedies were suggested for the City's review and approval:

- Marla Drive
- Lance Street and Camelia Avenue
- Lake Drive: Arrow Street to 11th Street
- Teri Lane
- Indian Summer Avenue and Parker Village Circle
- Hickory Street
- Seneca Avenue North
- Seneca Avenue South
- Lake Drive: West Park Street to Highway 22A
- East Street
- Thornton Lane and Collins Drive intersection
- Moss Street
- Howard Court

4.1 – MARLA DRIVE (1-1)

Drainage Issues:

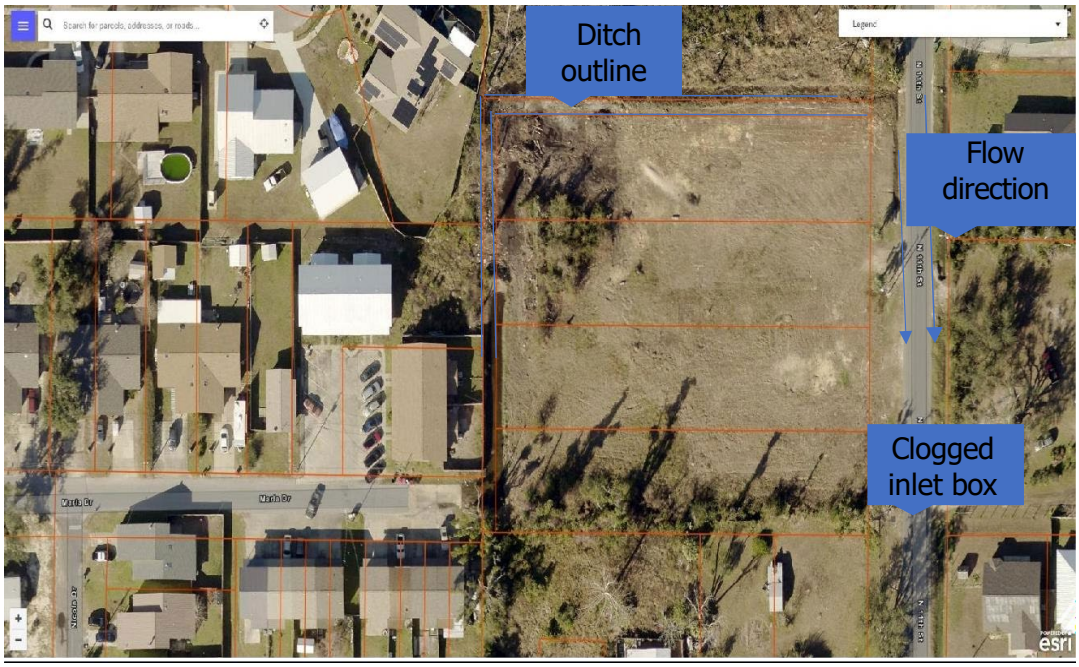
- Erosion and sedimentation along the roadway embankment on North 11th Street, as well as the ditch outlined has standing water and does not effectively drain.
- Runoff from Marla Drive appears to flow from the west toward 11th Street, but the stormwater system is unable to efficiently remove the stormwater causing flooding and potential damage to adjacent properties.
- Inlets along 11th Street appear to be clogged and the side channels are being filled with sediment due to the embankment eroding on one side of the ditch adjacent to the road. This condition is causing sedimentation and is contributing to the drainage issues.

Suggested Remedy:

- Survey the area from Marla and around North 11th Street to determine if the area can be graded to allow drainage and additional storage.
- Excavate the drainageway and stabilize the roadside swales to include erosion control mats or even paved ditches.
- Clean any clogged inlets along 11th Street.

Long-Term Solution:

- Obtain an easement along the south side of 534 North 11th Street and abandon the northern easement.



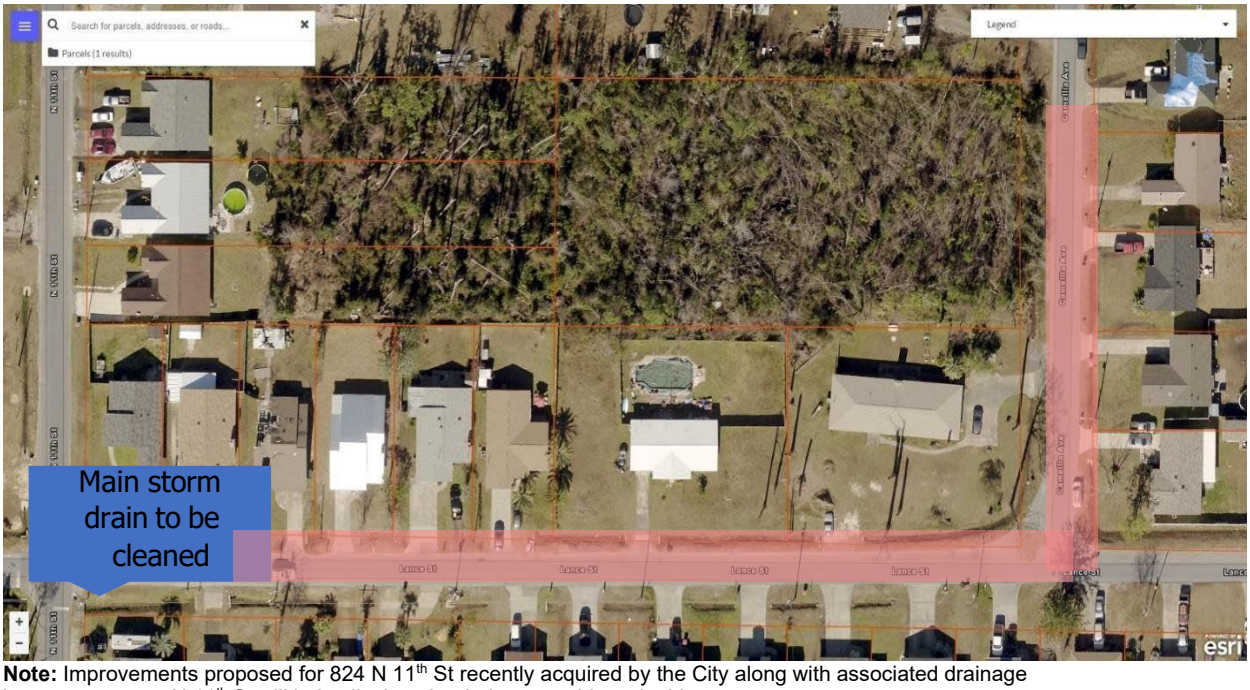
4.2 – LANCE STREET & CAMELLIA AVENUE (1-2 AND 1-8)

Drainage Issues:

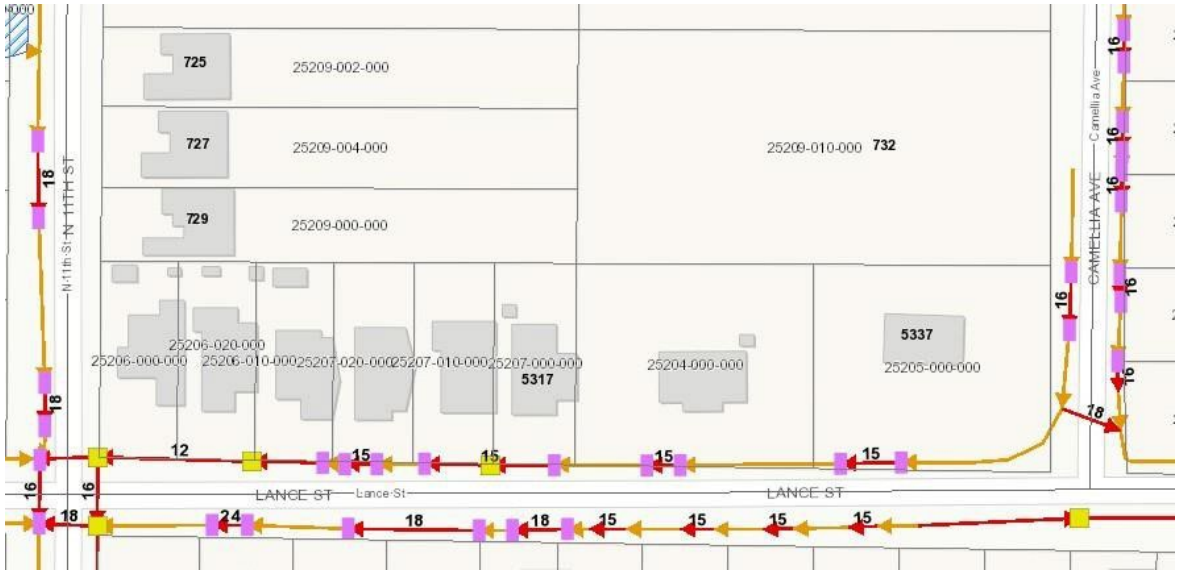
- This area is experiencing increased localized flooding. The roadway, driveways and yards repeatedly hold water after rain events.
- Lance street is a part of the completed ***City-Wide Storm Drain System*** project, which including replacement of 2 concrete headwalls (to match pipe invert elevation), a concrete drive, and 57 linear feet of 18-inch corrugated metal pipe (CMP).

Suggested Remedy:

- Survey the area to determine pipe sizes, materials, and condition of the pipes, which would be used to determine if the elevations of the existing pipes need to be adjusted.
- Increase pipe sizes on the west end of Lance Street near 11th Street.
- Clean and/or modify drainage area as needed once the evaluation is complete.



Note: Improvements proposed for 824 N 11th St recently acquired by the City along with associated drainage improvements on N 11th St will help alleviate the drainage problems in this area.



4.3 – LAKE DRIVE: ARROW STREET TO 11TH STREET (1-3)

Drainage Issue:

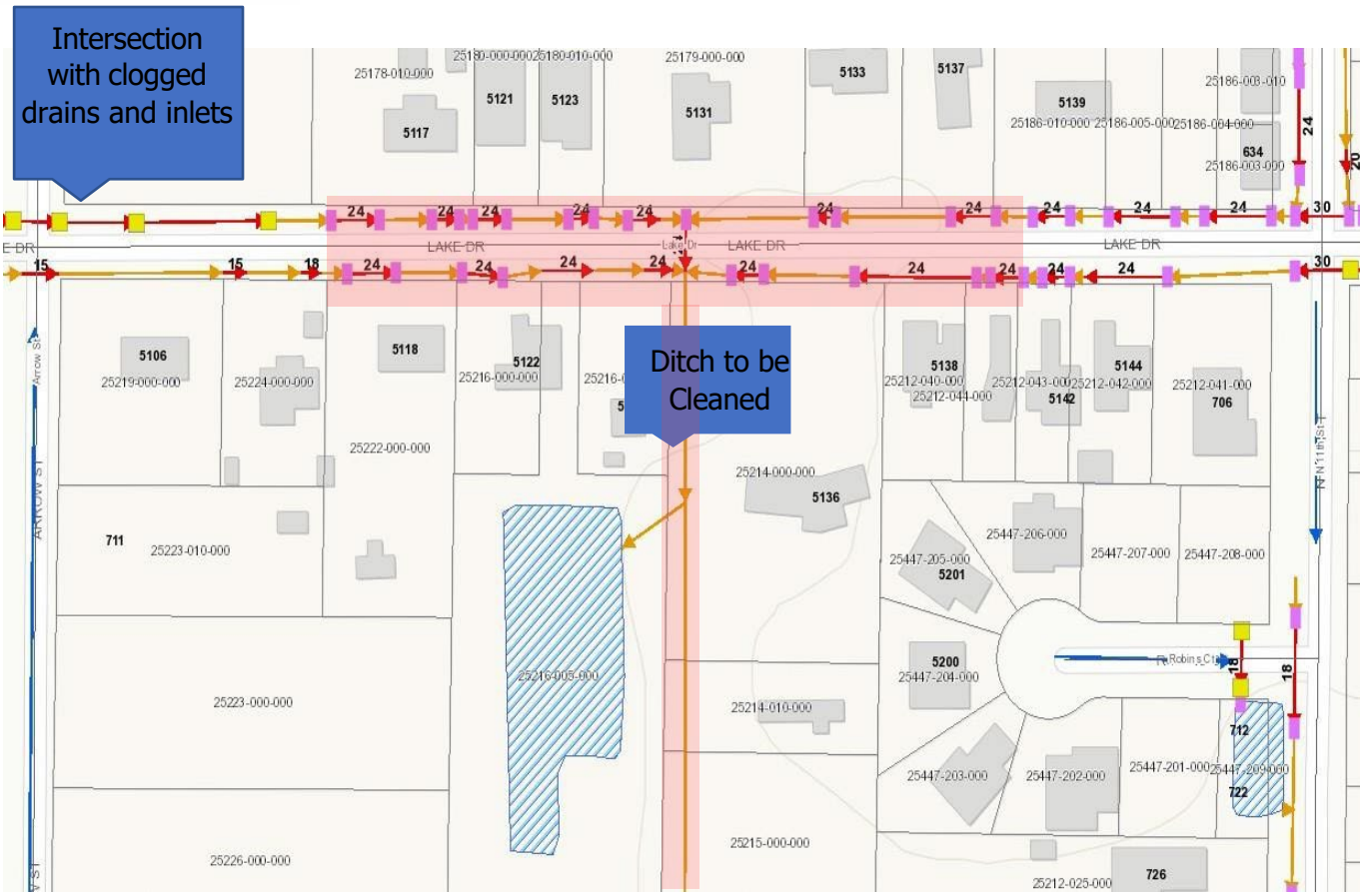
- Stormwater is being collected on both the north and south sides of Lake Drive. The water drains from both the east and the west directions, converging at a cross drain under Lake Drive (approximately 5131 Lake Drive). The water is then pushed south through a ditch to the City-owned and maintained pond located behind 5122 Lake Drive.
- During major rain events the road becomes submerged, and the water rapidly sheet flows across the roadway from the north to the south, overtopping the ditch, filling yards, and causing erosion throughout.
- This is a critical area because it also collects water from North 11th Street, Arrow Street, South Highway 22A, and other adjacent streets.

Suggested Remedy:

- Enlarge and stabilize the ditch connecting the pond to the pond to the Lake Drive system, if possible. This may require obtaining new easements. The ditches along the north and south sides of Lake Drive are fairly deep currently but the ditch running north and south may be contributing to the tailwater condition limiting the effectiveness of the upstream drainage system.
- Evaluate the drainage system and pond to determine if the existing elevations will allow for a deeper system with more storage. A survey of the pond and contributing culverts should be completed as part of this exercise.
- Evaluate the driveway culverts along both sides of Lake Drive to ensure they are adequately sized, clean and able to effectively carry stormwater.
- Conduct a geotechnical evaluation of the Seasonal High-Water Line within the pond area.

Other Things to Consider:

- At the time of our investigation, the inlet boxes and drains at the intersection of Lake Drive and Arrow Street, were clogged. It was also noted that the side drains along Arrow Street were buried.
- This may indicate that these inlets are too low. The suggested survey will help identify the problems contributing to the drainage issues.



Note: The tailwater conditions may contribute to this flooding issue. The improvements proposed for 824 N 11th St will reduce the tailwater condition and allow for better flow on Lake Dr.

