Suncoast Parkway 2

Final Pond Siting Report

For:

Suncoast Parkway 2

From S.R. 44 to C.R. 486

Financial Project ID: 442764-1-52-01

Citrus County (84700)

GEC Project Manager: Francisco Cardona, P.E., P.T.O.E.
WBQ Project Manager: Troy Vargas, P.E.

October 2020

Prepared by:
WBQ Design & Engineering, Inc.
201 N. Magnolia Avenue, Suite 200
Orlando, FL 32801
Vendor No. 59-320700400

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POND SITING REPORT

Suncoast Parkway 2

SR 589 from SR 44 to CR 486

Citrus County (02470)

Financial Project ID: 442764-1-52-01

Prepared for:

Florida's Turnpike Enterprise

I hereby certify that this Pond Siting Report has been properly prepared by me, or under my responsible charge, in accordance with procedures adopted by the Florida Department of Transportation.

Haley M. Thomas, P.E., State of Florida, Professional Engineer, License Number 83310.
This item has been digitally signed and sealed by Haley M. Thomas, P.E. on the date indicated here. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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Florida's Turnpike Enterprise Concurrence
Erin Yao, P.E.
Turnpike District Drainage Engineer

Haley M. Thomas, P.E.
License No: 83310
WBQ Design & Engineering, Inc.
201 N. Magnolia Avenue, Suite 200
Orlando, FL 32801
Vendor No.: F593207004-001

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EXECUTIVE SUMMARY

WBQ Design & Engineering, Inc. has been contracted to provide drainage design for the Florida's Turnpike Enterprise (FTE) Phase 2 extension of SR 589 (Suncoast Parkway). Phase 2 of Suncoast Parkway 2 extends from south of SR 44 (West Gulf to Lake Highway) to CR 486 (West Norvell Bryant Highway) in Citrus County, Florida. The project limits are from Sta. 4252+25.64 to Sta. 4385+00.00, a total length of approximately 2.7 miles. The limits of Phase 2 of Suncoast Parkway 2 are shown in *Figure A-1 – Project Limits* (Appendix A).

The project is geographically based on the US State Plane (Florida Western Zone, feet, 1983) horizontal datum and the North American Vertical Datum of 1988 (NAVD88) (feet). All stations are referenced to the Baseline Survey.

As shown in *Figure A-1* in Appendix A, the project Right-of-Way (ROW) is in:

- Sections 4, and 5 of Township 19 South and Range 18 East
- Sections 19, 20, 29, 30, 32 of Township 18 South and Range 18 East

The project area is characterized by closed drainage basins. Runoff during rainfall events is conveyed as sheet flow or shallow concentrated flow along natural gullies or roadside ditches to localized depressions or stormwater ponds in each basin. Based on a review of the USDA Soil Survey and past experience in the project area, the near-surface sandy soils along the project ROW are estimated to have a high infiltration potential. Accordingly, any runoff draining to the depression areas will generally percolate into the underlying soils and discharge directly into the groundwater table. Nevertheless, there is still potential during severe rainfall events for stormwater to build up and overflow into adjoining basins. As the project progresses, field infiltration testing will be performed to support this assertion and finalize the design.

The objective of this report is to determine the size and preferred locations for the construction of stormwater management facilities for runoff from Phase 2 of Suncoast Parkway 2. Alternative pond locations have been developed for each drainage basin and each alternative has been evaluated to develop a preferred pond location for each basin. Design considerations for each pond site location include hydraulic data, hydrology (land use cover, soil types, seasonal high-water elevations), environmental and cultural impacts, and economic factors including Right-of-Way (ROW) acquisition costs.

The project is divided into 3 major post-development drainage basins, referred to as Basins 2-5, 2-6, and 2-7. The basin boundaries and alternative stormwater pond locations for each basin are shown on Exhibits C-1 and C-2 located in Appendix C.

