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June 24, 2024

Sent via email: [Virginia.Barker@brevardfl.gov](mailto:Virginia.Barker@brevardfl.gov)

Ms. Virginia Barker, Director  
Brevard County Natural Resources Management Department  
2725 Judge Fran Jamieson Way, Building A  
Viera, Florida 32940

Re: Public Interest Determination: Widening Project within Pelican Creek  
1865 through 1935 S. Banana River Drive, Merritt Island, Florida 32952  
Tax Parcel IDs: 2524354, 2524350, 2535314, 30222327, & 2524353  
Clients/Applicants: Aaron Reninger and Roger Xavier

Dear Ms. Barker,

Please accept this letter as a request for a Public Interest Determination (PID) for the above referenced Project. The proposed Project will provide environmental, social and economic benefits to the local community and public at large as defined in Brevard County Code Section 62-3661. The Project seeks to dredge and expand the existing drainage canal most commonly known as Pelican Creek. The canal is located at the southern end of the S. Banana River Drive, south of State Road 520 on Merritt Island. The Project location has the northern boundary beginning at Old Causeway Road running south 900 feet (900'), where Pelican Creek connects to the Banana River Aquatic Preserve. See aerial map enclosed as Exhibit "A".

The Project site serves as the primary drainage feature for the peninsula south of State Road 528 down to Horti Point, and between Newfound Harbor Drive and S. Banana River Drive. The canal takes the runoff from the upstream drainage basin southward to ultimately discharge into the Banana River. Due to increased flooding, Brevard County engaged Hanson Professional Services, Inc. ("Hanson") to conduct a drainage study, present findings and make recommendations for necessary drainage improvements. A Technical Memorandum (Project No.: 18Lo216To3) was issued on March 16, 2021, by Hanson incorporating the County's express directives. See Technical Memorandum enclosed as Exhibit "B".

1290 U.S. Highway 1 | Suite 103 | Rockledge, FL 32955  
Office: 321.608.0892 | Fax: 321.608.0891

To prepare the necessary documents to submit for permitting for the Project, Bennett Engineering & Consulting has been hired to provide an engineering analysis of the existing conditions of the canal, analyze and evaluate the County's solicited study by Hanson, and provide a professional opinion on the requested Project's goal to dredge the canal to expand the width and depth. The assessment by Clayton Bennett, P.E., of Bennett Engineering & Consulting is enclosed as Exhibit "C". Toland Environmental Consulting (TEC) has also been hired to conduct an analysis of the environmental impacts and consequences of expanding the existing drainage canal; that analysis is enclosed as Exhibit "D".

To achieve the many public benefits of this Project outlined below, pursuant to Code Section 62-3666 (6, 9, and 12) the Applicants are seeking a permissible exception that allows for the widening and/or deepening of an existing canal. This is not a "new navigation canal" as Mr. Renninger has utilized this canal over the last seven (7) year with a variety of motor boats and kayaks. This Project is in the best public interest. Section 62-3661 defines best public interest to mean a project which clearly demonstrates a net benefit to the public, as determined by the Board of County Commissioners, and adequately mitigates adverse environmental impacts.

Below you will find information regarding the Project details, the foreseeable impacts, and an outline of the Project's positive public benefits.

#### Environmental Benefits:

- Improved Water Quality:
  - Adequate dredging would remove accumulated muck and organic materials that have built up over time in the canal, which would help facilitate improved water quality.
  - The Project will yield decreased nutrient loading and dissolved oxygen levels within the canal and adjacent waters of the Banana River.
  - The potential for improved water quality as a result of this Project is consistent with the first Goal of the Indian River Lagoon (IRL) Comprehensive Conservation and Management Plan, which aims to attain and maintain sufficient quality water and sediment to support a healthy estuarine lagoon ecosystem.
  - Further, the County's Fresh and Storm Water Discharge Action Plan states in FSD-6 that the County should "reduce the impacts of muck on the Indian River



Lagoon”. The Project’s results would generate this public benefit consistent with the County’s IRL goals and objectives.

- Wetlands:
  - Increased flushing that leads to improved water quality will likely afford the capability to help restore lost wetland function and restore pre-existing mangrove fringe.
  - The environmental benefits the public stands to gain from the possible restoration of wetland functionality is consistent with Objective 5 in the County’s Comprehensive Plan, which aims to preserve, protect, restore and replace wetlands to achieve a no net loss of function.
  - Further, if any activity related to the Project degrades or destroys an existing functional wetland, then the Applicants intend to repair and mitigate such loss as is required by Section 62-3695 of the County’s Code.
  
- Manatee Protection:
  - The Brevard County Manatee Protection Plan approved by the Brevard County Board of Commissioners in January 2003 states it is recommended that access channels be dredged and maintained for the purpose of navigation and manatee mobility, unless it is proven to be detrimental to the public interest. (See Section II “Recommendations”, Subsection J “Maintenance Dredging Projects”, Pages 31-32)
  - Further, the Manatee Protection Plan outlines the basic habitat for manatees should include a steady and easily obtainable food supply (primarily seagrass), quiet, sheltered areas for resting, breeding and calving, warm waters and the possibility of fresh drinking water. (See Section III “Inventory and Analysis”, Subsection A(7) “The Florida Manatee – Habitat Requirements”, Page 54)
  - Manatees are known to frequent the residential canal basin south of the proposed Project site just adjacent from the Banana River. Due to built up siltation and depth limitations within the Project area, manatees have been precluded from accessing the protected inshore waters of the canal.

- The proposed Project's actions and subsequent benefits as outlined above and in the attached reports will result in a public benefit by way of contributing to the County's desired goal of allowing for and creating hospitable habitats for manatees.
- Seagrass Production and Restoration:
  - The lack of productive seagrass beds in the Banana River has created an environmental challenge for our County. The last productive year for seagrasses in the Project site area was 2009. The improvements to the canal that intend to be accomplished, including but not limited to the removal of underwater blockages, will afford seagrass beds the opportunity to rehabilitate and thrive.
  - The benefit of improved seagrass and other aquatic vegetation is consistent with the County's stated Water Quality/Seagrass Objective 2, Chapter X "Coastal Management Element" of the Comprehensive Plan as well as the objective set forth in the Seagrass Protection, Restoration and Management Action Plan.
  - As a subsequent benefit, with improved water quality, increased flow, and increased flushing, the additional seagrass beds will create a more conducive environment for shellfish harvesting. This resulting benefit would support Objective 3 "Fisheries" as stated in Chapter X "Coastal Management" of the County's Comprehensive Plan. Therefore, dredging would be permissible under Section 62-3668(9)(b) as it would serve the public interest by improving water quality by removing silt and improving circulation in the Projects outlined waterway.

#### Social Benefits:

- The Project would assist in reducing standing flood waters covering surface areas during and after storm events, thus in turn providing relief to local landowners, public roadways, public right of ways, and historic uplands.
- The Project will allow boat traffic in the canal, as has historically occurred.

#### Economic Benefits:

- Dredging of the canal south of Old Causeway Road would help alleviate the existing strain on the Pelican Creek drainage system by lowering the tailwater conditions for the existing culverts under Old Causeway Road, which would in turn provide added



longevity to the existing culverts if the proposed culvert replacement improvements were to be delayed or abandoned.