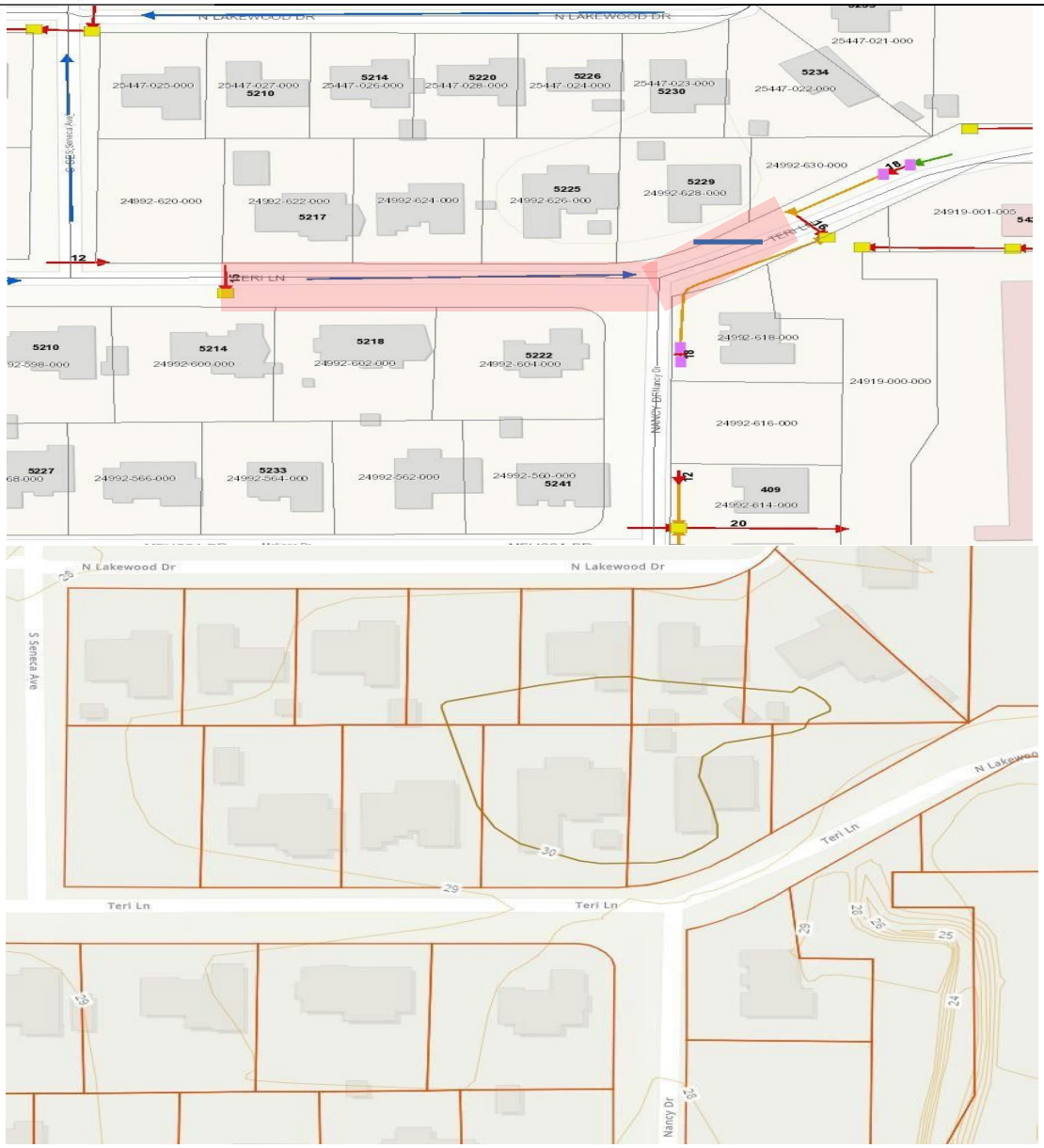
4.4 – TERI LANE (1-4)

Drainage Issue:

- This area collects significant amounts of stormwater with very few drainage structures to help relieve and move the water.

Suggested Remedy:

- Survey the area and the nearest inlets to determine possible locations for drainage improvements.
- Add inlets, drainage pipes and/or swales in these areas, if the elevations allow.



4.5 – INDIAN SUMMER AVENUE & PARKER VILLAGE CIRCLE (1-6 AND 1-7)

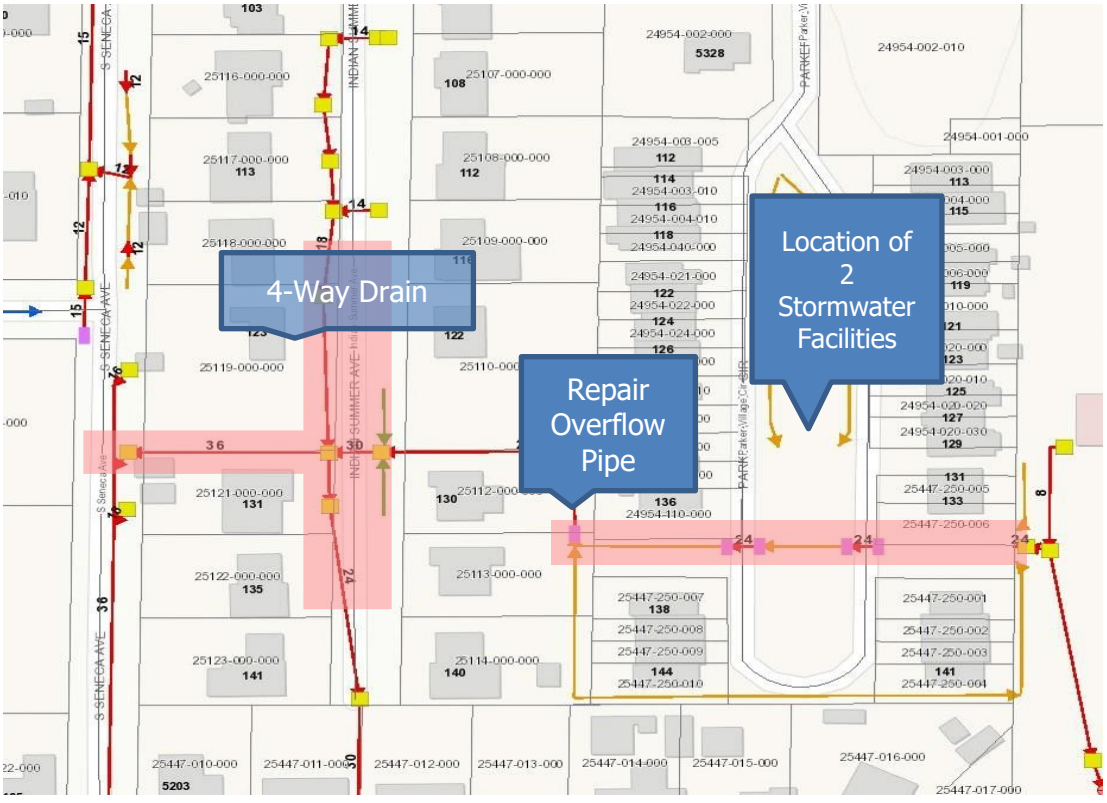
Drainage Issue:

- Inefficient drainage structures cause localized flooding within Parker Village, portions of Indian Summer Road and Seneca Avenue.
- The 4-way drain of Indian Summer Avenue collects stormwater along the street and also stormwater coming from Parker Village Circle and the Winn Dixie Shopping Center.

- A 36-inch pipe (which has the lowest bottom elevation of the 4) carries the stormwater west to Seneca Avenue while a 24-inch pipe (higher elevation than the 36-inch but lower than the two inlet pipes) simultaneous carries stormwater south to the inlet box at the end of Indian Summer Avenue. It is in a low area with no natural exit.

Suggested Remedy:

- Consider increasing the volume of the stormwater facility on Parker Village Circle to decrease the volume flowing through the pipes on Indian Summer Avenue.
- Raise the banks of ditches to improve retention performance.
- Repair the overflow pipe to the west of Parker Village Circle.
- Clean ditches and pipes and determine how much flow is routing through them to Indian Village Circle. This information is needed to verify whether the pipes of the 4-way drain are sufficient to handle the flow received during a critical storm event from all the drainage area accounted for.



Note: Winn Dixie lies immediately to the right of this area and does not appear to be providing any treatment or attenuation for the stormwater runoff being generated from their property.

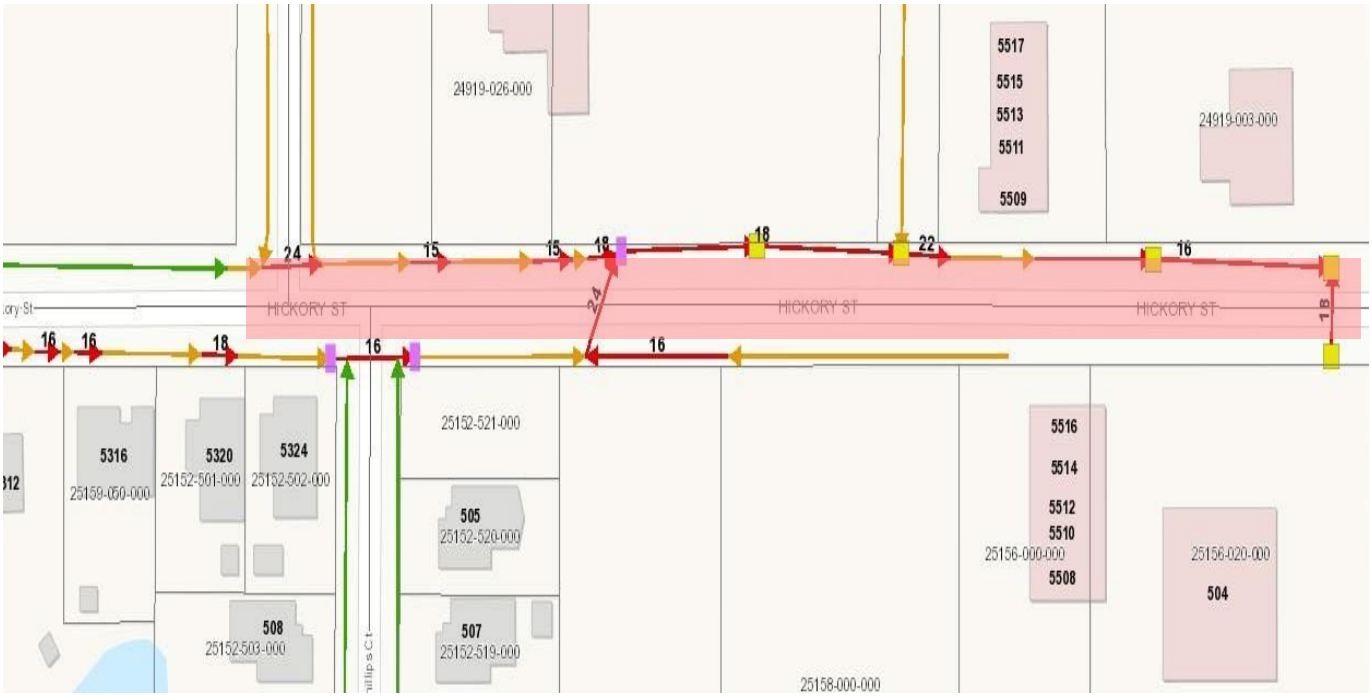
4.6 – HICKORY STREET (1-10)

Drainage Issue:

- This area is subject to repetitive flooding that overtops the ditch banks, submerges the roadway and adjacent properties.
- The drainage system along Tyndall Parkway is over capacity and is unable to drain the area.

Suggested Remedy:

- Investigate and/or record through the pipes through a CCTV camera to determine if and what the pipes are clogged with.
- Clean ditches and pipes.
- Consider rerouting the drainage to provide another outfall. There are multiple easements in this area that could be utilized to direct the stormwater to the south.



ALONG HICKORY STREET

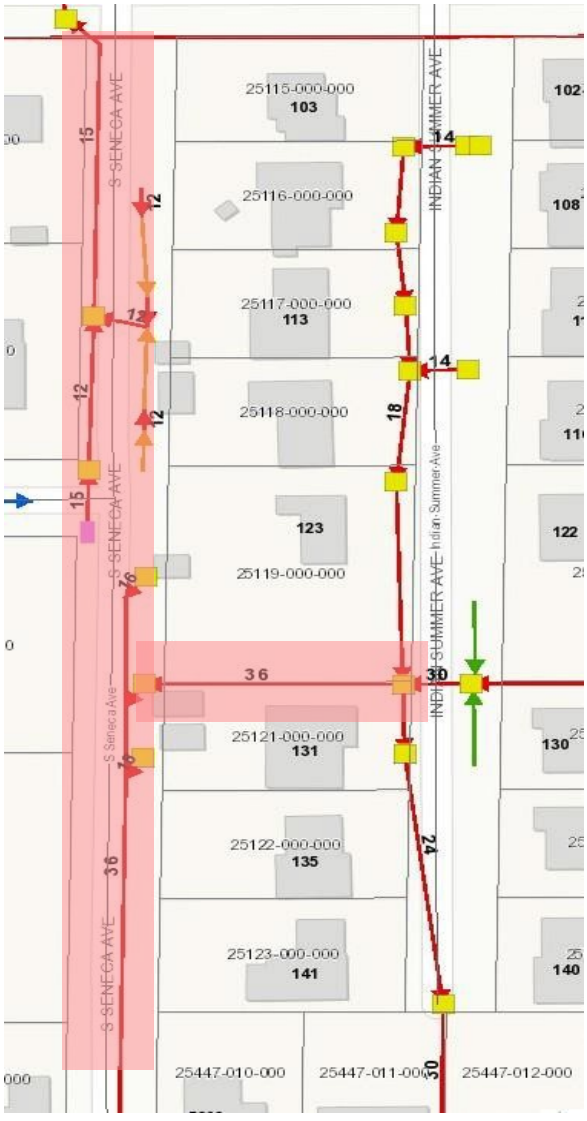
4.7 – SENECA AVENUE (NORTH) (1-14)

Drainage Issue:

- This area contains a significant amount of underground stormwater conveyance. However, the stormwater often overtops the banks causing roadway and property flooding.
- The tailwater condition from the flooded areas to the south are likely to contribute to the localized flooding.

Suggested Remedy:

- Clear the blocked CMPs and swales.
- Replace and/or upsize the CMPs along the road.