The outcomes of the pond site evaluation are provided in the pond site evaluation matrix for each basin, included in Appendix E. A summary of the information included in the Pond Site Evaluation Matrix is shown in *Table 1 – Pond Site Evaluation Matrix Summary.*

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Table 1 - Pond Site Evaluation Matrix Summary

Basin	Pond Site	Total Cost	Land Use	Wetland Impacts	Contamination Risk	Listed Species & Habitat Impact Potential	Pond Site Ranking
2-5	Alt. 1	$898,633	Woods/Residential	NO	LOW	MODERATE	#1
	Alt. 2	$937,047	Open Space/ Woods	NO	LOW	MODERATE	#2
	Alt. 3	$926,661	Open Space	NO	LOW	LOW	#3
	Alt. 4	$204,569	Woods	NO	NO	MODERATE	#1
	DRA-E	$1,326,836	Woods/Residential	NO	LOW	LOW	#1
2-6	Alt. 1	$521,907	Open Space	NO	LOW	LOW	#2
	Alt. 2	$257,283	Woods	NO	LOW	LOW	#2
	Alt. 3	$945,799	Open Space/ Woods	NO	MEDIUM	LOW	#1
2-7	Alt. 1	$434,669	Woods	NO	LOW	LOW	#1
	Alt. 2	$128,294	Woods	NO	LOW	LOW	#2
	Alt. 3	$479,363	Quarry	NO	LOW	LOW	#3
Offsite	DRA-1A	$76,094	Quarry	NO	LOW	LOW	#1

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INTRODUCTION

Purpose of Report

The purpose of the Pond Siting Report is to identify preferred locations for the construction of ponds to manage the stormwater runoff from Phase 2 of Suncoast Parkway 2. The stormwater management facilities are to be designed to capture and treat stormwater runoff from the 8-lane ultimate typical section.

Specifically, the report outlines a minimum of three alternative pond site locations for each drainage basin identified, provides quantitative analysis of required pond sizes and provides a recommended stormwater management system for each basin. Each pond site was evaluated against and identifies a range of criteria including hydrology, environmental impacts, wetland impacts, impacts to conservation areas and species, impacts to cultural resources, as well as economic factors such as Right-of-Way (ROW) acquisition costs and construction costs.

Project Overview

The Suncoast Parkway 2 (SR 589), Phase 2 is a proposed limited-access facility, which will extend from the northern terminus of the existing Suncoast Parkway (Phase 1) just south of SR 44 (West Gulf to Lake Highway) to CR 486 (West Norvell Bryant Highway). See *Figure A-1 – Project Limits* (Appendix A).

In conjunction with the existing Suncoast Parkway (Suncoast Parkway 1) and Veterans Expressway, Suncoast Parkway 2 will provide a continuous limited-access toll road facility extending from Tampa to Citrus County. The roadway will be designed to accommodate future projected traffic volumes along the "Suncoast" corridor (Hillsborough, Pinellas, Pasco, Hernando, and Citrus Counties) as well as deficiencies in the existing transportation network and will form an integral part of the Florida Interstate Highway System (FIHS).

Suncoast Parkway 2 is classified as a rural freeway facility and will be designed with a posted speed limit of 70 mph. The typical section for Suncoast Parkway 2, Phase 2 as well as typical sections for intersection streets which will be modified are provided in *Figure A-4 – Typical Section* located in Appendix A.

As shown in Appendix A, the roadway will initially be constructed with four 12-foot, median separated travel lanes (two lanes in each direction). The median will be grassed. The ultimate condition will be eight 12-foot travel lanes (four lanes in each direction) separated by a median barrier wall). A 12-foot outside shoulder (10-foot paved) and an 8-foot inside shoulder (4-foot paved) will be provided. Roadside ditches will be located adjacent to each travel lane. They will have a trapezoidal cross-section with a typical base width of 5 feet and side slopes of 1V:6H to 1V:4H. A 12-foot public multi-use trail (referred to as the Suncoast Trail) will also be constructed on the west side of the roadway. The ROW for the Parkway will have a typical width of 300 feet. The ROW for the Suncoast Trail will have a width of 50 feet, providing a total ROW width for the project of 350 feet.

The proposed roadway will extend over or under intersecting roadways and interchanges will be constructed at intersections with SR 44 and CR 486. Knoll Rd. will be realigned to accommodate the proposed interchange at CR 486.

A stormwater management system will be incorporated into the design of the Suncoast Parkway 2, Phase 2. The stormwater management system will be designed to provide stormwater attenuation, compensatory

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historic basin storage, as well as suitable water quality treatment measures to ensure that the adjoining land parcels and environment are not adversely impacted as a result of the project.