- Enlarging the cross-sectional area of the canal will allow for increased waterflow rates, which would accommodate Hanson's recommended Pelican Creek culvert upgrades with little to no impacts on surrounding landowners.
- By removing the underwater blockages that currently exist complimented by accessible shoreline habitats, this will allow for increased usage of fisheries and aquatic nurseries.

In conclusion, the proposed dredging Project clearly demonstrates a wide range of anticipated public benefits reaching from environmental, economic and social of which will all contribute to the mitigation of adverse environmental impacts. The dredging of the existing canal overall will allow for a higher functioning drainage canal, benefitting not only the residents within the neighboring area, but the public at large while accomplishing environmentally sound results.

The Applicants will work with all necessary federal, state, and local agencies to ensure environmental and land use regulations will be adhered to and all necessary permits obtained.

We are requesting this item be scheduled for consideration by the Board of County Commissioners at the soonest opportunity. Should you need any further information or have any questions or concerns, please feel free to contact me at (321) 608-0892 or by email.

Sincerely,

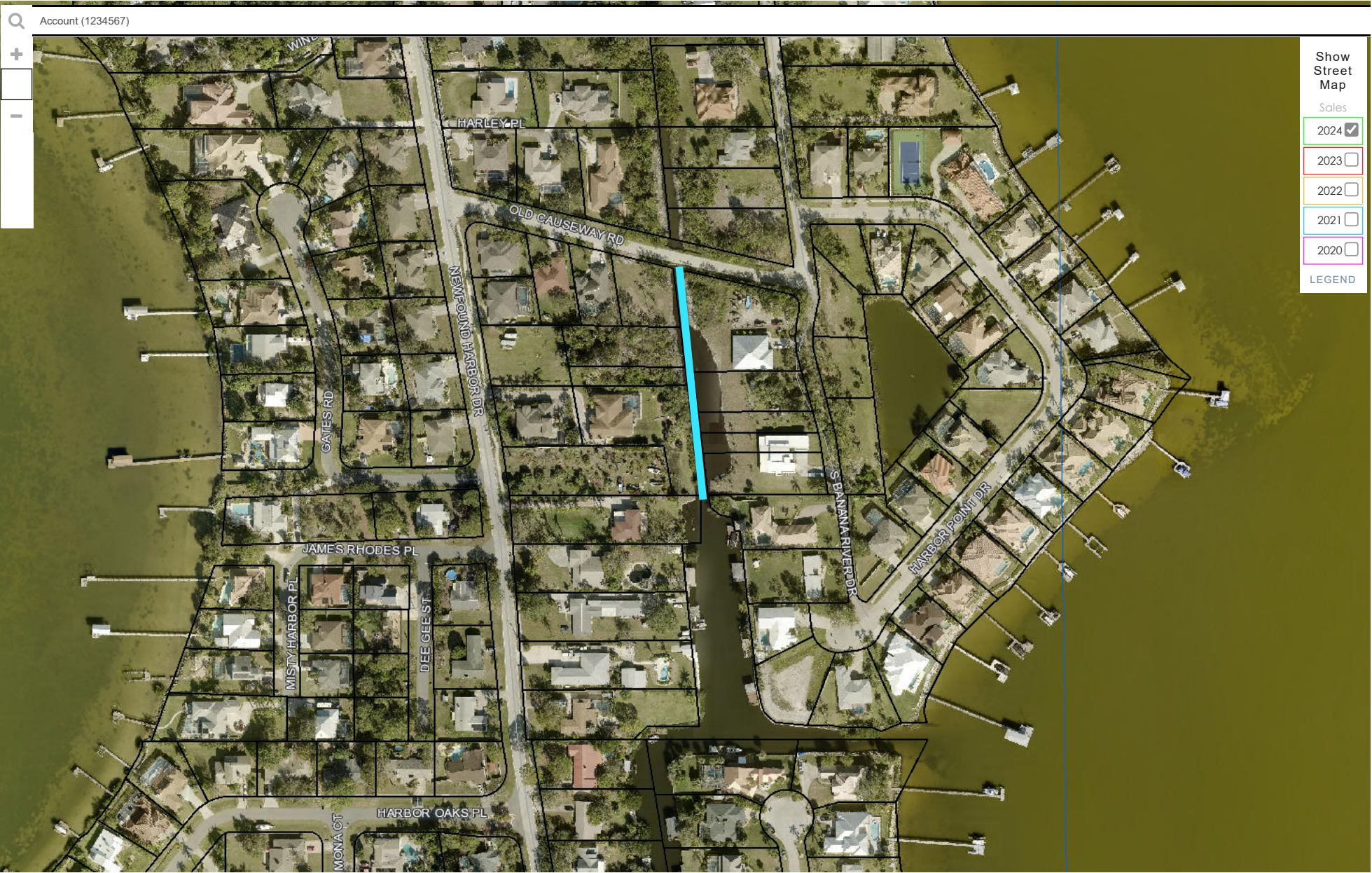


Kimberly Bonder Rezanka

KBR/cal  
enclosures

cc: Morris Richardson, County Attorney (via email)  
Frank Abbate, County Manager (via email)  
Tad Calkins, Growth Management Director (via email)  
Darcie McGee, Natural Resources Management (via email)  
Clayton Bennett, P.E. (via email)  
Lisa Toland (via email)  
Clients (via email)





NO DATA FOUND



## TECHNICAL MEMORANDUM

Project: Newfound Harbor Drainage Study

Date: 3/16/2021

Subject: Draft Study Results/Recommendations

Project No.: 18L0216T03

### Study Scope

The purpose of this technical memorandum is to summarize the analysis and recommendations to improve drainage conditions within the study area of Newfound Harbor Drive (NFHD), located in Merritt Island, Florida. Drainage improvement concepts are based on strategies involving introducing/enhancing pipe collection systems to improve surface drainage. The analysis includes stormwater modeling to assess culvert capacity and staging performance for Pelican Creek, which serves as a primary outfall for this region of the island.

### Data Collection

Hanson has been provided or acquired the following data for use in this study:

1. Angel City Stormwater Quality Masterplan produced by Stormwater Solutions, Inc. dated 09/2012
2. GIS data for the existing stormwater and utility infrastructure
3. Survey data of the existing stormwater infrastructure
4. 2007 LiDAR DEM provided by NOAA Digital Coast download
5. Google Earth Historic Aerial Photographic Documentation
6. NOAA weather data

### Study Area

Refer to the figure on the right and Appendix A for a depiction of the project area and basin boundaries for this drainage study. The study area boundary was based off field visits, coordination with the County, and resident complaints.



## Existing Conditions

Stormwater runoff in the study area generally drains toward Pelican Creek. The creek flows south through several culverts under the crossing roadways. Pelican Creek discharges into the Banana River at the Banana River Marina and Horti Point. LiDAR data along NFHD indicates that it generally drains to a low segment between Angel Avenue and Fowler Drive. NFHD is a flush shoulder roadway with little to no roadside ditch storage. The road does not have a dedicated collection system, but drainage inlets associated with side street collection systems accept flow from NFHD. In general, the study area has few existing drainage systems, with most of the existing systems in newer subdivisions adjacent to the study area. The exceptions are systems along Angel Avenue and Fowler Drive, each of which cover a small segment of NFHD.