CHERRY STREET TO PARK STREET

4.8 – SENECA AVENUE (SOUTH) (1-14)

Drainage Issue:

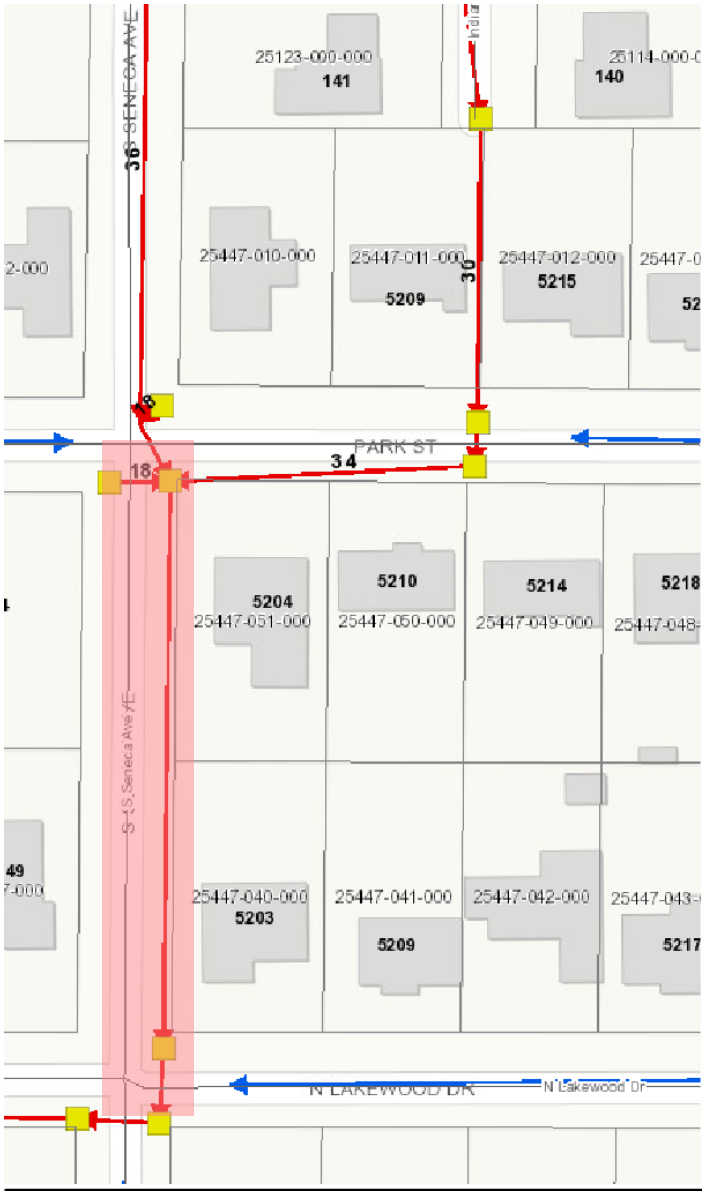
- The area of Seneca Avenue south of Park Street suffers from an extension of the issues affecting the area north of Park Street. This includes roadway and property flooding and underground conveyance issues.

Suggested Remedy:

- Obtain survey data of the roadway and adjacent areas to verify the current drainage and flow. A few inlets appear to be above the elevation of low spots close to the intersection of Park Street and Seneca Avenue.
- Replace existing drainage inlets with gutters or S-inlets to alleviate some of the elevation issues which is a cost-effective solution for the City.

General Solution:

- It is likely that, due to the significant amount of underground/piped conveyance in this basin, the drainage issue could be improved by aggressive cleaning and maintenance followed by the installation of permanent erosion control measures.



PARK STREET TO LAKEWOOD DRIVE

4.9 – LAKE DRIVE: WEST PARK STREET TO HIGHWAY 22A (1-15)

Drainage Issues:

- The roadway and adjacent area are known to flood during significant storm events.
- Due to the lack of drainage and the large contributing area, the roadway acts as a drainage ditch. Over time, the roadway base has become saturated causing significant pavement damage.

Suggested Remedy:

- Clean ditches, inlet boxes and drainage pipes.
- Construct a drainage system that allows the water to flow under the roadway.
- Reconstruct the roadway with a higher structural number and that is less susceptible to movement when submerged such as crushed concrete or crushed shell base.



Note: A significant portion of the drainage issues will be addressed as part of the Lake Drive Improvements Project. In addition, much of Lake Dr was surveyed by Buchan and Harper on 11/5/21 (Job No. 12788 File No E3931.

4.10 – EAST STREET (2-1)

Drainage Issue:

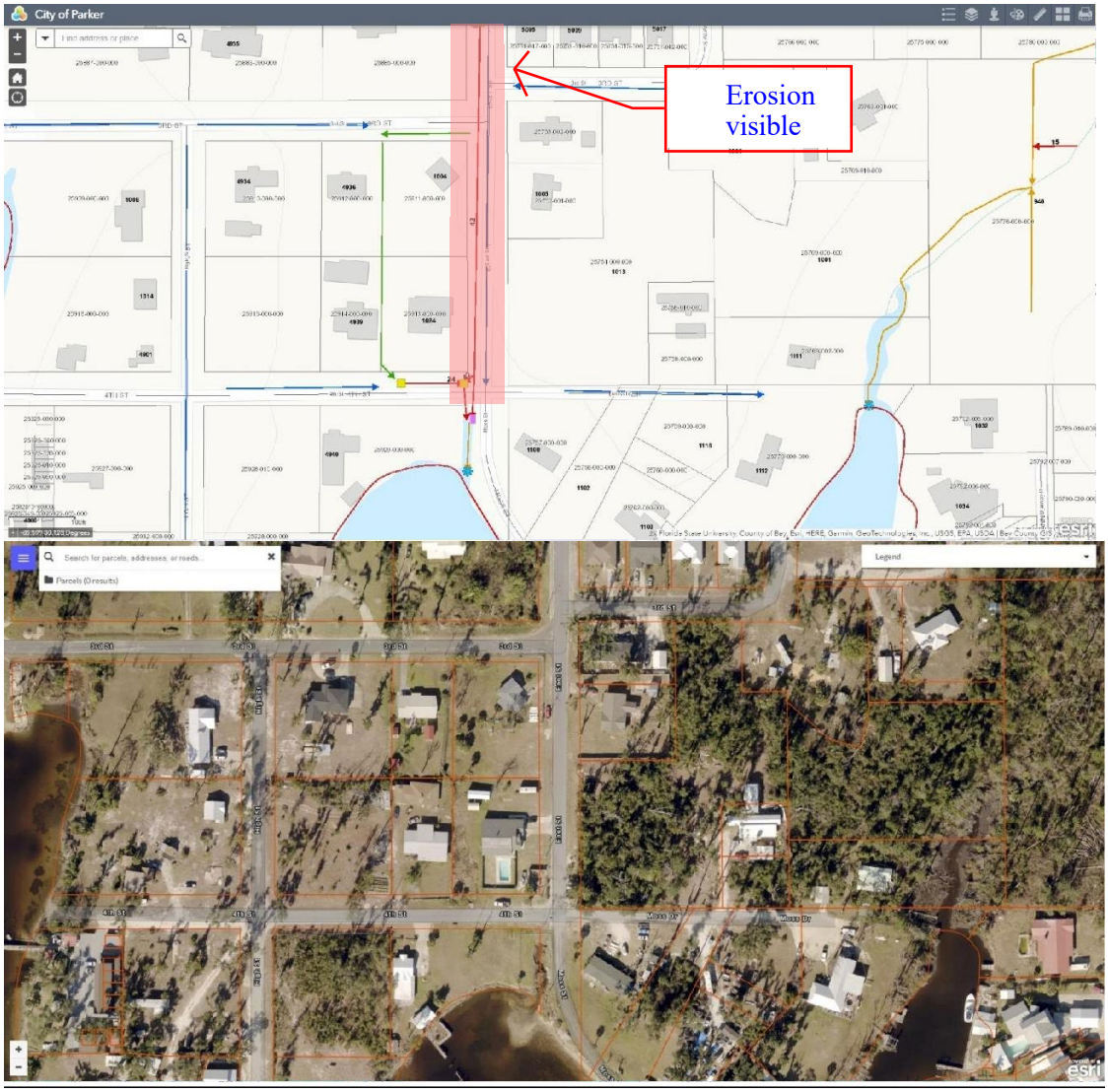
- This area appears to be subject to roadway flooding and ponding.
- Significant erosion around the structure north of 3rd Street on the east side of the road has been noted that could potentially damage structures.

Suggested Remedy:

- Investigate the pipe(s) that are failing with either cameras or site visits and look into repairing/replacing failing drainage pipes.

Other Things to Consider:

- Due to the proximity to the bayou, this project may require additional permitting.



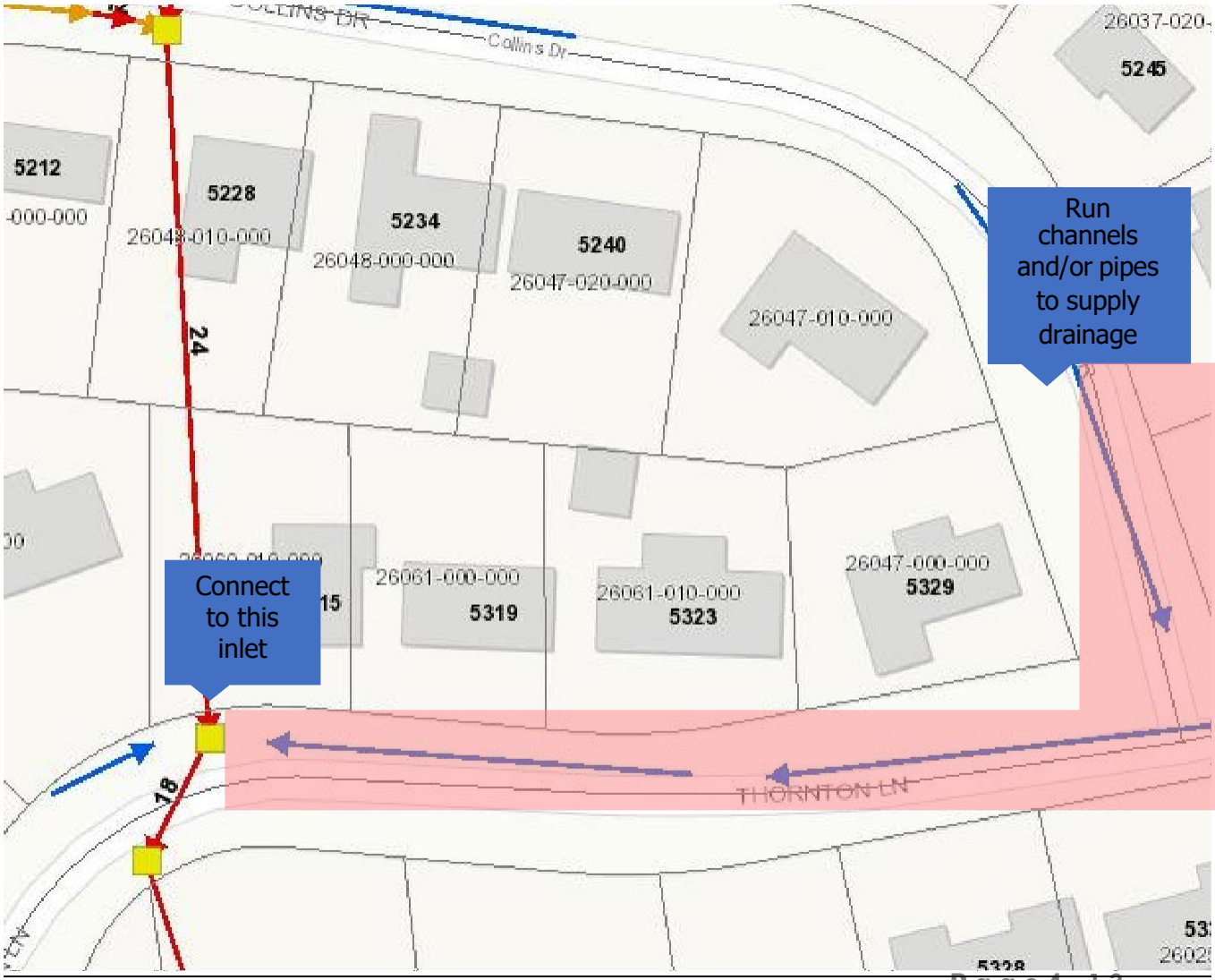
4.11 – THORNTON LANE & COLLINS DRIVE INTERSECTION (2-2)

Drainage Issue:

- Flooding has been observed at the intersection of Thornton Lane and Collins Drive as well as along Thornton Lane.
- No drainage structures or system is present in this area.

Suggested Remedy:

- Consider installing a curb and gutter system within this area or an open ditch/swale system.
- Install drainage ditches and cross drains along Thornton Lane and Collins Drive, then connect to the inlet box by the curve on Thornton Lane. A drainage easement exists west of 5328 Thornton Lane that could be considered during design.



4.12 – MOSS STREET (2-3)

Drainage Issue:

- During significant rainfall events, this drainageway to the east of 1111 Moss Street overtops its banks and will sheet flow across adjacent properties.

Suggested Remedy:

- Clean, enlarge and stabilize the drainage ditch from US Highway 98 to Parker Bayou.
- It should be noted that this effort may require Environmental Permitting.



4.13 – HOWARD COURT (2-5)

Drainage Issue:

- During significant rain events, the roadway and adjacent properties have a tendency to flood.

Suggested Remedy:

- Investigate the catch basin and pipes to determine what caused it to be clogged and where it discharges. Additional downstream improvements may be required. The design should consider the easement adjacent to 122 Howard Court.



4.14 - PARKER CITY-WIDE STORM DRAIN IMPROVEMENTS OVERLAP

A few of the problematic areas originally specified were included in the City-Wide Storm Drain System Improvements project that were recently completed for the City. The drainage issues in these areas may be resolved with the recently completed improvements. These areas are listed below and should be monitored to determine what future improvements may be needed.

- 1-2: Lance Drive
- 1-5: N Lakewood Drive
- 1-9: N 9th Street
- 1-11: Boat Race Road
- 1-13: Nancy Drive
- 2-4: Dover Road and Parkway Drive intersection

In addition, 11th Street/Cherri Lane is currently being rehabilitated and, therefore, was not included in this review.

SECTION 5 – STORMWATER CAPITAL IMPROVEMENT PLAN

5.1 – ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COSTP

In this section, Anchor analyzed and provided an engineer's opinion of probable costs for the following 13 individual areas of concern referenced and detailed in Section 4.

1. Marla Drive
2. Lance Street and Camelia Avenue
3. Lake Drive: Arrow Street to 11th Street
4. Teri Lane
5. Indian Summer Avenue and Parker Village Circle
6. Hickory Street
7. Seneca Avenue North
8. Seneca Avenue South
9. Lake Drive: West Park Street to Highway 22A
10. East Street
11. Thornton Lane and Collins Drive intersection
12. Moss Street
13. Howard Court

Please note the following considerations:

- The pricing is approximate and based on conceptual designs.
- The design can be simplified or expanded once the City chooses a project to start therefore, expect the budget to change.
- Engineer's pricing is based on historical information however the market is experiencing unprecedented escalations and is extremely unpredictable. The pricing contained herein is provided as an order of magnitude for comparison purposes only. The pricing was not obtained by quoting contractor bids and is only based on the experience of Anchor.

Refer to **Appendix D** for an overall summary of costs and individual site-specific cost estimates.

5.2 – PROJECT PRIORITY MATRIX

Anchor analyzed and prepared a priority matrix which included a ranking for each area of concern that included scores for severity, distance to closest geographical outfall, and cost.

Anchor applied weights based on our opinion but that these can be modified if the City suggests otherwise. Severity was weighted by multiplying the below ranking by 50, distance to outfall was weighted by multiplying the below ranking by 30, and cost was weighted by multiplying the below ranking by 20.