The project is located within the jurisdiction of the Southwest Florida Water Management District (SWFWMD). Therefore, the stormwater management system will also need to be designed to meet SWFWMD stormwater storage and water quality treatment volume requirements.

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PROJECT DESCRIPTION

Project Location

The Suncoast Parkway Project is divided into three construction segments: Suncoast Parkway 1, Suncoast Parkway 2, and Suncoast Parkway 3. Suncoast Parkway 2, Phase 1 extends from US 98 to SR 44. This report addresses the stormwater management system for Suncoast Parkway 2, Phase 2 which extends from SR 44 to CR 486 (West Norvell Bryant Highway) in Citrus County, Florida. The project limits are from Sta. 4252+26 to Sta. 4385+00, a total length of approximately 2.7 miles. The extent of Phase 2 of Suncoast Parkway 2 is shown in *Figure A-1 – Project Limits* (Appendix A).

As shown in *Figure A-1* (Appendix A), the project Right-of-Way is located as follows:

- Sections 19, 20, 29, 30, 32 of Township 18 South and Range 18 East

Project Datum

The project employs the US State Plane (Florida Western Zone, feet, 1983) horizontal datum and the North American Vertical Datum of 1988 (NAVD88) (feet). All stations are referenced to the Baseline Survey.

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DATA COLLECTION

General

A variety of data and information were collected to assist with the preparation of this report. A summary of this information is presented below.

Topographic Survey

LiDAR

Light Detection and Ranging (LiDAR) was acquired across the Project Corridor by IF Rooks as a sub-consultant to WBQ in Spring of 2019. The LiDAR data was acquired utilizing a helicopter at ± 600' Above Ground Level (AGL) at a density of ± 20 points per square meter and is considered to be compliant with the National Standard for Spatial Data Accuracy.

LAMP

Low Altitude Photogrammetric Mapping data was acquired by IF Rooks as a sub-consultant to WBQ in Spring of 2019 for State Road 44 and County Road 486 at an altitude of 350' AGL.

Fixed Wing for Planimetrics

Fixed Wing Flight by IF Rooks as a sub-consultant to WBQ was performed in Spring of 2019 at an altitude of 1000' AGL for planimetric mapping.

Ground Survey

Detailed topographic ground survey was performed by WBQ Survey. The ground survey included the collection of ground elevations at appropriate intervals to capture additional field data and is used to fill in obscure area, confirm LiDAR/LAMP/Fixed Wing survey, and detail specific areas as necessary.

Detailed drainage and utility ground survey was performed by DRMP as a sub consultant to WBQ. The drainage and utility survey are used to obtain data on of drainage pipes and utilities.

Field Reviews

Multiple field reviews were completed by WBQ Design & Engineering, Inc. staff and the project team. The field reviews were conducted to verify the topography across the project area, including the reliability of the delineated basin boundaries, identify the extent and density of vegetation cover and land use for use in deriving suitable runoff curve numbers, and to identify suitable alternative pond sites. The existing stormwater management facilities in the vicinity of the project alignment were also inspected.

Geotechnical Data

Tierra, Inc., as a sub-consultant to WBQ, performed detailed geotechnical analysis and prepared a Pond Siting Report Geotechnical Report which has been included as **Appendix D**. A map showing the major soil types in the vicinity of the project, as defined in the SCS Soil Survey, is provided in *Figure A-2* **(Appendix A).** *Table 2 – Summary of USDA Soil Information* also lists the major soil types, their hydrologic groupings, and depth to seasonal water table.