Given the area's low elevations, Hanson reviewed the available tide data and found that several of these areas could be impacted regularly due to the creek's normal tide elevations. To illustrate this, the figure at left shows the trouble spots circled in yellow and areas inundated by the mean high tide elevation of 0.75-foot NAVD. Also shown for comparison is the FEMA 100-year base flood elevations, which range from 3 to 4 feet NAVD.

For reference, tide elevations for two large storm events were collected from the NOAA tide station at Port Canaveral (the closest active station). Those events and peak water levels were:

- 10/7/2016 - 5:48AM  
Peak Tide = 2.84' NAVD  
Total Rainfall 5.2" over 6 days
- 9/11/2017 - 3:18AM  
Peak Tide = 5.24' NAVD  
Total Rainfall 12" over 4 days

The tide station is in a location that would see a greater amount of hurricane storm surge than the study area due to its proximity to the coast and lack of any barrier island protection. Therefore, the peak tide elevations at the station are likely 2 to 3 feet higher than those seen at the Angel City peninsula.

These storm event dates were compared to available aerial imagery to identify areas of poor drainage and flooding to support the proposed improvements. Design and analysis of the systems was done for much lower intensity events (mean annual, 10-year, and 25-year-24-hour) and using the mean high-water elevation at the outfall locations.

**During tidal events higher than MHW, many areas likely will experience flooding regardless of any drainage**

**improvements being implemented. Improvements proposed in this study will provide quicker drainage of the flooded area as the tide recedes and resolve trapped/standing water problems caused solely by poor drainage.**



## Proposed Improvement Alternatives

Drainage improvement concepts were developed for the road and creek segments that comprise the study area. A summary of the concepts developed are provided for each segment.

### Pelican Creek Segment

#### Description of Problem

→ Pelican Creek is the main conveyance for stormwater runoff between NFHD and Banana River Drive beginning at Merritt Island Causeway to Horti Point. Pelican Creek has two discharge locations into the Banana River – the Banana River Marina and Horti Point. Pelican Creek has been assumed, for modeling purposes, to flow north to south. Culvert configuration (sizes and inverts) along Pelican Creek is sporadic and does not reflect a consistent slope north or south. See **Appendix B** for sizes and locations of each existing culvert along Pelican Creek within the study area. Many culverts are suspected to be undersized, failing, or otherwise not functioning properly, causing overtopping of roads and high-water conditions upstream.

#### Proposed Improvements

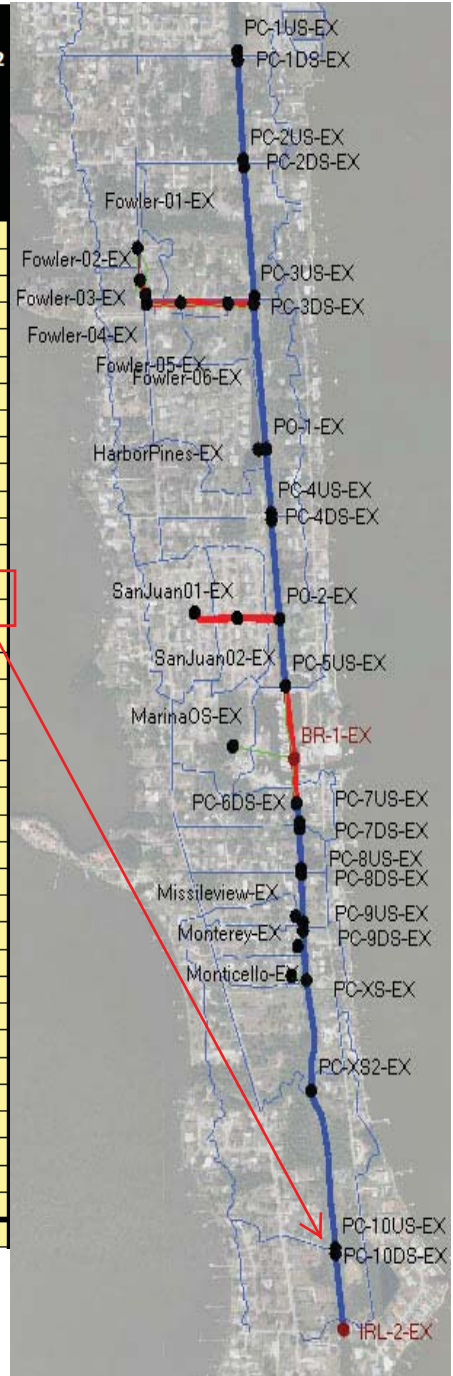
→ Because Pelican Creek is the primary connection to tide for the study area, it is the most critical piece of the proposed improvements. Hanson developed an ICPR4 stormwater model of Pelican Creek Between Worley Avenue and Old Causeway Road to investigate the benefits of upsizing the eleven existing cross drains within the segment. Based on the analysis, the proposed concept includes upsizing of all eleven cross drains to triple barrel 36-inch culverts. This will provide immediate benefits to adjacent areas and collection systems that discharge directly into the creek. These improvements can be divided into two phases: improvements to Pelican Creek north of the Banana River Lagoon Outfall and improvements to Pelican Creek south of the Banana River Lagoon Outfall. **Old Causeway Road part of Phase 2**

→ The total proposed culvert replacement improvements provide an average 0.42-foot reduction in the peak stage for the 25-year, 24-hour SJRWMD design storm along the creek. Peak stage reductions provided by the Phase 1 Pelican Creek improvements average 0.27-foot, while the Phase 2 improvements' reductions average 0.19-foot. Hanson also investigated the added benefit of dredging the canal segments and found that dredging provided only an average additional 0.02-foot stage reduction compared with only upsizing the culverts. Dredging would likely result in additional permitting/wetland impacts as well, so it is not recommended as a drainage improvement to reduce flooding. A node link diagram and summary table representing the creek stage reductions associated with the culvert replacements and creek bed dredging are included on the following page.

**Appendix B** provides a more detailed plan view of the proposed improvements. Construction and engineering for are estimated to cost \$751,610 for the Phase 1 improvements and \$822,370 for the Phase 2 improvements. The Phase 1 Pelican Creek improvements provide a greater reduction in peak flood stages along the creek at a lower estimated cost so is recommended at a higher priority than the Phase 2 improvements. **Appendix C** provides an opinion of probable cost in 2021 dollars for these conceptual improvements based on FDOT Statewide Historical Cost data.