	Severity	Distance to Outfall	Cost
Weight	50	30	20
5	Damage to City or Private Property	< 750'	<$150,000
4	Yard Flooding	750-1500	$150,000 - $200,000
3	Roadway Flooding	1500 - 2500	$200,000- $250,000
2	Overtopping Ditches	2500 - 5000	$250,000 - $300,000
1	Nuisance	>5000	$300,000 - $1,000,000

If the City would like to use different weighting criteria, Anchor will provide under the City's recommendations.

It is recommended that the projects be prioritized starting with the ones closest to St. Andrew Bay or Parker Bayou with the intent of working inward. This should eliminate or minimize the downstream tailwater condition.

However, it is recommended that the City modify the priority list as funding opportunities arise or if there is a risk to human health and safety. The priority ranking is found on the following page.

Anchor's ranking recommendation should be adjusted by the City based on factors such as funding or worsening conditions.

RANKING OF PROJECTS
CITY OF PARKER STORWMATER CAPITAL IMPROVEMENTS PLAN

Ranking and Location of Proposed Project		Severity Ranking		Distance to outfall			Estimated Cost			Total
		Ranking	Weighted	Distance	Ranking	Weighted	Cost	Ranking	Weighted	Weighted
1	Lake Drive: West Park Street to Highway 22A	5	250	403.00	5	150	$ 968,590.00	1	20	**420**
2	Teri Lane	5	250	2,701.40	2	60	$ 117,000.00	5	100	**410**
3	Lake Drive: Arrow Street to 11th Street	5	250	2,736.00	2	60	$ 153,800.00	4	80	**390**
4	Lance Street and Camelia Avenue	4	200	3,406.10	2	60	$ 151,800.00	4	80	**340**
5	Hickory Street	4	200	4,487.30	2	60	$ 162,000.00	4	80	**340**
6	East Street	3	150	640.10	5	150	$ 293,500.00	2	40	**340**
7	Seneca Avenue South (Distance is included in Seneca Avenue South)	4	200	-	1	30	$ 103,000.00	5	100	**330**
8	Howard Court	2	100	671.70	5	150	$ 156,000.00	4	80	**330**
9	Thornton Lane and Collins Drive intersection	2	100	999.30	4	120	$ 134,500.00	5	100	**320**
10	Moss Street	2	100	533.20	5	150	$ 240,000.00	3	60	**310**
11	Marla Drive	3	150	4,359.10	2	60	$ 177,725.00	4	80	**290**
12	Indian Summer Avenue and Parker Village Circle	3	150	3,213.60	2	60	$ 197,250.00	4	80	**290**
13	Seneca Avenue North	4	200	5,313.10	1	30	$ 304,000.00	1	20	**250**

Anchor CEI
Engineering that works.

APPENDICES

Anchor CEI
Engineering that works.

Appendix A

Florida Natural Areas Inventory Biodiversity Matrix Query Results

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
850-681-9364 fax
www.fnai.org

Florida Natural Areas Inventory

Biodiversity Matrix Query Results

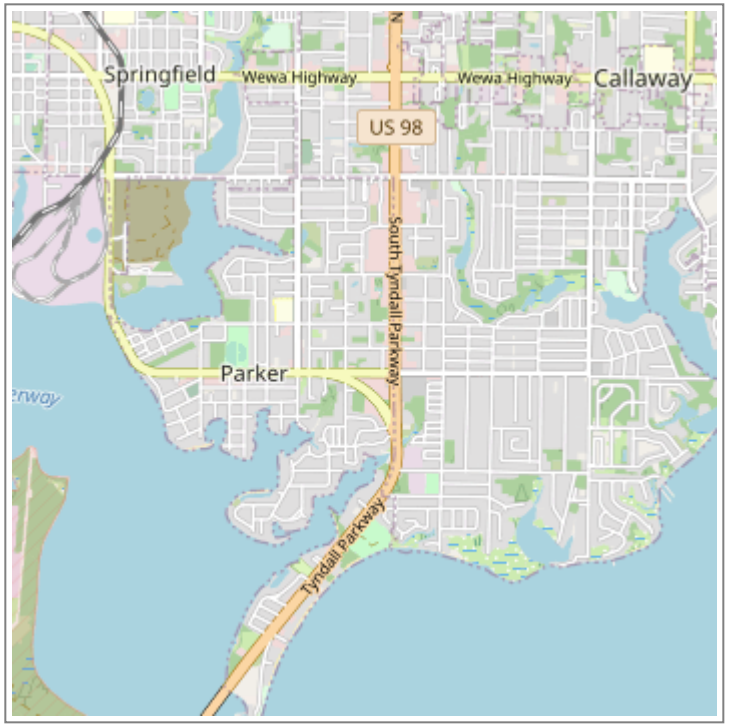
UNOFFICIAL REPORT

Created 2/1/2023

(Contact the FNAI Data Services Coordinator at 850.224.8207 or kbrinegar@fnai.fsu.edu for information on an official Standard Data Report)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 9 Matrix Units: 6185 , 6186 , 6187 , 6260 , 6261 , 6262 , 6337 , 6338 , 6339



Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 6185

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

0 **Likely** Elements Found

Matrix Unit ID: 6186
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

2 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Najas filifolia Narrowleaf Naiad	G3	S2	N	T

Matrix Unit ID: 6187
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Najas filifolia Narrowleaf Naiad	G3	S2	N	T

Matrix Unit ID: 6260
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N

Matrix Unit ID: 6261
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N

Matrix Unit ID: 6262

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Najas filifolia Narrowleaf Naiad	G3	S2	N	T
Ursus americanus floridanus Florida Black Bear	G5T4	S4	N	N

Matrix Unit ID: 6337

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N

Matrix Unit ID: 6338

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

0 **Likely** Elements Found

Matrix Unit ID: 6339

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

2 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Ursus americanus floridanus Florida Black Bear	G5T4	S4	N	N

Matrix Unit IDs: 6185 , 6186 , 6187 , 6260 , 6261 , 6262 , 6337 , 6338 , 6339

39 **Potential** Elements Common to Any of the 9 Matrix Units

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Acipenser oxyrinchus desotoi Gulf Sturgeon	G3T2T3	S2?	T	FT
Ammospiza maritima peninsulae Scott's Seaside Sparrow	G4T3	S3	N	ST
Asclepias viridula southern milkweed	G2	S2	N	T
Calamintha dentata toothed savory	G3	S3	N	T
Calamovilfa curtissii Curtiss' sandgrass	G3	S3	N	T
Charadrius melodus Piping Plover	G3	S2	T	FT
Cuphea aspera Florida waxweed	G2	S2	N	E
Dichanthelium nudicaule naked-stemmed panic grass	G3Q	S3	N	T
Drymarchon couperi Eastern Indigo Snake	G3	S2?	T	FT
Dryobates borealis Red-cockaded Woodpecker	G3	S2	E, PT	FE
Eurybia spinulosa pinewoods aster	G1	S1	N	E
Gentiana pennelliana wiregrass gentian	G3	S3	N	E
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Lachnocaulon digynum pineland bogbutton	G3G4	S3	N	T
Linum westii West's flax	G1	S1	N	E
Lithobates capito Gopher Frog	G2G3	S3	N	N
Lupinus westianus Gulf Coast lupine	G3T3	S3	N	T

Macbridea alba white birds-in-a-nest	G2	S2	T	E
Macranthera flammea hummingbird flower	G3	S2	N	E
Nerodia clarkii clarkii Gulf Salt Marsh Snake	G4T3	S2	N	N
Nuphar advena ssp. ulvacea West Florida cowlily	G5T2	S2	N	N
Nyssa ursina bog tupelo	G3	S3	N	N
Physostegia godfreyi Apalachicola dragon-head	G3	S3	N	T
Pinguicula ionantha Godfrey's butterwort	G2	S2	T	E
Pinguicula primuliflora primrose-flowered butterwort	G3G4	S3	N	E
Platanthera integra yellow fringeless orchid	G3G4	S3	N	E
Polygonella macrophylla large-leaved jointweed	G3	S3	N	T
Rallus longirostris scottii Florida Clapper Rail	G5T3?	S3?	N	N
Rhexia parviflora small-flowered meadowbeauty	G2G3	S2	N	E
Rhexia salicifolia Panhandle meadowbeauty	G3	S3	N	T
Rhododendron austrinum Florida flame azalea	G3	S3	N	E
Rhynchospora crinipes hairy-peduncled beaksedge	G3	S3	N	E
Rudbeckia nitida St. John's blackeyed susan	G3	S2	N	E
Ruellia noctiflora nightflowering wild petunia	G3?	S2	N	E
Scutellaria floridana Florida skullcap	G2	S2	T	E
Stachydeoma graveolens mock pennyroyal	G2G3	S2S3	N	E
Tiedemannia filiformis ssp. greenmanii giant water cowbane	G3	S3	N	E
Xyris isoetifolia Quillwort yellow-eyed grass	G2	S2	N	E
Xyris scabrifolia Harper's yellow-eyed grass	G3	S3	N	T

Disclaimer

The data maintained by the Florida Natural Areas Inventory represent the single most comprehensive source of information available on the locations of rare species and other significant ecological resources statewide. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. FNAI shall not be held liable for the accuracy and completeness of these data, or opinions or conclusions drawn from these data. FNAI is not inviting reliance on these data. Inventory data are designed for the purposes of conservation planning and scientific research and are not intended for use as the primary criteria for regulatory decisions.

Unofficial Report

These results are considered unofficial. FNAI offers a Standard Data Request option for those needing certifiable data.

Appendix B

Bay County
303(d) Listed Waters

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
COMPREHENSIVE VERIFIED LIST OF WATERBODIES - BAY COUNTY (2022)

Cycle	Group	OGC Case Number	Group Name	Planning Unit	County (-ies)	WBID	Water Segment Name	Water-body Type	Water-body Class[1]	1998 303(d) Parameters of Concern	Parameters Assessed Using the Impaired Waters Rule (IWR)	Dissolved Oxygen/Biology Pollutant of Concern	Concentration of Criterion or Threshold Not Met	Priority for TMDL Development[3]	Projected Year For TMDL Development[3]	Verified Period Assessment Data[8]	Comments
1	3	05-1158	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	8013B	Beckrich Road	Beach	3M		Bacteria (Beach Advisories)		< 21 days of beach advisories	Medium	2009		Beach advisories > 21 days/yr for 2003.
2	3	10-0487	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1088	Beatty Bayou	Estuary	2		Fecal Coliform		≤ 43 MPN / 100 mL	Low		vp=8/9	This parameter exceeds the listing threshold and will be added to the 303(d) List.
2	3	10-0504	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1128	Pretty Bayou	Estuary	2		Fecal Coliform		≤ 43 MPN / 100 mL	Low		vp=9/12	This parameter exceeds the listing threshold and will be added to the 303(d) List.
2	3	10-0508	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1136	Watson Bayou	Estuary	3M		Fecal Coliform		≤ 400 Counts / 100 mL	Low		vp=6/15	This parameter exceeds the listing threshold and will be added to the 303(d) List.
2	3	10-0543	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1141B	Parker Bayou	Estuary	2		Fecal Coliform		≤ 43 MPN / 100 mL	Low		vp=6/8	This parameter exceeds the listing threshold and will be added to the 303(d) List.
2	3	10-0510	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1142	Boggy Creek	Stream	2		Fecal Coliform		≤ 43 MPN / 100 mL	Low		vp=21/109	This parameter exceeds the listing threshold and will be added to the 303(d) List.
2	3	10-0511	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1144	Massalina Bayou	Estuary	3M		Fecal Coliform		≤ 400 Counts / 100 mL	Low		vp=8/15	This parameter exceeds the listing threshold and will be added to the 303(d) List.
2	3	10-0515	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1162	Mule Creek	Stream	2		Fecal Coliform		≤ 43 MPN / 100 mL	Low		vp=5/6	This parameter exceeds the listing threshold and will be added to the 303(d) List.
2	3	10-0522	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1209	Eagle Nest Bayou	Estuary	2		Fecal Coliform		≤ 43 MPN / 100 mL	Low		vp=7/23	This parameter exceeds the listing threshold and will be added to the 303(d) List.
2	3	10-0539	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061G	North Bay (North Segment1)	Estuary	2		Bacteria (in Shellfish)		Exceeds Shellfish Evaluation & Assessment Section (SEAS) thresholds	Low		N/A	Listed based on shellfish harvesting classification of conditionally approved by the Shellfish Environmental Assessment Section (SEAS) of the Department of Agriculture.
3	3	19-1040	Choctawhatchee - St. Andrew	Choctawhatchee River	Bay	950	Otter Creek	Stream	3F		Arsenic (in fish tissue)		DOH Fish Tissue Action Level For Recreational Fishermen	Medium		Assessment based on DOH Fish Tissue Studies	This waterbody is impaired for this parameter based on DOH fish consumption advisory data from 2012 for 20 Bluegill with an average arsenic concentration of 0.018 mg/kg. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
1	3	05-1148	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061BB	Carl Gray Park	Beach	3M		Bacteria (Beach Advisories)		< 21 days of beach advisories	Medium	2009		Beach advisories > 21 days/yr for 2001, 2002, and 2003.
1	3	05-1150	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061CB	Beach Drive	Beach	3M		Bacteria (Beach Advisories)		< 21 days of beach advisories	Medium	2009		Beach advisories > 21 days/yr for 2002 and 2003.
1	3	05-1151	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061EB	Delwood	Beach	3M		Bacteria (Beach Advisories)		< 21 days of beach advisories	Medium	2009		Beach advisories > 21 days/yr for 2002 and 2003.
1	3	05-1153	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061FB	Dupont Bridge	Beach	3M		Bacteria (Beach Advisories)		< 21 days of beach advisories	Medium	2009		Beach advisories > 21 days/yr for 2002 and 2003.
3	3	16-0525	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	8015B	East County Line	Beach	3M		Bacteria (Beach Advisories)		< 21 days of beach advisories	HIgh		Beach Advisories 2008 (0 days) 2009 (0 days) 2010 (15 days) 2011 (21 days) 2012 (0 days) 2013 (No Advisories) 2014 (No Advisories) 2015 (No Advisories)	This waterbody is impaired for this parameter because there were 21 days or more of beach advisories in 2011. This is a beach WBID, which are assessed solely on beach advisory information received from DOH.^ This parameter is being added to the 303(d) List.
3	3	16-0529	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	8015F	Sunset Park	Beach	3M		Bacteria (Beach Advisories)		< 21 days of beach advisories	High		Beach Advisories 2008 (7 days) 2009 (7 days) 2010 (0 days) 2011 (49 days) 2012 (0 days) 2013 (No Advisories) 2014 (No Advisories) 2015 (No Advisories)	This waterbody is impaired for this parameter because there were 21 days or more of beach advisories in 2011. This is a beach WBID, which are assessed solely on beach advisory information received from DOH.^ This parameter is being added to the 303(d) List.
20-22	3	22-0581	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1141A	Parker Creek	Stream	3F		Escherichia coli		≤ 410 Counts / 100 mL	High		6/7	This waterbody is impaired for this parameter based on the number of exceedances for the sample size and anthropogenic sources have been identified using land use. Fewer than twenty samples can be used to identify a waterbody as impaired if there are at least five exceedances, per 62-303.390(2)(f) F.A.C. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
20-22	3	22-0563	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061B	St Andrew Bay (North Segment)	Estuary	2		Enterococci		≤ 130 Counts / 100 mL	High		25/150	This waterbody is impaired for this parameter based on the number of exceedances for the sample size. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
20-22	3	22-0564	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061C	St Andrew Bay (Middle Segment)	Estuary	3M		Enterococci		≤ 130 Counts / 100 mL	High		28/154	This waterbody is impaired for this parameter based on the number of exceedances for the sample size and anthropogenic sources have been identified using land use. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
20-22	3	22-0580	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1128	Pretty Bayou	Estuary	2		Enterococci		≤ 130 Counts / 100 mL	High		5/18	This waterbody is impaired for this parameter based on the number of exceedances for the sample size and anthropogenic sources have been identified using land use. Fewer than twenty samples can be used to identify a waterbody as impaired if there are at least five exceedances, per 62-303.390(2)(f) F.A.C. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
20-22	3	22-0577	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1111A	Sandy Creek (Shellfish Portion)	Estuary	2		Fecal Coliform (3)		≤ 14 MPN/100 mL	Medium		Impaired	This waterbody is impaired for this parameter based on the number of exceedances for the sample size. The waterbody includes at least one sampling location (21FLSEAS12SEAS976 / Mouth of Sandy Creek) that has a median fecal coliform MPN value that exceeds 14 counts per 100 ml for the verified period. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
3	3	16-0485	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1086	Mill Bayou	Estuary	2		Fecal Coliform		≤ 43 MPN / 100 mL	Low		5/25	This waterbody is impaired for this parameter based on the number of exceedances for the sample size and is being added to the 303(d) List.
3	3	16-0486	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1111A	Sandy Creek (Shellfish Portion)	Estuary	2		Fecal Coliform		≤ 43 MPN / 100 mL	Low		11/38	This waterbody is impaired for this parameter based on the number of exceedances for the sample size and is being added to the 303(d) List.
3	3	16-0487	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1142A	Boggy Creek (Shellfish Portion)	Estuary	2		Fecal Coliform		≤ 43 MPN / 100 mL	Low		9/10	This waterbody is impaired for this parameter based on the number of exceedances for the sample size. Fewer than twenty samples can be used to identify a waterbody as impaired if there are at least five exceedances, per Rule 62-303.420(7)(a) F.A.C. This parameter will be added to the 303(d) List.
20-22	3	22-0579	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1123	Robinson Bayou	Estuary	2		Fecal Coliform		≤ 43 MPN/100 mL	Medium		5/8	This waterbody is potentially impaired for this parameter based on the number of exceedances for the sample size and anthropogenic sources have been identified using land use. Fewer than twenty samples can be used to identify a waterbody as impaired if there are at least five exceedances, per 62-303.390(2)(f) F.A.C. Additionally, the delisting that occurred in the previous cycle was erroneous, as there was no Fecal Coliform TMDL. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
COMPREHENSIVE VERIFIED LIST OF WATERBODIES - BAY COUNTY (2022)