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Table 2 - Summary of USDA Soil Information

USDA Map Symbol and Soil Name	Soil Classification				pH	Seasonal High Water Table	
	Depth (in)	USCS	AASHTO	Saturated Hydraulic Conductivity (in/hr)		Depth (feet)	Months
(3) Candler fine sand, 0 to 5 percent slopes	0-5	SM, SP, SP-SM	A-2-4, A-3	6.0 - 50.0	4.5-6.0	>6.0	Jan-Dec
	5-74	SM, SP, SP-SM	A-2-4, A-3	6.0 - 50.0	4.5-6.0		
	74-80	SP-SM,SM, SP, SC-SM	A-2-4, A-3	6.0 - 20.0	4.5-6.0		
(4) Candler	0-6	SP-SM, SM	A-2-4, A-3	6.0 - 50.0	4.5-6.0	>6.0	Jan-Dec
	6-72	SP-SM, SM	A-2-4, A-3	6.0 - 50.0	4.5-6.0		
	72-80	SM, SP-SM, SC-SM	A-3, A-2-4	6.0 - 50.0	4.5-6.0		
(16) Arredondo fine sand, 0 to 5 percent slopes	0-8	SM, SP-SM	A-3, A-2-4	6.0 - 20.0	4.5-6.0	>6.0	Jan-Dec
	8-62	SM, SP-SM	A-3, A-2-4	6.0 - 20.0	4.5-6.0		
	62-69	SC-SM, SM	A-2-4, A-2-6	2.0 - 6.0	4.5-6.0		
	69-80	SC	A-6, A-7-6, A-2-4	0.6 - 6.0	4.5-6.0		
(18) Kendrick fine sand 5 to 8 percent slopes	0-7	SM, SP-SM	A-2-4, A-3	6.0 - 20.0	4.5-6.0	>6.0	Jan-Dec
	7-28	SM, SP-SM	A-2-4, A-3	6.0 - 20.0	4.5-6.0		
	28-73	SC	A-2-4, A-6, A-2-6	0.6 - 6.0	4.5-6.0		
	73-80	SC	A-6, A-2-6, A-2-4	0.6 - 6.0	4.5-6.0		
(20) Pits	INFORMATION NOT AVAILABLE						
(29) Astatula fine sand, 0 to 5 percent slopes	0-5	SP-SM	A-3, A-2-4	20.0 - 50.0	4.5-6.5	>6.0	Jan-Dec
	5-80	SP-SM	A-3, A-2-4	20.0 - 50.0	4.5-6.5		
(30) Astatula fine sand, 5 to 8 percent slopes	0-2	SP, SP-SM	A-3	20.0 - 50.0	4.5-6.5	>6.0	Jan-Dec
	2-80	SP, SP-SM	A-3	20.0 - 50.0	4.5-6.5		
(35) Sparr fine sand, 0 to 5 percent slopes	0-8	SM, SP-SM	A-3, A-2-4	6.0 - 20.0	4.5-6.5	1.5-3.5	July-Oct
	8-50	SM, SP-SM	A-2-4, A-3	6.0 - 20.0	4.5-6.5		
	50-59	SC, SC-SM, SM	A-2-4	0.6 - 2.0	4.5-6.5		
	59-80	SC, SC-SM	A-2, A-4, A-6	0.1 - 0.6	4.5-6.5		

Based on the groundwater measurements taken in the field and analysis performed, the groundwater table will be encountered at elevations ranging from approximately +5 to +10 feet, NAVD88. These values are relatively consistent with the potentiometric surface elevation of the upper Floridian Aquifer along the project alignment.

Utilities

Due to the rural nature of the project corridor, utilities in the vicinity of the proposed pond sites primarily consist of overhead electric distribution lines and buried telephone lines. The majority of the residential lots impacted by the proposed roadway improvements and associated stormwater treatment ponds have private drinking water wells and on-site septic tanks and drain fields, so there are no public potable water supply or wastewater conveyance systems that will need to be modified for this project. Most of the utilities are situated within or immediately adjacent to existing roadway ROW or within dedicated utility easements.

There are existing utilities that extend across or traverse adjacent to some of the potential pond sites and they include:

- Overhead electric distribution lines and buried telephone lines along the southeastern side of Pond 2-5, Alt. 1. These utilities are along the southern right-of-way of an existing residential roadway known as W. Shady Knoll Place, which will be encompassed by the pond if this alternate is selected.
- Overhead electric distribution lines and buried telephone lines on the east side of Pond 2-5, Alt. 3. These utilities are along the west right-of-way of W. Maylen Avenue.
- Overhead electric distribution lines and buried telephone lines on the east side of Pond 2-6, Alt. 2. These utilities are along the west side of an existing unimproved residential roadway known as N. Jali Point.
- Overhead electric distribution lines and buried telephone lines on the west side the southern lobe of Pond 2-7, Alt. 2. These utilities are along the east right-of-way of an existing unimproved residential roadway N. Knoll Road.
- Overhead electric distribution lines at the southern tip of the northern lobe of Pond 2-7, Alt. 2. These power lines serve the Keepit Safe Storage and Moving facility and are located along the south side of an unimproved access road to that commercial site.
- A buried telephone cable and a potable water line that crosses the west side of Pond 2-7, Alt. 3. These utilities are along the east side of an abandoned on-site access road that extends south from CR 486 onto the proposed pond site.