## ICPR Stormwater Analysis Summary

Node Name	Storm Event	Pelican Creek Phase 1 Max Stage (ft)	Pelican Creek Phase 2 Max Stage (ft)	Only Proposed Culverts Max Stage (ft)	Proposed Culverts & Dredging Max Stage (ft)	Existing Max Stage (ft)	Culverts & Dredging vs Only Proposed Culverts Stage Change (ft)	Phase 1 vs Existing Stage Change	Phase 2 vs Existing Stage Change	Phases 1 & 2 vs Existing Stage Change (ft)
BR-1-EX	WMD25y24h	0.75	0.75	0.75	0.75	0.75	0.00	0.00	0.00	0.00
Fowler-01-EX	WMD25y24h	2.72	2.72	2.72	2.72	2.72	0.00	0.00	0.00	0.00
Fowler-02-EX	WMD25y24h	2.72	2.72	2.72	2.72	2.72	0.00	0.00	0.00	0.00
Fowler-03-EX	WMD25y24h	2.72	2.72	2.72	2.72	2.72	0.00	0.00	0.00	0.00
Fowler-04-EX	WMD25y24h	2.71	2.72	2.71	2.71	2.72	0.00	-0.01	0.00	-0.01
Fowler-05-EX	WMD25y24h	2.70	2.70	2.70	2.70	2.70	0.00	0.00	0.00	0.00
Fowler-06-EX	WMD25y24h	2.58	2.58	2.58	2.58	2.58	0.00	0.00	0.00	0.00
HarborPines-EX	WMD25y24h	1.92	2.55	1.92	1.93	2.56	0.01	-0.64	-0.01	-0.64
IRL-2-EX	WMD25y24h	0.75	0.75	0.75	0.75	0.75	0.00	0.00	0.00	0.00
MarinaOS-EX	WMD25y24h	2.12	2.12	2.12	2.12	2.12	0.00	0.00	0.00	0.00
Missileview-EX	WMD25y24h	1.52	1.24	1.22	1.17	1.56	-0.05	-0.04	-0.32	-0.34
Monterey-EX	WMD25y24h	1.52	1.24	1.23	1.17	1.57	-0.06	-0.05	-0.33	-0.34
Monticello-EX	WMD25y24h	1.52	1.24	1.23	1.17	1.57	-0.06	-0.05	-0.33	-0.34
PC-10DS-EX	WMD25y24h	0.78	0.88	0.83	0.83	0.80	0.00	-0.02	0.08	0.03
PC-10US-EX	WMD25y24h	1.52	1.22	1.20	1.16	1.57	-0.04	-0.05	-0.35	-0.37
PC-1DS-EX	WMD25y24h	2.45	2.75	2.45	2.44	2.75	-0.01	-0.30	0.00	-0.30
PC-1US-EX	WMD25y24h	2.52	2.75	2.52	2.52	2.75	0.00	-0.23	0.00	-0.23
PC-2DS-EX	WMD25y24h	2.39	2.73	2.39	2.37	2.74	-0.02	-0.35	-0.01	-0.35
PC-2US-EX	WMD25y24h	2.44	2.74	2.44	2.43	2.75	-0.01	-0.31	-0.01	-0.31
PC-3DS-EX	WMD25y24h	1.85	2.56	1.86	1.85	2.57	-0.01	-0.72	-0.01	-0.71
PC-3US-EX	WMD25y24h	2.37	2.72	2.38	2.37	2.73	-0.01	-0.36	-0.01	-0.35
PC-4DS-EX	WMD25y24h	1.77	2.54	1.78	1.81	2.54	0.03	-0.77	0.00	-0.76
PC-4US-EX	WMD25y24h	1.81	2.54	1.82	1.84	2.55	0.02	-0.74	-0.01	-0.73
PC-5US-EX	WMD25y24h	1.75	2.53	1.75	1.80	2.54	0.05	-0.79	-0.01	-0.79
PC-6DS-EX	WMD25y24h	1.35	0.94	0.94	0.94	1.48	0.00	-0.13	-0.54	-0.54
PC-7DS-EX	WMD25y24h	1.44	1.22	1.21	1.15	1.54	-0.06	-0.10	-0.32	-0.33
PC-7US-EX	WMD25y24h	1.35	0.94	0.94	0.94	1.48	0.00	-0.13	-0.54	-0.54
PC-8DS-EX	WMD25y24h	1.52	1.23	1.22	1.16	1.56	-0.06	-0.04	-0.33	-0.34
PC-8US-EX	WMD25y24h	1.44	1.22	1.21	1.15	1.54	-0.06	-0.10	-0.32	-0.33
PC-9DS-EX	WMD25y24h	1.52	1.23	1.22	1.16	1.57	-0.06	-0.05	-0.34	-0.35
PC-9US-EX	WMD25y24h	1.52	1.23	1.22	1.16	1.56	-0.06	-0.04	-0.33	-0.34
PC-XS-EX	WMD25y24h	1.52	1.24	1.22	1.16	1.57	-0.06	-0.05	-0.33	-0.35
PC-XS2-EX	WMD25y24h	1.52	1.24	1.22	1.16	1.57	-0.06	-0.05	-0.33	-0.35
PO-1-EX	WMD25y24h	1.82	2.55	1.83	1.85	2.56	0.02	-0.74	-0.01	-0.73
PO-2-EX	WMD25y24h	1.76	2.53	1.76	1.81	2.54	0.05	-0.78	-0.01	-0.78
SanJuan01-EX	WMD25y24h	4.85	4.87	4.85	4.85	4.87	0.00	-0.02	0.00	-0.02
SanJuan02-EX	WMD25y24h	4.39	4.48	4.39	4.40	4.48	0.01	-0.09	0.00	-0.09
Average along Pelican Creek							-0.02	-0.27	-0.19	-0.42





## Permitting

The proposed concepts are anticipated to qualify for either a permit exemption or general permit with SJRWMD as long as wetland impacts are not too high. Wetland impacts were not estimated for the concept alternatives. Early coordination with SJRWMD and DEP to confirm permitting requirements for any concept alternatives being advanced to final design.

## Summary

Pelican Creek conveyance improvements will lower peak stages throughout the creek which will provide systemic improve reduction for drainage systems that discharge to the creek. The Angel Avenue and Fowler Drive improvements will add needed inlets to the lowest segment of NFHD within the study area. Based on the severity of the existing flooding impacts to residences as well as other factors such as costs and benefits, the projects were prioritized as follows:

Priority	Drainage System	Estimated Cost	Anticipated Benefit
1	Pelican Creek (Phase 1)	\$751,610	High
2	Fowler Drive and NFHD	\$474,769	High
3	Pelican Creek (Phase 2)	\$822,370	High
4	Angel Avenue (Phase 1)	\$363,101	Medium
5	Angel Avenue (Phase 2)	\$225,243	High
6	Piney Woods Circle	\$136,851	Medium
7	Orris Avenue	\$174,451	Medium
8	Mili Avenue	\$240,118	Low

Topographic survey and control maps or boundary survey are recommended for selected alternatives that the concepts and cost estimates can be refined. GIS parcel lines from the property appraiser's website were reviewed and considered during concept development. Boundary survey would allow confirmation of R/W impacts or easement needs related to the concepts. Based on boundary information, the concepts may be able to be modified to avoid/minimize R/W & easement requirements.