Cycle	Group	OGC Case Number	Group Name	Planning Unit	County (-ies)	WBID	Water Segment Name	Water-body Type	Water-body Class[1]	1998 303(d) Parameters of Concern	Parameters Assessed Using the Impaired Waters Rule (IWR)	Dissolved Oxygen/Biology Pollutant of Concern	Concentration of Criterion or Threshold Not Met	Priority for TMDL Development[3]	Projected Year For TMDL Development[3]	Verified Period Assessment Data[8]	Comments
20-22	3	22-0641	Choctawhatchee - St. Andrew	Choctawhatchee River	Bay	950	Otter Creek	Stream	3F		Iron		≤ 1.0 mg/L	Medium		6/25	This waterbody is impaired for this parameter based on the number of exceedances for the sample size. Fewer than twenty samples can be used to identify a waterbody as impaired if there are at least five exceedances, per 62-303.420(7)(a) F.A.C. After further investigation, FDEP cannot rule out the possibility of anthropogenic sources. This parameter will remain on the Verified List and the 303(d) List.
3	3	16-0479	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061A	West Bay	Estuary	2		Fecal Coliform (SEAS Classification)		Exceeds Shellfish Evaluation & Assessment Section (SEAS) thresholds	High		Impaired	This waterbody is listed as impaired for this parameter because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section (SEAS) of the Department of Agriculture and Consumer Services. This parameter is being added to the Verified List.
1	3	05-1152	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061F	East Bay (E)	Estuary	2		Bacteria (in Shellfish)		Exceeds SEAS thresholds	Medium	2009		PP = 270 / 2799; VP = 73 / 1188. This WBID was listed because there was a downgrade in the shellfish harvesting classification for some portion of this Class II waterbody.
3	3	16-0483	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061H	North Bay (North Segment2)	Estuary	2		Fecal Coliform (SEAS Classification)		Exceeds Shellfish Evaluation & Assessment Section (SEAS) thresholds	High		Impaired	This waterbody is listed as impaired for this parameter because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section (SEAS) of the Department of Agriculture and Consumer Services. This parameter is being added to the Verified List.
20-22	3	22-0562	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1053A	Warrens Bayou	Estuary	2		Fecal Coliform (SEAS Classification)		Exceeds Shellfish Environmental Assessment Section (SEAS) thresholds	High		NA	This waterbody is listed as impaired for this parameter because the shellfish harvesting classification is not fully approved by the Shellfish Harvest Area Classification Program of the Department of Agriculture and Consumer Services. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
20-22	3	22-0568	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1086	Mill Bayou	Estuary	2		Fecal Coliform (SEAS Classification)		Exceeds Shellfish Environmental Assessment Section (SEAS) thresholds	High		NA	The shellfish harvesting classification of Prohibited, assigned to this WBID by the Shellfish Harvest Area Classification Program of the Florida Department of Agriculture and Consumer Services, is based on an administrative decision as a precautionary measure, and not water quality data. However, Fecal Coliform water quality data also indicate a bacteria problem in the current assessment period. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
20-22	3	22-0569	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1088	Beatty Bayou	Estuary	2		Fecal Coliform (SEAS Classification)		Exceeds Shellfish Environmental Assessment Section (SEAS) thresholds	High		NA	The shellfish harvesting classification of Prohibited, assigned to this WBID by the Shellfish Harvest Area Classification Program of the Florida Department of Agriculture and Consumer Services, is based on an administrative decision as a precautionary measure, and not water quality data. However, Fecal Coliform water quality data also indicate a bacteria problem in the current assessment period. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
20-22	3	22-0578	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1111A	Sandy Creek (Shellfish Portion)	Estuary	2		Fecal Coliform (SEAS Classification)		Exceeds Shellfish Environmental Assessment Section (SEAS) thresholds	High		NA	The shellfish harvesting classification of Prohibited, assigned to this WBID by the Shellfish Harvest Area Classification Program of the Florida Department of Agriculture and Consumer Services, is based on an administrative decision as a precautionary measure, and not water quality data. However, Fecal Coliform water quality data also indicate a bacteria problem in the current assessment period. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
20-22	3	22-0582	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1141B	Parker Bayou	Estuary	2		Fecal Coliform (SEAS Classification)		Exceeds Shellfish Environmental Assessment Section (SEAS) thresholds	High		NA	This waterbody is listed as impaired for this parameter because the shellfish harvesting classification is not fully approved by the Shellfish Harvest Area Classification Program of the Department of Agriculture and Consumer Services. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
20-22	3	22-0583	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1171	California Bayou	Estuary	2		Fecal Coliform (SEAS Classification)		Exceeds Shellfish Environmental Assessment Section (SEAS) thresholds	High		NA	This waterbody is listed as impaired for this parameter because the shellfish harvesting classification is not fully approved by the Shellfish Harvest Area Classification Program of the Department of Agriculture and Consumer Services. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
20-22	3	22-0586	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1230	Walker Bayou	Estuary	2		Fecal Coliform (SEAS Classification)		Exceeds Shellfish Environmental Assessment Section (SEAS) thresholds	High		NA	This waterbody is listed as impaired for this parameter because the shellfish harvesting classification is not fully approved by the Shellfish Harvest Area Classification Program of the Department of Agriculture and Consumer Services. This parameter is being added to the Verified List and the department is requesting EPA add it to the 303(d) List.
3	3	16-0481	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061F	East Bay (East Segment)	Estuary	2		Nutrients (Total Nitrogen)		ENRN1: AGM ≤ 0.33 mg/L	Medium		ENRN1: AGM 2008 (0.34 mg/L) 2009 (0.31 mg/L) 2010 (0.26 mg/L) 2011 (0.27 mg/L) 2012 (0.44 mg/L) 2014 (0.47 mg/L)	This waterbody is impaired for this parameter because the annual geometric means exceeded the criterion more than once in the most recent consecutive three year period. This parameter is being added to the 303(d) List.
3	3	16-0484	Choctawhatchee - St. Andrew	St. Andrews Bay	Bay	1061H	North Bay (North Segment2)	Estuary	2		Nutrients (Total Nitrogen)		ENRN2: AGM ≤ 0.28 mg/L	Medium		ENRN2: AGM 2008 (0.31 mg/L) 2009 (0.26 mg/L) 2010 (0.29 mg/L) 2011 (0.23 mg/L) 2012 (0.37 mg/L) 2014 (0.31 mg/L)	This waterbody is impaired for this parameter because the annual geometric means exceeded the criterion more than once in the most recent consecutive three year period. This parameter is being added to the 303(d) List.

[1] Florida's waterbody classifications are defined as:
1 - Potable water supplies
2 - Shellfish propagation or harvesting
3F - Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife in fresh water
3M - Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife in marine water
4 - Agricultural water supplies
5 - Navigation, utility, and industrial use

[3] Where a parameter was identified as impaired under the IWR, a priority of "medium" was assigned. Exceptions are waters where the impairment poses a threat to potable water or human health, which have been assigned a "high" priority, and fecal coliform impairments, which have been assigned a "low" priority. All other listings are prioritized based on the following: it is our intent that listings with a "High" priority be addressed within the next 5 years, listings with a "Medium" priority be addressed within 5-10 years as resources allow, and listings with a "Low" priority be addressed within the next 10 years.

[8] **VP** - Verified Period (7.5 year period; beginning and ending date vary by group/cycle combination); Where data are presented as x/y, x represents the number of exceedances and y represents the total number of samples.

N/A = Not Applicable, does not apply, or was not assessed in the previous cycle (i.e. it's a new WBID, waterbody type change, etc.).

^ Beach advisories are based on FL Dept of Health Enterococcus criterion of >103 CFU/100mL.

Appendix C

FEMA

FIRMettes

Appendix C-1

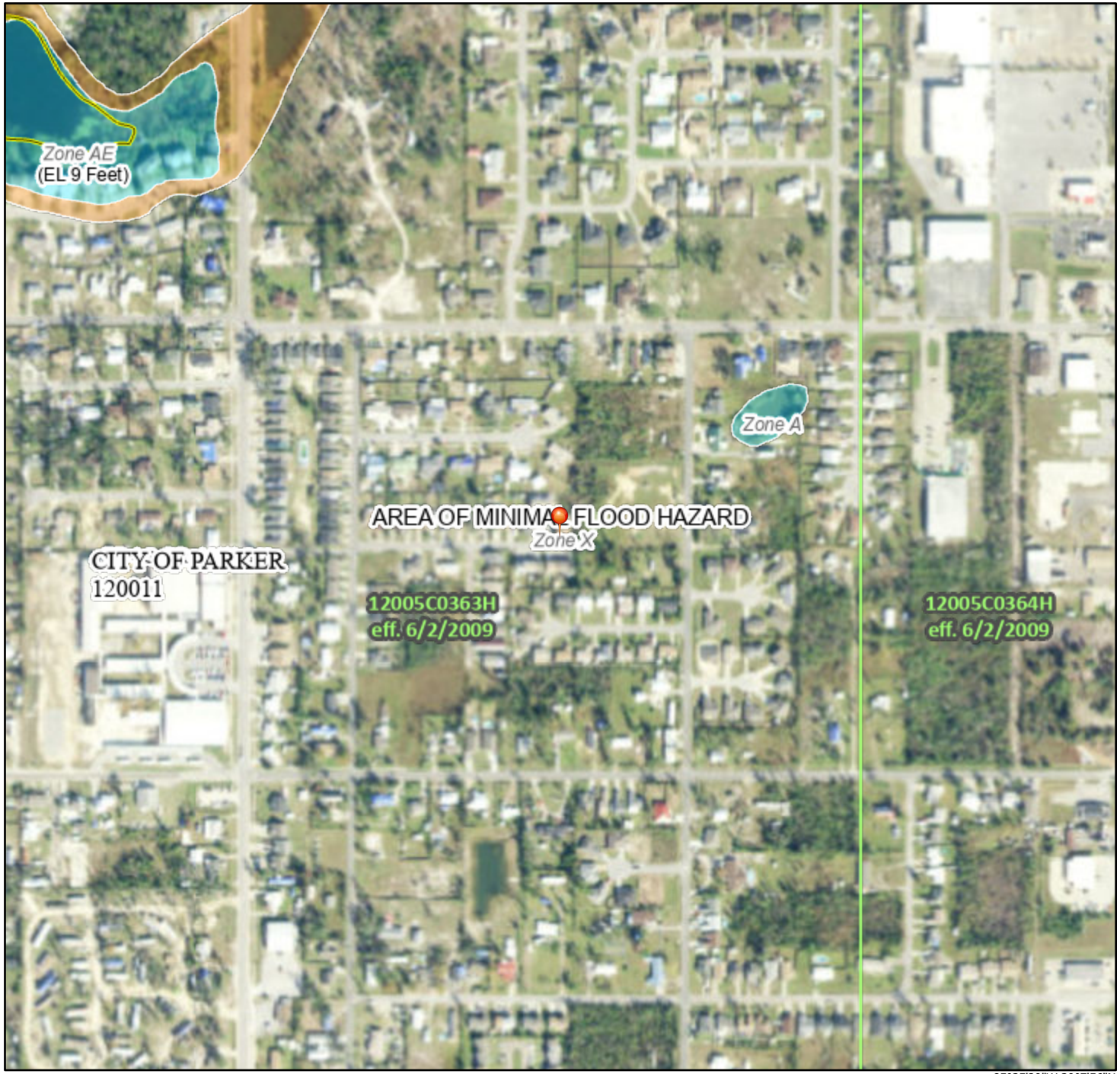
Marla Drive

FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°36'6"W 30°8'27"N



85°35'29"W 30°7'56"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 3:24 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C-2