The utilities described above serve only a limited number of properties that would most likely be acquired if the proposed stormwater ponds are constructed in those locations and would not reduce the level of service provided to other areas adjacent to the project corridor.

There is a 280-foot wide Duke Energy electric transmission fee simple right-of-way located approximately 1,113 feet northeast of SR 44. Within this right-of-way, Duke Energy has three major transmission lines that consist of 500 kV, 230 kV and 69 kV circuits. Florida Gas Transmission also has two 36-inch high pressure transmission mains in an easement along the southernmost side of the Duke Energy right-of-way. Ponds 2-5, Alt. 1 and 2-5, Alt. 2 are located immediately adjacent to the right-of-way. The proposed pond sites do not directly impact these utilities. The pond side slopes should provide sufficient separation from the right-of-way and will not impose any adverse effects on the embedment of the poles carrying the 69 kV electric transmission circuit or the pipe bedding of the gas transmission mains.

All private residential drinking water wells and on-site sewage disposal systems that will be taken out of service to accommodate the project improvements must be abandoned in conformance with Chapter 40D-3.531 of the Florida Administrative Code and the requirements of the Citrus County Health Department, respectively.

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DESIGN CRITERIA

Roadway Geometry

Typical Section

The Typical Section Package for the roadway is included in **Appendix A**. The Suncoast Parkway 2, Phase 2 will initially be constructed with two 12-foot travel lanes in each direction with 10-foot paved outside shoulders and 4-foot paved inside shoulders. The travel lanes will be separated by a 74-foot grassed median. The roadway embankments will grade down to the existing natural surface at a typical slope of 1V:6H. Roadside ditches will also be provided adjacent to each travel lane to convey stormwater runoff and will consist of a trapezoidal cross-section with a typical base width of 5 feet and side slopes of 1V:6H to 1V:4H.

As traffic volumes along the roadway increase and funding becomes available, the initial four lane typical section will be widened to eight 12-foot travel lanes (four lanes in each direction). The two outside travel lanes from the initial typical section will remain and will be supplemented by two additional travel lanes that will extend into the grassed median. The 10-foot outside paved shoulder will be maintained, and a new 12-foot paved inside shoulder with barrier wall will be provided. The roadside ditches constructed as part of the initial typical section will be retained for the ultimate typical section.

A 12-foot wide paved public trail (referred to as the Suncoast Trail) will also be constructed on the western side of the roadway.

Horizontal Alignment

The horizontal alignment for Suncoast Parkway 2, Phase 2 is shown on *Figure A-1 – Project Location Map* included in **Appendix A**. The horizontal alignment has been refined from the PD&E alignment to avoid impacts to N. Maylen Ave. and is based on the proposed connection points at SR 44 and CR 486. The connection at CR 486 was modified to allow for a future extension of Suncoast Parkway. Additionally, the proposed horizontal curve was refined to meet the horizontal sight offset requirements for the future 8-lane condition while keeping the superelevation transitions off the SR 44 bridge. The posted and design speed for the proposed alignment is 70 miles per hour.

Vertical Alignment

The vertical alignment for the proposed roadway has been optimized to minimize the amount of cut and fill along the project corridor while giving consideration other to design constraints such as grade requirements, overhead power line clearances through the Duke Energy Easement, and a proposed bridge over the Knoll Rd. realignment.

The proposed roadway will extend over SR 44, under the Duke Energy power lines, over West Sanction Road, and terminate at grade at CR 486.

Right-of-Way

The ROW for the proposed roadway has a typical width of 300 feet, which increases as necessary to accommodate the interchange ramps. The ROW for the Suncoast Trail has a width of 50 feet. The total ROW width is 350 feet.