## Attachments

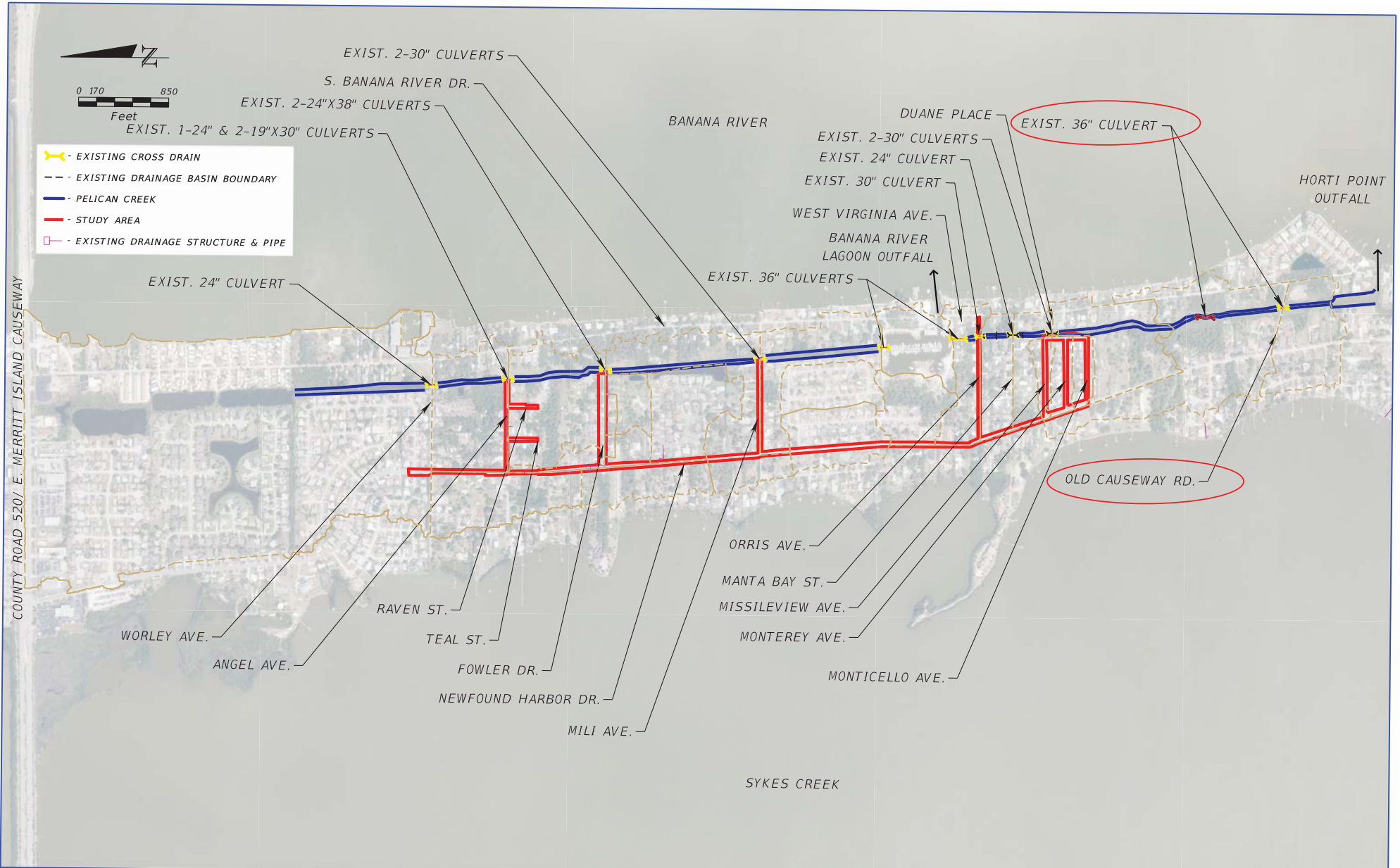
Appendix A: Study Project Area Overview

Appendix B: Concept Layouts

Appendix C: Engineer's Cost Estimates

APPENDIX A:  
STUDY PROJECT AREA OVERVIEW



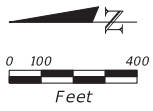


HANSON PROFESSIONAL SERVICES INC.

NEWFOUND HARBOR DRIVE  
DRAINAGE CONCEPT STUDY

STUDY PROJECT AREA  
OVERVIEW

APPENDIX B:  
CONCEPT EXHIBITS



- PROPOSED CROSS DRAIN
- EXISTING DRAINAGE STRUCTURES & PIPES
- PAVEMENT IMPACTS

BANANA RIVER

REPLACE EXISTING CULVERT(S)  
WITH 3-36" CULVERTS

REPLACE EXISTING CULVERT(S)  
& DBI WITH 3-36" CULVERTS & DBI

REPLACE EXISTING CULVERT(S)  
WITH 3-36" CULVERTS

HORTI POINT  
OUTFALL

BANANA RIVER  
LAGOON OUTFALL

S. BANANA RIVER DR.



OLD CAUSEWAY RD.

NEWFOUND HARBOR DR.

SYKES CREEK

DUANE PLACE

MONTICELLO AVE.

MONTEREY AVE.

MISSILEVIEW AVE.

MANTA BAY ST.

ORRIS AVE.

WEST VIRGINIA AVE.

RANDALL AVE.

HANSON PROFESSIONAL SERVICES INC.

NEWFOUND HARBOR DRIVE  
DRAINAGE CONCEPT STUDY

PELICAN CREEK  
(PHASE 2)



APPENDIX C:  
ENGINEER'S COST ESTIMATE

**Engineer's Cost Estimate  
Brevard County Public Works  
Newfound Harbor Drainage Study  
System: Pelican Creek (Phase 2)**

ITEM NO.	ITEM DESCRIPTION	QTY	UNIT	UNIT COST FDOT 12 MO AREA 8	UNIT COST FDOT 6 MO STATEWIDE	UNIT COST FDOT 12 MO STATEWIDE	UNIT COST	TOTAL COST
104-10-3	SEDIMENT BARRIER	1,400	LF	\$1.86	\$1.74	\$1.80	\$1.86	\$2,604.00
104-11	FLOATING TURBIDITY BARRIER	800	LF	\$6.34	\$10.57	\$10.08	\$10.57	\$8,456.00
110-1-1	CLEARING & GRUBBING	0.5	AC	\$27,852.42	\$16,410.92	\$18,529.72	\$27,852.42	\$13,926.21
160-4	TYPE B STABILIZATION	1500	SY	\$6.77	\$5.37	\$5.11	\$6.77	\$10,155.00
285-706	OPTIONAL BASE, BASE GROUP 06	1500	SY	\$15.56	\$15.90	\$15.77	\$15.90	\$23,850.00
334-1-11	SUPERPAVE ASPHALTIC CONC, TRAFFIC A	130	TN	\$105.38	\$114.61	\$115.16	\$115.16	\$14,970.80
430-175-136	PIPE CULVERT, OPT MATERIAL, ROUND, 36"S/CD	850	LF	\$199.46	\$215.16	\$181.82	\$215.16	\$182,886.00
430-536-300	STRAIGHT CONCRETE ENDWALLS, 36", TRIPLE, 0 DEGREES, ROUND	10	EA	\$16,701.99	\$11,529.99	\$17,307.39	\$17,307.39	\$173,073.90
425-1-521	INLETS, DT BOT, TYPE C, <10'	1	EA	\$4,378.26	\$4,203.58	\$4,178.36	\$4,378.26	\$4,378.26
570-1-2	PERFORMANCE TURF, SOD	600	SY	\$3.02	\$3.29	\$2.84	\$3.29	\$1,974.00
<b>SUBTOTAL FOR BASE BID ITEMS</b>								\$436,270
101-1	MOBILIZATION (15%)	1	LS				\$65,440.50	\$65,440
102-1	MAINTENANCE OF TRAFFIC (10%)	1	LS				\$43,627.00	\$43,630
	CONTINGENCY (20%)	1	LS				\$87,254.00	\$87,250
<b>SUBTOTAL FOR CONSTRUCTION COSTS</b>								\$632,590
	ENGINEERING AND CEI (30%)	1	LS				\$189,777.00	\$189,780
<b>TOTAL FOR BASE BID ITEMS</b>								\$822,370

Note: Cost for existing utilities relocation not included.