Lance Street

and

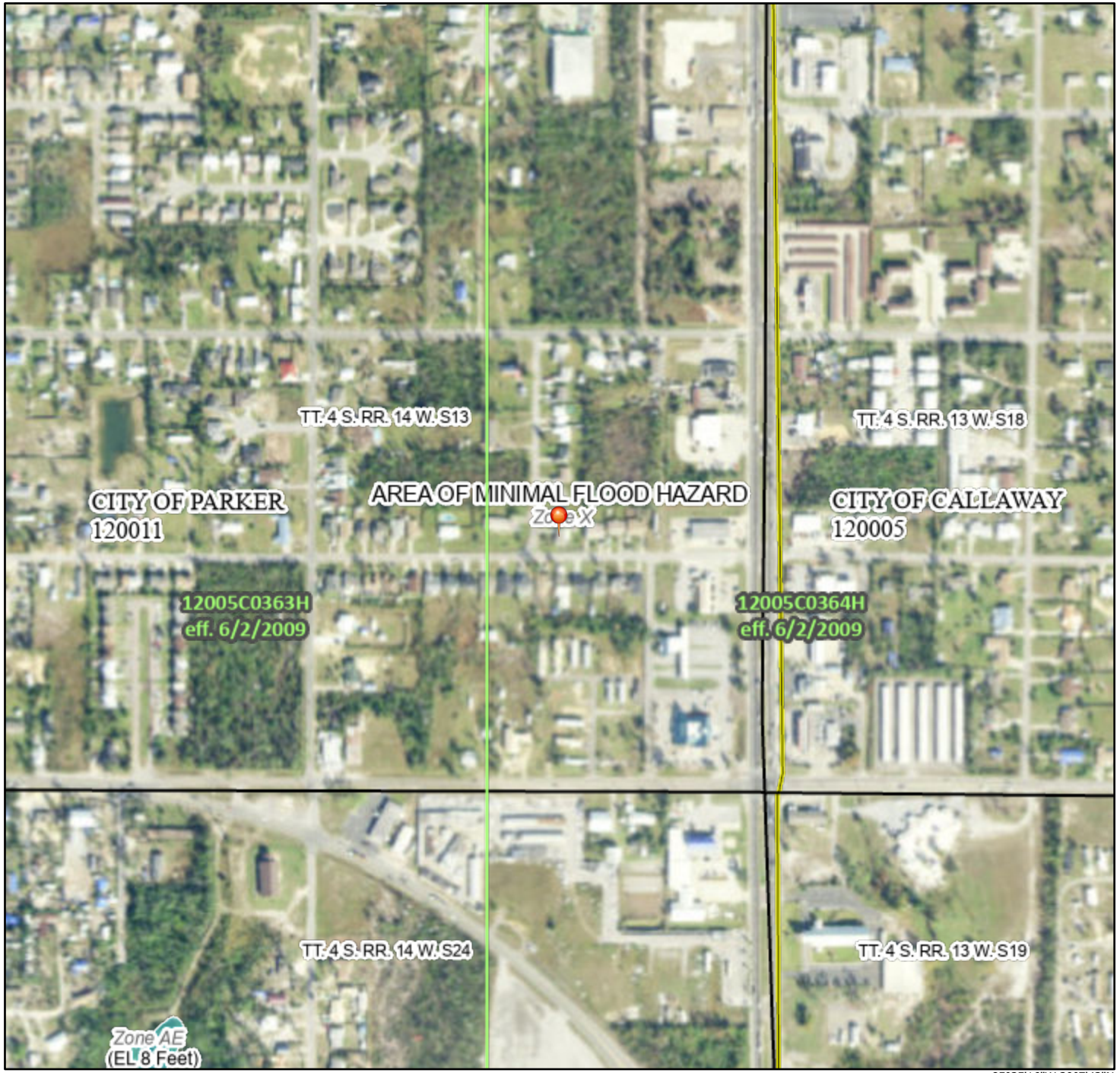
Camelia Avenue

FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°35'54"W 30°8'15"N



85°35'16"W 30°7'43"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 — Cross Sections with 1% Annual Chance
- 17.5 — Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 3:29 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C-3

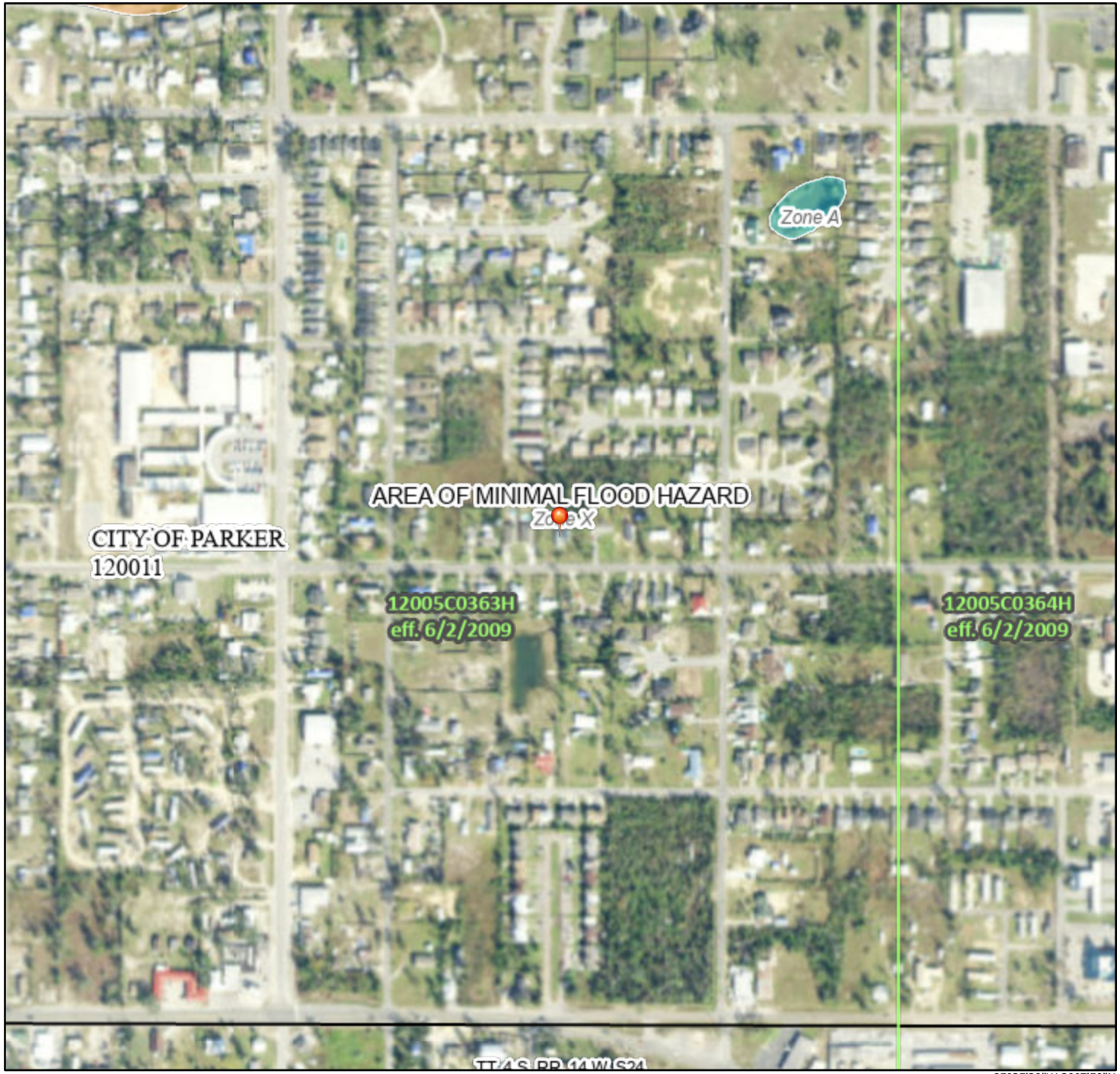
Lake Drive:
Arrow Street to 11th Street

FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°36'8"W 30°8'21"N



85°35'30"W 30°7'50"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 3:32 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C-4

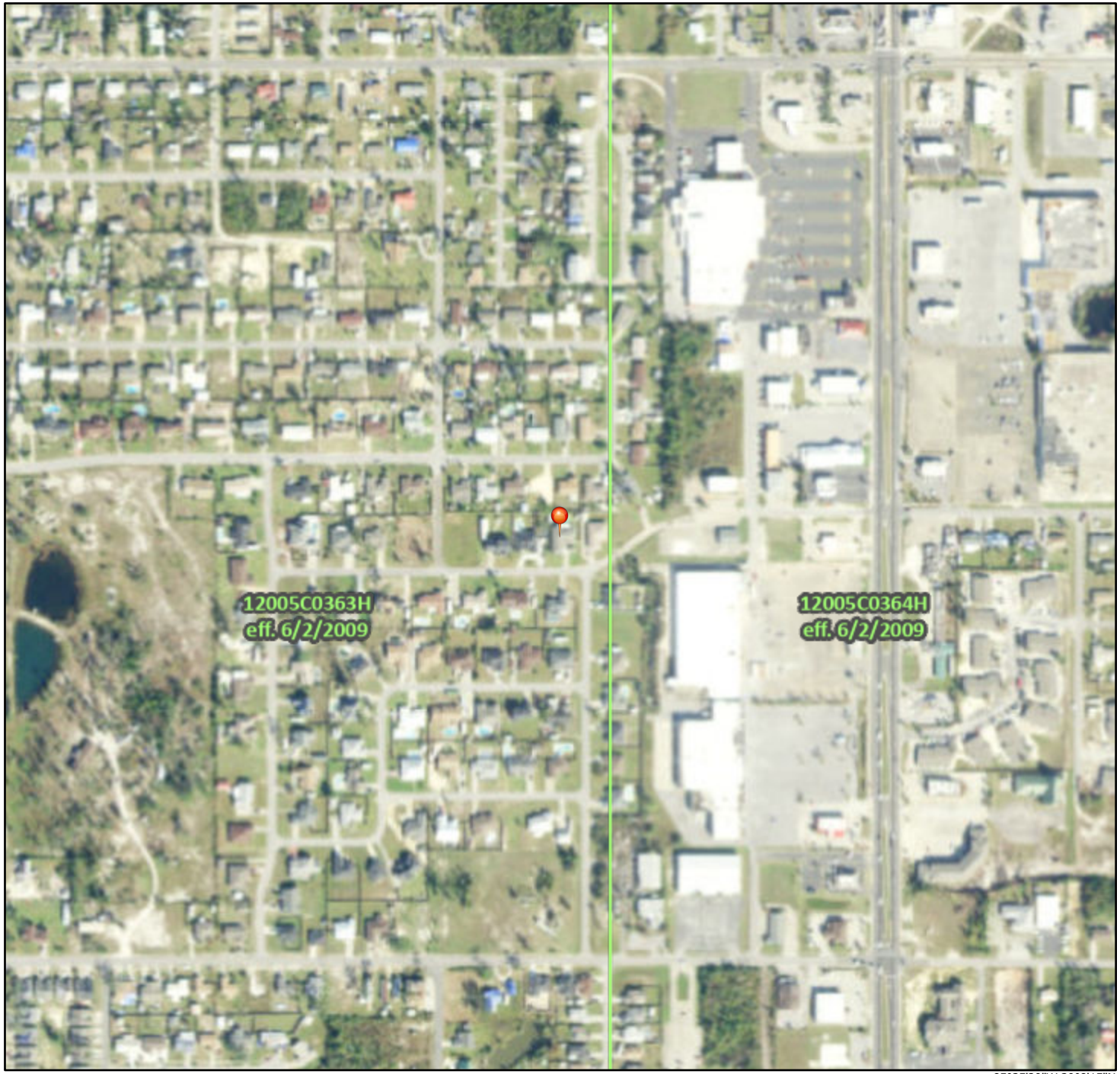
Teri Lane

FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°35'58"W 30°8'46"N



85°35'20"W 30°8'15"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 3:44 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C-5

Indian Summer Avenue

and

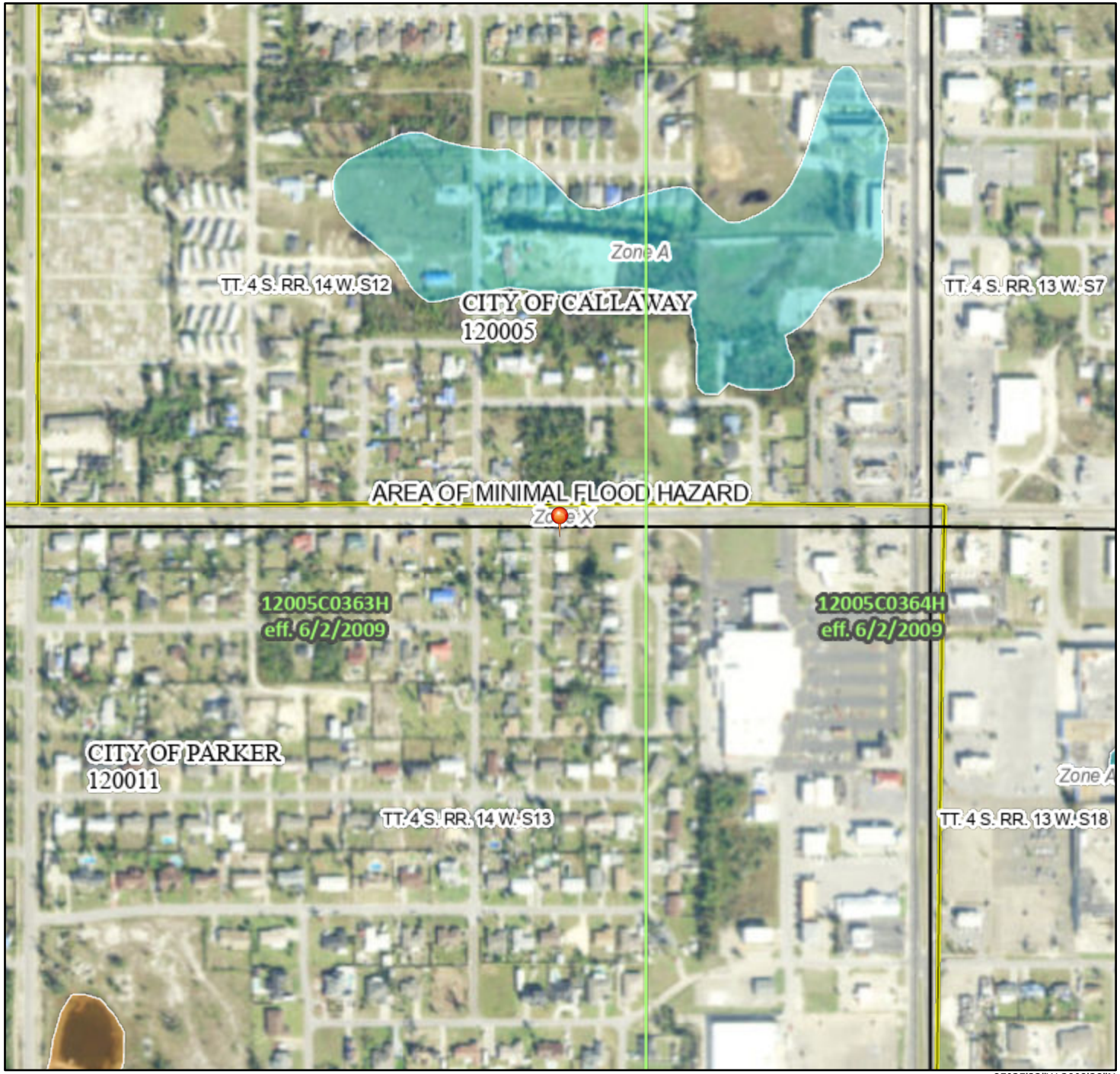
Parker Village Circle

FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°35'59"W 30°8'59"N



85°35'22"W 30°8'28"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 3:47 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C-6