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It will be necessary to acquire additional ROW at various locations along the project corridor to accommodate stormwater treatment facilities. FTE is currently in the process of acquiring ROW within the corridor for both stormwater management and roadway purposes.

Agency Coordination

FDOT

The Florida Department of Transportation requires stormwater management systems to comply with the following regulatory requirements:

- Chapter 14-86, Florida Administrative Code
- Section 373.4596, Florida Statues
- Chapter 62-40, Florida Administrative Code
- National Pollutant Discharge Elimination System

A summary of the regulatory requirements applicable to the design of stormwater management facilities is provided in *Table 3*.

Southwest Florida Water Management District (SWFWMD)

This project is within the jurisdiction of the Southwest Florida Water Management District (SWFWMD). The SWFWMD will regulate and control stormwater discharge and impacts to surface waters for this project. The SWFWMD will require an Environmental Resource Permit (ERP) for this project prior to initiating construction.

A pre-application meeting was held on June 10, 2020 with SWFWMD. Minutes from this meeting are included in **Appendix J**.

A summary of SWFWMD requirements is listed in *Table 3*.

Citrus County

The project is in Citrus County and will therefore need to comply with the requirements of Citrus County's Land Development Code (CCLDC) for side streets to be owned by the County.

A coordination meeting was held on May 8, 2020 with Citrus County staff. Minutes from this meeting are included in **Appendix J**.

A summary of Citrus County requirements is included in *Table 3*.

US Fish and Wildlife Service

Florida's Turnpike Enterprise has conducted preliminary coordination with the United States Fish and Wildlife Service (USFWS) to determine the need to conduct protected species surveys, permitting requirements, and potential mitigation requirements for the proposed Suncoast Parkway 2 from SR 44 to CR 486. A summary of this coordination is included in Appendix G.

Florida Fish and Wildlife Conservation Commission

The Florida Fish and Wildlife Conservation Commission (FWC) will provide commentary during the ERP review process. The FWC will conduct field reviews and comment to SWFWMD about any

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adverse effects that the proposed activity may have on state protected wildlife species and their habitat.

FDEP

The United States Environmental Protection Agency (EPA) requires permits for stormwater discharge in association with the National Pollution Discharge Elimination System (NPDES) and the Federal Clean Water Act. As the project impacts more than one acre, an NPDES permit will be required. The application requirements include a stormwater pollution prevention plan indicating both structural and non-structural controls to be implemented.

The re-alignment of Knoll Road will require the relocation of an existing stormwater management facility. This existing facility is located outside the filled in landfill cells within the Rooks Property and serves to capture runoff from the cells. This pond relocation will require modifications to the existing FDEP Environmental Resource Permit for the existing pond. A pre-application meeting was held with FDEP staff on July 15, 2020. Minutes from this meeting are included in **Appendix J**.

The Florida Department of Environmental Protection (FDEP) is the NPDES permitting authority for the state of Florida. The FDEP is responsible for reviewing and issuing permits as well as performing compliance and enforcement activities under the NPDES.

Stormwater Quality & Quantity Requirements

Water quality requirements for Florida are outlined in Chapter 62-40, Florida Administrative Code. Section 62-40.431 (Stormwater Management Program – SMP) states that the primary goal of the SMP is to maintain pre-development stormwater characteristics during and after construction and development.

In order to meet this requirement, SWFWMD requires that sufficient volume be provided in any stormwater ponds to treat runoff from the first inch of rainfall from any contributing basin area. In instances where the contributing basin area is less than 100 acres, only runoff from the first half inch of rainfall must be treated.

A summary of the applicable water quality requirements for the project is provided in *Table 3*.