Note: Brevard County Official Land Development Exhibits 1 and 3 used for paving details.

Note: Mobilization and maintenance of traffic is estimated to be higher due to the multiple site locations for these improvements.



April 9, 2024

Ms. Kimberly B. Rezanka  
6013 Farcenda, PL, Suite 101  
Melbourne, FL 32940

**Re: 1865 & 1935 S. Banana River Drive, Merritt Island  
Engineering Assessment  
BEC No. 23.420**

Dear Ms. Rezanka:

The following is a preliminary summary of the Bennett Engineering & Consulting, LLC analysis of the dredging of the existing drainage canal south of Old Causeway Road. The said drainage canal is known as Pelican Creek.

Pelican Creek serves as a primary drainage feature for most of the peninsula south of SR 528 to Horti Point, and between Newfound Harbor Drive and South Banana River Drive. The area has experienced flooding and Brevard County retained Hanson to perform a drainage study and make appropriate drainage improvement recommendations. Hanson issued a Technical Memorandum (project no. 18L0216T03) dated March 16, 2021, summarizing the findings and recommendations of the study. A copy of the said technical memorandum is provided as Exhibit "A".

In the technical memorandum, Hanson acknowledged that resident complaints were one consideration in establishing the project study area boundaries. Furthermore, Hanson noted that *"Because Pelican Creek is the primary connection to tide for the study area, it is the most critical piece of the proposed improvements."*

The study found that the existing peak stage for Pelican Creek between Duane Place and Old Causeway Road for the 25-year/24-hour storm event to be 1.57-feet. The stormwater runoff from the said area of Pelican Creek then drains both north and south to discharge to tidal waters. By upgrading all the culverts within Pelican Creek to triple 36" diameter pipes, the peak stage within Pelican Creek between Duane Place and Old Causeway Road will be lowered from 1.57-feet down to approximately 1.2-feet, a reduction of almost 4.5-inches. A 4.5-inch reduction in the flood stage over very flat lands can have a significant reduction in the surface area covered by flood waters during a storm event, thus providing a benefit to many landowners as well as the public with lower flood waters within the public rights-of-way.

A concern with following the recommendation of Hanson to simply upgrade all the Pelican Creek culverts with triple 36-inch pipes is that the increased conveyance



capacity of the new culverts could negatively affect downstream properties. For instance, the Pelican Creek peak stages at the south side of Old Causeway Road increases from 0.80-feet to 0.88-feet, if only the Phase 2 improvements are constructed. The said increase flood stage occurs because the flow rate within Pelican Creek south of Old Causeway Road has increased, which requires a steeper hydraulic gradient within Pelican Creek to handle the increase flow. Thus, under the said circumstances, while the landowners north of Old Causeway Road will benefit from the upgraded culverts, the landowners south of Old Causeway Road will be negatively impacted.

A means to mitigate the negative impacts to the landowners south of Old Causeway Road is to improve the conveyance system from Old Causeway Road south to tidal waters by dredging the existing canal. The dredging of the canal would both enlarge the canal cross-sectional area as well as reduce the roughness coefficient of the canal, thereby allowing the canal to convey the increased flow rates utilizing a hydraulic gradient equal to or less than the existing condition, thereby accommodating the proposed Pelican Creek culvert upgrades without negatively impacting landowners. Even if Brevard County does not move forward with implementing the culvert improvements proposed by Hanson, the dredging of the canal south of Old Causeway Road would still be a benefit to the Pelican Creek drainage system by lowering the tailwater conditions for the existing culvert under Old Causeway Road.

Not only would dredging the canal to an adequate width and depth address the negative impacts associated with the increased predicted flood stages determined by Hanson but would also remove the accumulation of muck and organic materials that have built up in the canal over time and which is a source of poor water quality.

In 1991, SJRWMD issued a permit number 12-009-0056S for the excavation of 10,800 cubic yards of material and placement of 2,400 cubic yards of fill material in waters of the state for the expansion of an existing residential canal, maintenance dredging of the entrance channel and the realignment of a roadway associated with the construction of the Harbor Point Subdivision. A copy of the said SJRWMD is enclosed as Exhibit "B".

The approved SJRWMD project included design elements such as rear lot water quality swales to collect and treat stormwater runoff from abutting residential lot before discharging into the canal, and a littoral shelf with wetland plantings that ran along the shoreline of the expanded residential canal. The said design elements could be incorporated into the proposed project to help bring the project into compliance with regulatory agencies.

Should you have any questions or need additional information, please contact me directly.

**Bennett Engineering & Consulting, LLC.**

Digitally signed by Clayton A Bennett  
Date: 2024.04.09 14:31:37 -04'00'

**Clayton A. Bennett, P.E.**  
**Managing Member**



April 11, 2024

Kimberly Rezanka, Partner  
Lacey, Lyons & Rezanka  
6013 Farcenda Place  
Suite 101  
Melbourne, FL 32940

RE: Analysis of the Net Environmental Benefit  
Widening Project within Pelican Creek  
1865 through 1935 S. Banana River Drive  
Merritt Island, Florida 32952  
Tax ID: 2524354, 2524350, 2535314, 3022327 & 2524353

Dear Ms. Rezanka:

The following is a summary of Toland Environmental Consulting's (TEC) analysis of the environmental consequences of expanding an existing drainage canal, known locally as Pelican Creek, which is connected to the Banana River Aquatic Preserve.

The project site is located at the southern end of South Banana River Drive, south of State Road 520 on Merritt Island, where, at the project location, a 900-foot section of a Pelican Creek connects to the Banana River Aquatic Preserve (Figure 1). The northern limit of this section of the Creek is Old Causeway Road (Figure 1). Pelican Creek serves as the primary drainage feature for the Newfound Harbor peninsula taking runoff from the upstream drainage basin and discharging it into the Banana River. A review of aerial imagery at the intersection of Old Causeway Road and the Creek reveals that the Creek was created prior to 1943 in what appears to have been upland Pine Flatwoods and Dry prairie habitats (Figures 2 & 3).