Hickory Street

FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°35'50"W 30°8'33"N



85°35'13"W 30°8'2"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 — Cross Sections with 1% Annual Chance
- 17.5 — Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 3:55 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C-7

Seneca Avenue North

and

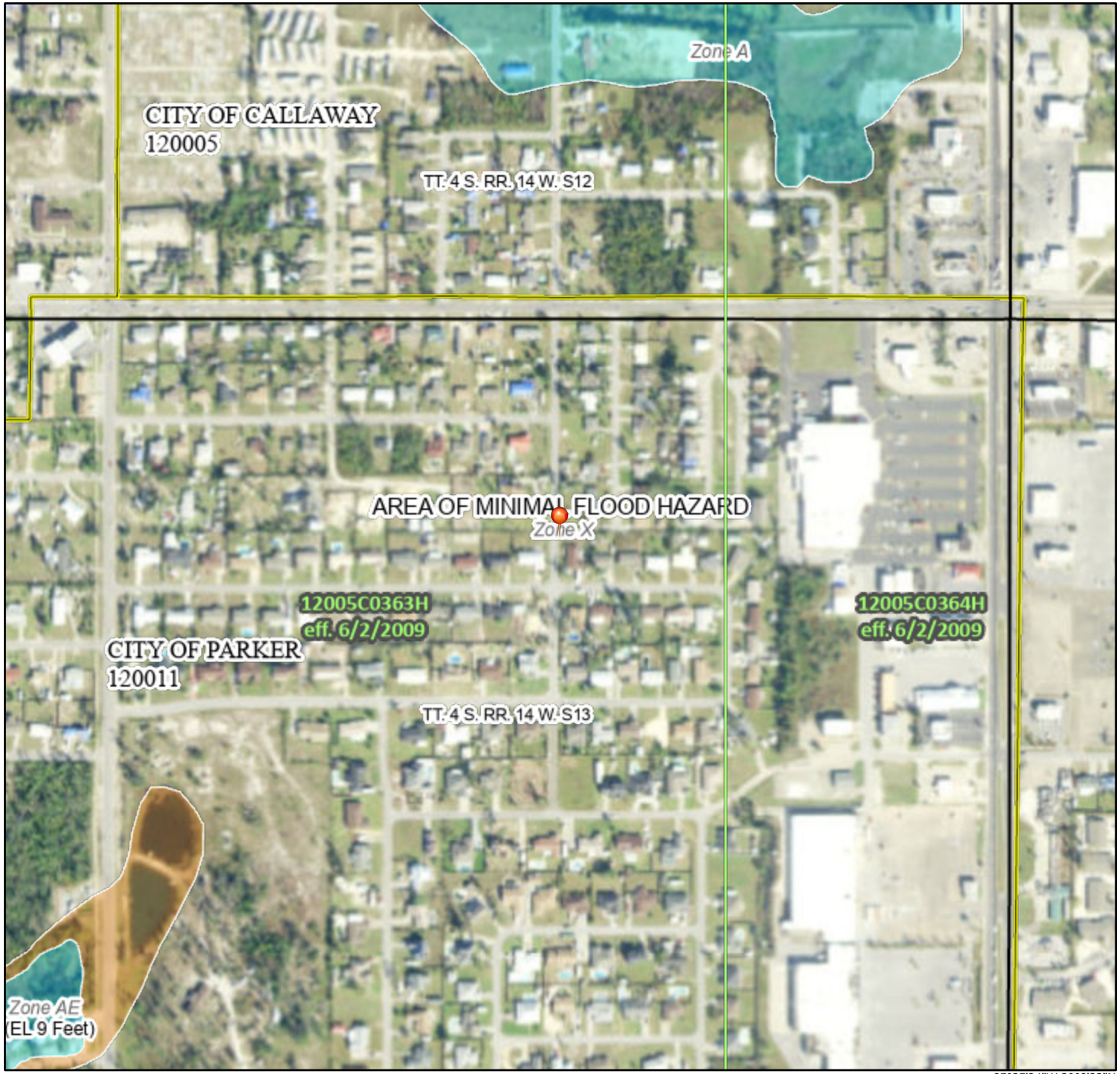
Seneca Avenue South

FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°36'2"W 30°8'53"N



85°35'24"W 30°8'22"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 4:34 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C-8

Lake Drive:

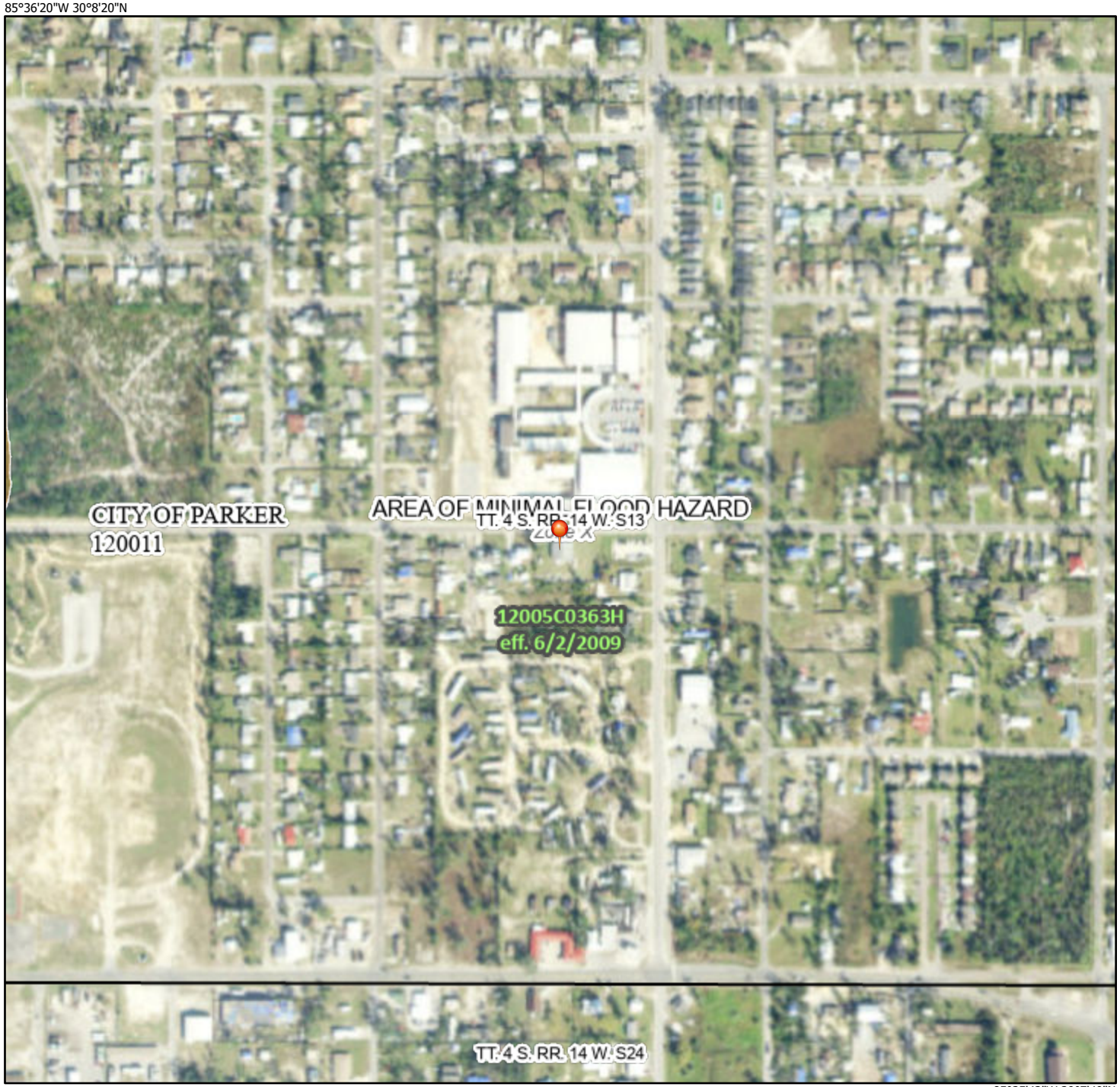
West Park Street to Highway 22A

FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°36'20"W 30°8'20"N



85°35'43"W 30°7'49"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 4:41 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

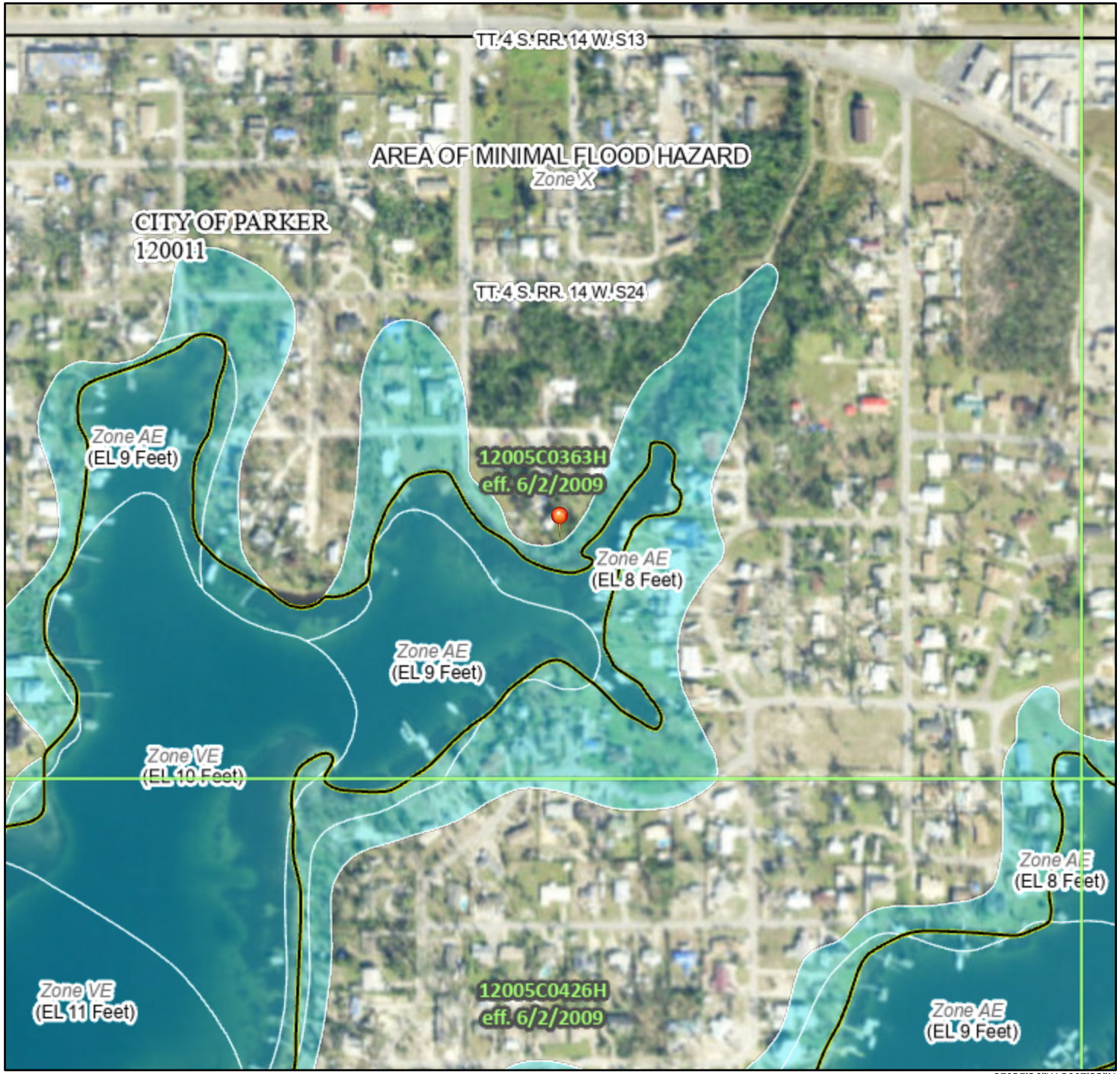
Appendix C-9

East Street and
Moss Street
FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°36'14"W 30°7'53"N



85°35'36"W 30°7'22"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 4:43 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C-10

Thornton Lane

and

Collins Drive

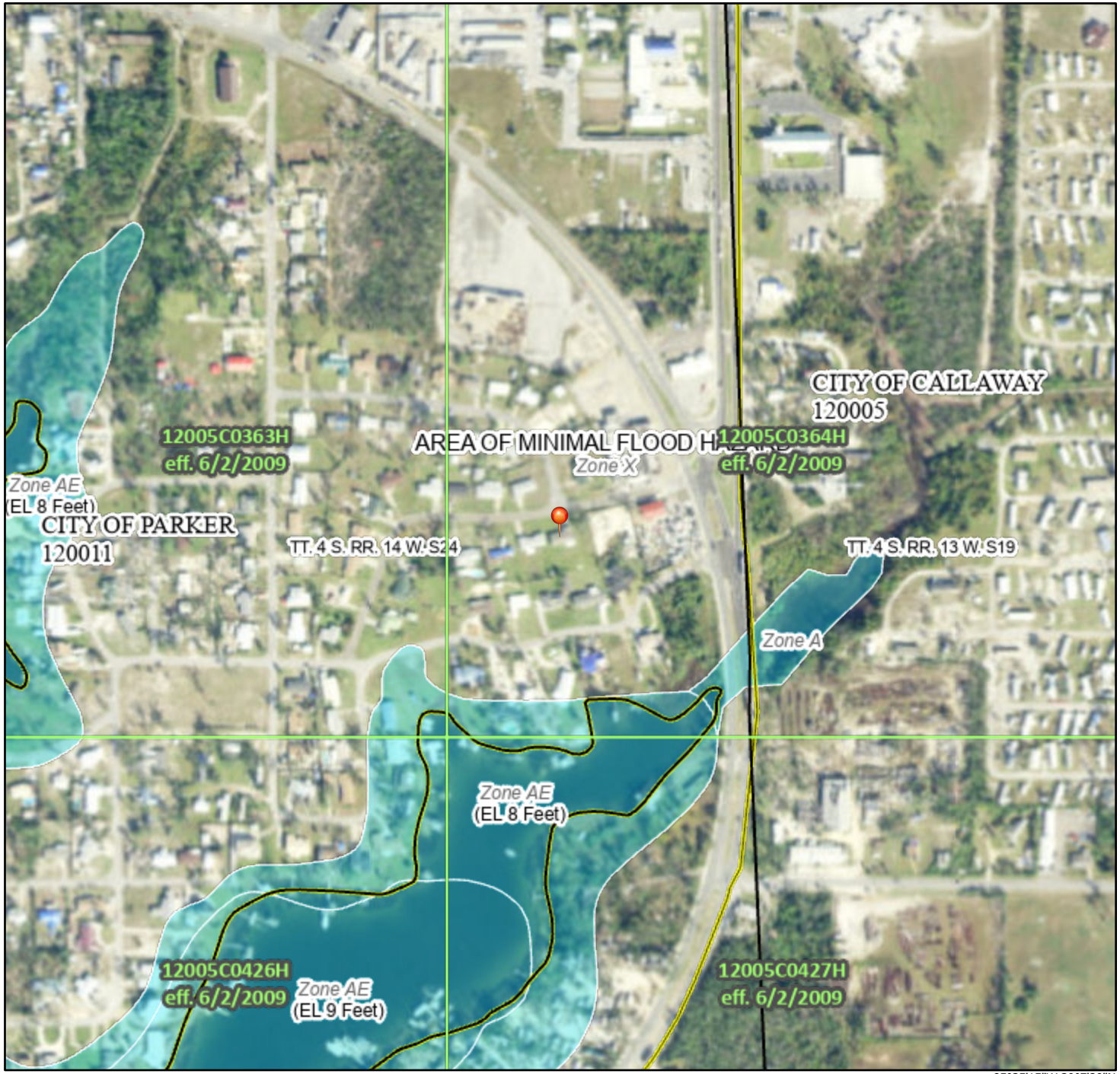
Intersection

FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°35'52"W 30°7'51"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