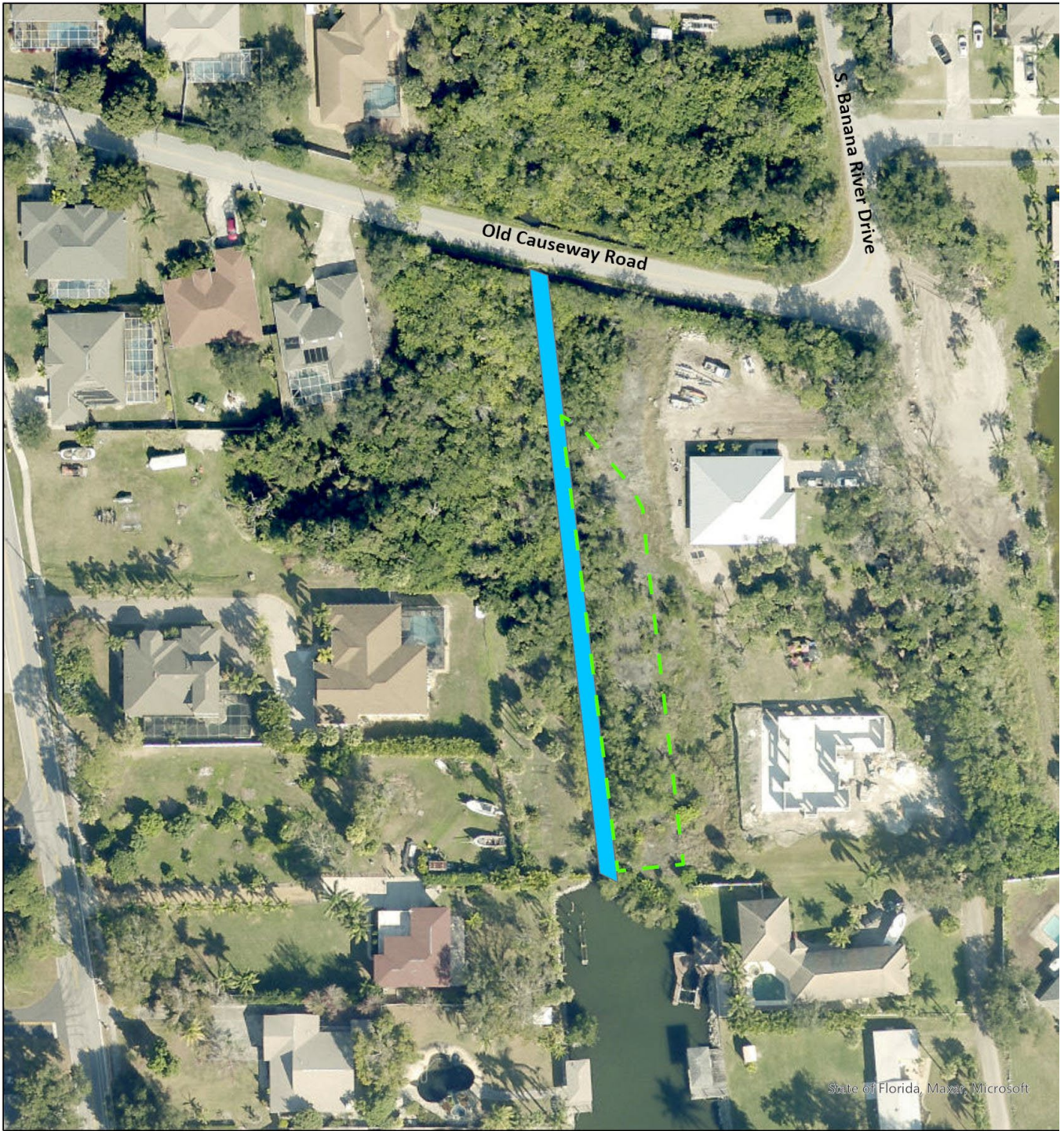
A review of historical permitting records maintained by the St. Johns River Water Management District (SJRWMD) (ERP # 33131-2, Legacy # 12-009-0056AS) indicates that in 1991, Pelican Creek was approximately twenty-five feet wide and two to three feet deep. Aerial imagery taken between January and February 2024 for the Brevard County Property Appraiser's Office indicates that the width of the canal remains approximately twenty-five feet.

Over time, fringing wetland communities were established on the historical upland shorelines adjacent to the Creek through the natural recruitment of a mixture of mangroves, native salt marsh vegetation, and exotic Brazilian pepper trees. Wetlands were created through the elevation of the groundwater table by the standing stormwater runoff in the undersized regional drainage feature and through the overflow of the undersized Creek onto adjacent uplands during large storm events (Photograph 1).





Figure 1: Regional Location Map



-  Property
-  CLC 4420 Ditch/Artificial Stream (FLUCCS 740 Disturbed Uplands)
-  Approximate Limits of Canal Expansion

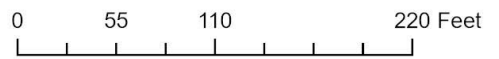


Figure prepared by TEC using 2021 FDOT Aerial Imagery



Figure 2: 1943 UF Aerial Image of Site



Figure 3: 1951 UF Aerial Image of Site



At peak stages, the Newfound Harbor area experiences significant flooding over large areas due to the relatively flat terrain in the area with floodwaters overflowing into public rights-of-way and historic upland areas (Photograph 2). Flooding is exacerbated at the project location as the project area is the southernmost point of the unaltered Creek that runs north/south through the Newfound Harbor peninsula before it discharges into a previously widened residential Class III canal directly connecting to the Banana River (Photograph 1). Hence, the project area receives significant volumes of upstream stormwater runoff while being limited to discharge this flow into the wider residential canal due to sedimentation and other factors. A full discussion of flooding issues within this section of Pelican Creek is presented in an engineering analysis prepared by Bennett Engineering dated April 9, 2024. This bottleneck to stormwater flow makes the project area more susceptible to flooding during storm events, and more susceptible to expansion of shoreline wetlands over time as stormwater volumes increase with increasing development. The impact of the cumulative effects of this bottleneck is readily seen in photograph one, where flood elevations stage just beyond the width of the widened residential canal to the south (Photograph 1).



Photograph 2:  
Localized Flooding

Based upon SJRWMD's project review files and data produced by the Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute, manatees are known to frequent the residential canal basin immediately south of the project site and the adjacent waters of the Banana River. However, depth limitations within this section of the project area caused by siltation preclude manatees from using these protected inshore waters adjacent to the project site. A stated goal of the Brevard County Manatee Protection plan is to improve water quality within canals to provide additional quiet habitat-sheltered from wind and weather so that manatees can calve and rest.

Tidal effects in this part of the lagoon system are negligible, and water levels vary primarily in response to wind-induced water level changes and stormwater input from the upstream drainage basin. Sediment accumulation further limits water exchange between the project site and Banana River. The absence of tidal influence and flow restrictions precludes periodic flushing of the existing drainage canal basin. Poor flushing results in poor water quality within the drainage canal and adjacent waters of the Banana River through increased nutrient loading and decreased dissolved oxygen (D.O.) levels. Localized fishkills following summer storm events were noted in the project review files of the SJRWMD (ERP # 33131-2).

Poor water quality is evidenced by fishkills, the lack of productive seagrass beds in this reach of the Banana River, and a reduction in productive shellfish harvesting. TEC reviewed seagrass maps prepared by the SJRWMD from 2007 to the present. 2009 was the last productive year for seagrasses in this reach of the Banana River when seagrass coverage was patchy along the shoreline and increased to continuous in offshore areas (Figure 4). 2009 was also the last year that the Shellfish Environmental Assessment Section of the Division of Aquaculture within the Florida Department of Agriculture & Consumer Services updated the environmental evaluation for this section of the Banana River and classified the area for shellfish harvesting (Figure 5). The waters at the intersection of the drainage canal/residential canal to the waters of the Banana River and immediately south were classified in 2009 as conditionally restricted and prohibited, respectively (Figure 5). To ensure consumer safety, conditionally restricted shellfish harvesting areas have background pollution levels that require temporary closures following further pollutant loading after storm events or may require additional purification of the harvested shellfish in clean water before consumers' sale or ingestion. Prohibited shellfish harvesting areas have background pollution levels that forbid the sale or indigestion of shellfish harvested from the area, even with purification, as product safety cannot be ensured (Figure 6). Following a series of super blooms of harmful algae, by 2013, all seagrasses were gone (Figure 7). Although other reaches of the lagoon have shown improvements in seagrass coverage, this area of the Banana River has failed to recover as of the 2021 seagrass survey (Figure 8).



Figure 4: SJRWMD 2009 Seagrass Coverage Map



Seagrass\_2009



0 345 690 1,380 Feet

Figure prepared by TEC using 2021 FDOT Aerial Imagery

Figure 5: Florida Division of Aquaculture Shellfish Harvesting Map

SHELLFISH HARVESTING CLASSIFICATION AREA MAP #79 (Effective: December 28, 2009)

South Banana River (#79) Shellfish Harvesting Area in Brevard County [Current status of this area](#)

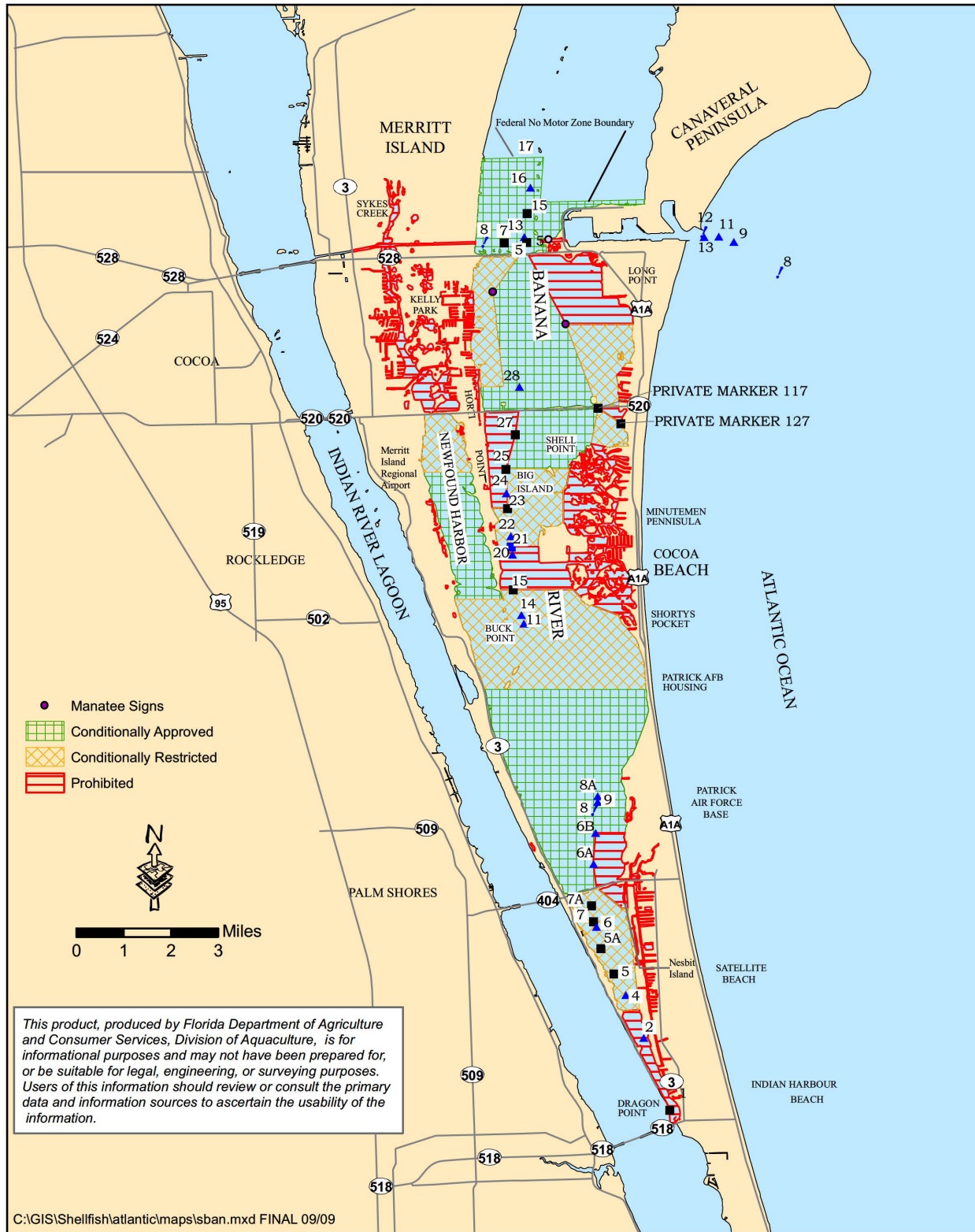




Figure 6: SJRWMD 2013 Seagrass Coverage Map



 Seagrass\_2013



0 345 690 1,380 Feet

Figure prepared by TEC using 2021 FDOT Aerial Imagery



Figure 7: SJRWMD 2021 Seagrass Coverage Map



 Seagrass\_2021



0 345 690 1,380 Feet

Figure prepared by TEC using 2021 FDOT Aerial Imagery

Overall, before any alterations, the upland-cut drainage canal at the project site provided minimal value to aquatic species, fisheries, and aquatic environments due to poor water exchange and water quality. Pelican Creek's primary ecological value is in the man-made fringe wetlands created through the channelization of regional stormwater runoff.

Improvements to local water quality through increased basin turnover, along with the ability to restore wetland functions previously created by manmade activities, were the basis for the SJRWMD and the ACOE to issue permits to expand 900-feet of Pelican Creek within the project area to align with the existing width and depth of the existing residential canal immediately to the south (1991 ERP #333131-2). Similarly, the applicant believes that removing existing siltation, increasing the water depth, increasing the creek width, aligning Pelican Creek with the residential canal, replacing any lost wetland function, and replacing the pre-existing mangrove fringe will increase wind-driven turnover, increase DO, decrease nutrient loading, decrease local flooding during large storm events, increase usage by fisheries by removing underwater blockages and providing accessible shoreline habitat for aquatic nursery and fisheries functions, and increasing usage by manatees by providing protected calving, nursing and loafing areas.

The applicant will obtain all necessary approvals from federal, state, and local agencies to ensure that all environmental and land use regulations are followed. These permits will require the applicant to demonstrate that the above-mentioned water quality improvement will occur post-development and that whatever wetland function is lost during construction will be replaced with similar wetland function within the same watershed basin.

Given the poor water quality in the area, evidenced by the lack of seagrasses and productive shellfish harvesting areas, the expansion of the drainage ditch, as originally permitted to match the existing residential canal to the south, will provide a net environmental benefit to the local area.

If you have any questions or require additional information about this environmental analysis, please call my office at 321-242-7173 or e-mail me [teclisa@cfl.rr.com](mailto:teclisa@cfl.rr.com)

Sincerely,

*Lisa J. Toland*

Lisa Toland, President