85°35'15"W 30°7'20"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 4:49 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C-11

Howard Court

FIRMette

National Flood Hazard Layer FIRMette

FEMA

85°35'49"W 30°7'27"N



85°35'12"W 30°6'56"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/1/2023 at 4:46 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix D

Site-Specific Engineer's Opinion of Probable Construction Cost

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
MARLA DRIVE
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	815	CY	$ 15.00	$ 12,225.00
2	Bank Stablization (Concrete)	10,800	SF	$ 10.00	$ 108,000.00
3	Inlet Cleaning [3]	27	LS	$ 500.00	$ 13,500.00
4	Survey/Design [3]	1	LS	$ 12,000.00	$ 12,000.00
5	Clean/Construct Ditch (small)	0	LF	$ 45.00	$ -
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	600	LF	$ 20.00	$ 12,000.00
11	Install New Pipe (18" ADS)	0	LF	$ 100.00	$ -
12	Repair/replace Pipe (24" RCP)	0	LF	$ 120.00	$ -
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 20,000.00	$ 20,000.00
17	Repair/replace Headwall [3]	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	0	LS	$ 3,500.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	0	LS	$ 3,000.00	$ -
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	0	EA	$ 5,000.00	$ -
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 177,725.00**

Notes:

1. **Unit Cost includes Cost + OH, GC, & Profit**
2. **Ditches are assumed to be 6 foot deep**
3. **Lump Sum Costs are based on specific site details**
4. **Lake Drive Estimate provided seperately**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
LANCE STREET AND CAMELLIA AVENUE
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 8,000.00	$ 8,000.00
5	Clean/Construct Ditch (small)	1,640	LF	$ 45.00	$ 73,800.00
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	1,640	LF	$ 20.00	$ 32,800.00
11	Install New Pipe (18" ADS)	0	LF	$ 100.00	$ -
12	Repair/replace Pipe (24" RCP)	60	LF	$ 120.00	$ 7,200.00
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 30,000.00	$ 30,000.00
17	Repair/replace Headwall [3]	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	0	LS	$ 3,500.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	0	LS	$ 3,000.00	$ -
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	0	EA	$ 5,000.00	$ -
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 151,800.00**

Notes:

1 **Unit Cost includes Cost + OH, GC, & Profit**
2 **Ditches are assumed to be 6 foot deep**
3 **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
LAKE DRIVE: ARROW STREET TO 11TH STREET
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 25,000.00	$ 25,000.00
5	Clean/Construct Ditch (small)	0	LF	$ 45.00	$ -
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	1,920	LF	$ 15.00	$ 28,800.00
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	0	LF	$ 20.00	$ -
11	Install New Pipe (18" ADS)	0	LF	$ 100.00	$ -
12	Repair/replace Pipe (24" RCP)	0	LF	$ 120.00	$ -
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 20,000.00	$ 20,000.00
17	Repair/replace Headwall [3]	1	LS	$ 50,000.00	$ 50,000.00
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	1	LS	$ 30,000.00	$ 30,000.00
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	0	LS	$ 3,000.00	$ -
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	0	EA	$ 5,000.00	$ -
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 153,800.00**

Notes:

1 **Unit Cost includes Cost + OH, GC, & Profit**
2 **Ditches are assumed to be 6 foot deep**
3 **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
TERI LANE
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 15,000.00	$ 15,000.00
5	Clean/Construct Ditch (small)	0	LF	$ 45.00	$ -
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond [3]	1	LS	$ 3,500.00	$ 3,500.00
9	Clean Culvert [3]	1	LS	$ 3,500.00	$ 3,500.00
10	Clean Pipes	0	LF	$ 20.00	$ -
11	Install New Pipe (18" ADS)	600	LF	$ 100.00	$ 60,000.00
12	Repair/replace Pipe (24" RCP)	0	LF	$ 120.00	$ -
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 20,000.00	$ 20,000.00
17	Repair/replace Headwall [3]	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	0	LS	$ 10,000.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	0	LS	$ 3,000.00	$ -
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	3	EA	$ 5,000.00	$ 15,000.00
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 117,000.00**

Notes:

1 **Unit Cost includes Cost + OH, GC, & Profit**
2 **Ditches are assumed to be 6 foot deep**
3 **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
INDIAN SUMMER AVENUE AND PARKER VILLAGE CIRCLE
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 25,000.00	$ 25,000.00
5	Clean/Construct Ditch (small)	200	LF	$ 45.00	$ 9,000.00
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	1,750	LF	$ 15.00	$ 26,250.00
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	0	LF	$ 20.00	$ -
11	Install New Pipe (18" ADS)	0	LF	$ 100.00	$ -
12	Repair/replace Pipe (24" RCP)	200	LF	$ 120.00	$ 24,000.00
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 40,000.00	$ 40,000.00
17	Repair/replace Headwall [3]	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	1	LS	$ 30,000.00	$ 30,000.00
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	1	LS	$ 3,000.00	$ 3,000.00
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	8	EA	$ 5,000.00	$ 40,000.00
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 197,250.00**

Notes:

1 **Unit Cost includes Cost + OH, GC, & Profit**
2 **Ditches are assumed to be 6 foot deep**
3 **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
HICKORY STREET
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 20,000.00	$ 20,000.00
5	Clean/Construct Ditch (small)	2,200	LF	$ 45.00	$ 99,000.00
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	0	LF	$ 20.00	$ -
11	Install New Pipe (18" ADS)	0	LF	$ 100.00	$ -
12	Repair/replace Pipe (24" RCP)	0	LF	$ 120.00	$ -
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 15,000.00	$ 15,000.00
17	Repair/replace Headwall [3]	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	0	LS	$ 10,000.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	1	LS	$ 3,000.00	$ 3,000.00
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	5	EA	$ 5,000.00	$ 25,000.00
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 162,000.00**

Notes:

1 **Unit Cost includes Cost + OH, GC, & Profit**
2 **Ditches are assumed to be 6 foot deep**
3 **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
SENECA AVENUE NORTH
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 20,000.00	$ 20,000.00
5	Clean/Construct Ditch (small)	1,600	LF	$ 45.00	$ 72,000.00
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	0	LF	$ 20.00	$ -
11	Install New Pipe (18" ADS)	0	LF	$ 100.00	$ -
12	Repair/replace Pipe (24" RCP)	0	LF	$ 120.00	$ -
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	1,600	LF	$ 120.00	$ 192,000.00
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 20,000.00	$ 20,000.00
17	Repair/replace Headwall [3]	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	0	LS	$ 10,000.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	0	LS	$ 3,000.00	$ -
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	0	EA	$ 5,000.00	$ -
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 304,000.00**

Notes:

1 **Unit Cost includes Cost + OH, GC, & Profit**
2 **Ditches are assumed to be 6 foot deep**
3 **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
SENECA AVENUE SOUTH
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 20,000.00	$ 20,000.00
5	Clean/Construct Ditch (small)	400	LF	$ 45.00	$ 18,000.00
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	0	LF	$ 20.00	$ -
11	Install New Pipe (18" ADS)	0	LF	$ 100.00	$ -
12	Repair/replace Pipe (24" RCP)	0	LF	$ 120.00	$ -
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 30,000.00	$ 30,000.00
17	Repair/replace Headwall [3]	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	0	LS	$ 10,000.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	0	LS	$ 3,000.00	$ -
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	5	EA	$ 5,000.00	$ 25,000.00
28	Clean/Repair Pipe	200	LF	$ 50.00	$ 10,000.00
				Total	**$ 103,000.00**

Notes:

1 **Unit Cost includes Cost + OH, GC, & Profit**
2 **Ditches are assumed to be 6 foot deep**
3 **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
LAKE DRIVE: WEST PARK STREET TO HIGHWAY 22A
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	General Sitework	0	CY	$ 15.00	$ 100,000.00
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning (3)	0	LS	$ 500.00	$ -
4	Survey/Design (3)	1	LS	$ 40,000.00	$ 40,000.00
5	Clean/Construct Ditch (small)	0	LF	$ 45.00	$ -
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond (3)	0	LS	$ 3,500.00	$ -
9	Install New Pipe (12" ADS)	135	LS	$ 90.00	$ 12,150.00
10	Install New Pipe (18" ADS)	365	LF	$ 100.00	$ 36,500.00
11	Install New Pipe (24" ADS)	750	LF	$ 120.00	$ 90,000.00
12	Repair/replace Pipe (30" ADS)	485	LF	$ 140.00	$ 67,900.00
13	Repair/replace Pipe (36" ADS)	40	LF	$ 250.00	$ 10,000.00
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Trench Ddrain	76	LS	$ 40.00	$ 3,040.00
16	Restoration (3)	1	LS	$ 600,000.00	$ 600,000.00
17	Repair/replace Headwall (3)	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond (3)	0	LS	$ 10,000.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes (3)	0	LS	$ 3,000.00	$ -
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	3	EA	$ 3,000.00	$ 9,000.00
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 968,590.00**

Notes:

1. **Unit Cost includes Cost + OH, GC, & Profit**
2. **Ditches are assumed to be 6 foot deep**
3. **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
EAST STREET
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 15,000.00	$ 15,000.00
5	Clean/Construct Ditch (small)	700	LF	$ 45.00	$ 31,500.00
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	0	LF	$ 20.00	$ -
11	Install New Pipe (18" ADS)	0	LF	$ 100.00	$ -
12	Repair/replace Pipe (24" RCP)	600	LF	$ 120.00	$ 72,000.00
13	Repair/replace Pipe (42" RCP)	500	LF	$ 250.00	$ 125,000.00
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 25,000.00	$ 25,000.00
17	Repair/replace Headwall [3]	1	LS	$ 5,000.00	$ 5,000.00
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	0	LS	$ 10,000.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	0	LS	$ 3,000.00	$ -
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	4	EA	$ 5,000.00	$ 20,000.00
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 293,500.00**

Notes:

1 **Unit Cost includes Cost + OH, GC, & Profit**
2 **Ditches are assumed to be 6 foot deep**
3 **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
THORNTON LANE AND COLLINS DRIVE INTERSECTION
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 15,000.00	$ 15,000.00
5	Clean/Construct Ditch (small)	900	LF	$ 45.00	$ 40,500.00
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	0	LF	$ 20.00	$ -
11	Install New Pipe (18" ADS)	0	LF	$ 100.00	$ -
12	Repair/replace Pipe (24" RCP)	0	LF	$ 120.00	$ -
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 15,000.00	$ 15,000.00
17	Repair/replace Headwall [3]	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	0	LS	$ 10,000.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	0	LS	$ 3,000.00	$ -
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	900	LF	$ 60.00	$ 54,000.00
27	Install New Inlet	2	EA	$ 5,000.00	$ 10,000.00
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 134,500.00**

Notes:

1 **Unit Cost includes Cost + OH, GC, & Profit**
2 **Ditches are assumed to be 6 foot deep**
3 **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
MOSS STREET
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 15,000.00	$ 30,000.00
5	Clean/Construct Ditch (small)	0	LF	$ 45.00	$ -
6	Clean/Construct Ditch (large)	1,000	LF	$ 100.00	$ 100,000.00
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	0	LF	$ 20.00	$ -
11	Install New Pipe (18" ADS)	0	LF	$ 100.00	$ -
12	Repair/replace Pipe (24" RCP)	0	LF	$ 120.00	$ -
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	1	LS	$ 30,000.00	$ 30,000.00
16	Restoration [3]	1	LS	$ 80,000.00	$ 80,000.00
17	Repair/replace Headwall [3]	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	0	LS	$ 10,000.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	0	LS	$ 3,000.00	$ -
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	0	EA	$ 5,000.00	$ -
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 240,000.00**

Notes:

1 **Unit Cost includes Cost + OH, GC, & Profit**
2 **Ditches are assumed to be 6 foot deep**
3 **Lump Sum Costs are based on specific site details**

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST
HOWARD COURT
STORMWATER/DRAINAGE IMPROVEMENTS

BID ITEM NO.	DESCRIPTION OF WORK	QUANTITY	UNIT	COST PER UNIT (1)	TOTAL COST PER BID ITEM
1	Ditch Excavation [2]	0	CY	$ 15.00	$ -
2	Bank Stablization (Concrete)	0	SF	$ 10.00	$ -
3	Inlet Cleaning [3]	0	LS	$ 500.00	$ -
4	Survey/Design [3]	1	LS	$ 15,000.00	$ 15,000.00
5	Clean/Construct Ditch (small)	0	LF	$ 45.00	$ -
6	Clean/Construct Ditch (large)	0	LF	$ 100.00	$ -
7	Clean Ditch	0	LF	$ 15.00	$ -
8	Clean Pond [3]	0	LS	$ 3,500.00	$ -
9	Clean Culvert [3]	0	LS	$ 3,500.00	$ -
10	Clean Pipes	0	LF	$ 20.00	$ -
11	Install New Pipe (18" ADS)	850	LF	$ 100.00	$ 85,000.00
12	Repair/replace Pipe (24" RCP)	0	LF	$ 120.00	$ -
13	Repair/replace Pipe (42" RCP)	0	LF	$ 250.00	$ -
14	Remove existing/upsize CMP to 18"	0	LF	$ 120.00	$ -
15	Install 60" Pipe	0	LS	$ 30,000.00	$ -
16	Restoration [3]	1	LS	$ 15,000.00	$ 30,000.00
17	Repair/replace Headwall [3]	0	LS	$ 5,000.00	$ -
18	Ditch Stablization/Clean	0	LF	$ 4.00	$ -
19	Pipe and/or Swale Cleaning	0	LF	$ 2.00	$ -
20	Repair Outflow Pipe	0	LF	$ 40.00	$ -
21	Regrade Pond [3]	0	LS	$ 10,000.00	$ -
22	Ditch Cleaning/Enlarge	0	LF	$ 75.00	$ -
23	Camera Pipes [3]	1	LS	$ 6,000.00	$ 6,000.00
24	Regrade Ditches	0	LF	$ 40.00	$ -
25	Install Drainage Ditch/Cross Drains	0	LF	$ 200.00	$ -
26	Install Curb/Gutter System	0	LF	$ 60.00	$ -
27	Install New Inlet	4	EA	$ 5,000.00	$ 20,000.00
28	Clean/Repair Pipe	0	LF	$ 50.00	$ -
				Total	**$ 156,000.00**

Notes:

1. **Unit Cost includes Cost + OH, GC, & Profit**
2. **Ditches are assumed to be 6 foot deep**
3. **Lump Sum Costs are based on specific site details**