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Table 3 - Stormwater Design Criteria

Pond Design Element	FDOT	SWFWMD	Citrus County	Source
Attenuation (Closed Basin)	Pre/Post up to 100-yr storm (critical durations up to 10 days)	Pre/Post 100-yr storm	Match SWFWMD	FDOT DM[1] (Sect. 5.2.1) SWFWMD[2] (Sect. 4.1) CCLDC[3] (Sect. 6320)
Runoff Calculation Method	NRCS Unit Hydrograph Method	SCS Unit Hydrograph Method	Match SWFWMD	FDOT DM (Sect. 5.4.2) SWFWMD (Sect. 6.7) CCLDC (Sect. 6620)
Rainfall Distribution	Drainage Manual Appendix E	Natural Resource Conservation Service Type II Florida Modified	Match SWFWMD	FDOT DM SWFWMD (Sect. 6.3) CCLDC (Sect. 6620)
Stormwater Management Facility Type	Dry Retention	Dry Retention	N/A	FDOT DDG[4] (Sect. 9.3.4.3) SWFWMD (Sect. 4.1)
Required Treatment Volumes	Match WMD requirements	Treat runoff from first inch of rainfall or from first ½ inch of runoff if basin < 100 ac.	½ inch from developed area	FDOT DDG (Sect. 9.3.1) SWFWMD (Sect. 4.1) CCLDC (Sect. 6320)
Max. Depth	N/A	Not to be excavated to within 2' of underlying limestone	Not to be excavated to within 3' of underlying limestone, 10' max.	SWFWMD (Sect. 5.4.1(b)) CCLDC (Sect. 6620)
Volume Recovery Time	½ volume in 7 days Total volume in 30 days	Total volume in 72 hours, only that recovered within 36 hours may be counted as treatment volume	Total volume in 72 hours	FDOT DM (Sect. 5.4.1.3) SWFWMD (Sect. 4.1) CCLDC (Sect. 6620)
Freeboard	1 ft.	N/A	6 in.	FDOT DM (Sect. 5.4.4.2) CCLDC (Sect. 6620)
Berm Width	15 ft. maintenance berm 20 ft. between control elevation & R/W	Min. 20 ft. maintenance berm	Min. 15 ft. maintenance berm	FTE DM[5] (Sect. 5.4.4.2) SWFWMD (Sect. 5.4.2) CCLDC (Sect. 6620)
Pond Shape	N/A	Aesthetically pleasing shapes	N/A	FDOT DM (Sect. 5.4.4.2) FDOT DDG (Sect. 9.3.2)

[1] FDOT Drainage Manual (Jan. 2020)
[2] SWFWMD ERP Applicant's Handbook, Vol. II (June 2018)
[3] Citrus County Land Development Code (June 2012)
[4] FDOT Drainage Design Guide (Jan. 2020)
[5] Turnpike Supplement to the FDOT Drainage Manual (April 2019)

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ENVIRONMENTAL LOOK AROUND

Partnering opportunities for SWFWMD, FDOT District 7, FDEP, and Citrus County are currently being explored with each agency. Meetings have been held with these agencies to coordinate criteria requirements and potential joint-use stormwater management facilities.

SWFWMD

A pre-application meeting was held on June 10, 2020 with SWFWMD staff to coordinate project requirements and confirm the permitting approach. Minutes from this meeting are included in **Appendix J**. Partnering opportunities were discussed at this meeting. While SWFWMD has no stormwater needs that could be coordinated with this project, the design team was directed to coordinate further with Citrus County for local partnership opportunities.

FDOT District 7

A meeting was held on May 6, 2020 with FDOT District 7 staff to coordinate project requirements. Minutes from this meeting are included in **Appendix J**. D7 staff does not currently have any planned improvements on their facilities within the project limits. The proposed design of Suncoast Parkway 2 Phase 2 will impact an existing stormwater facility on the north side of SR 44. The impacts to this pond will be compensated for within the proposed pond DRA-E. D7 agreed to this approach and additional coordination for stormwater management requirements for this facility is ongoing.

Citrus County

A meeting was held on May 8, 2020 with Citrus County staff to coordinate project requirements. Minutes from this meeting are included in **Appendix J**. Citrus County expressed interested in shared stormwater facilities within the existing quarry located on the Rooks Property (site of proposed Pond 2-7, Alt. 3). This is a large site and Citrus County has interest in future development on this property. Additional coordination is ongoing to determine appropriate design measures for this site.

FDEP

A pre-application meeting was held with FDEP staff on July 15, 2020 to confirm the permitting approach for the landfill pond relocation (Pond DRA-1A). Minutes from this meeting are included in **Appendix J**.

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EXISTING AND PROPOSED DRAINAGE CONDITIONS

Existing Drainage Conditions

The project area is characterized by closed drainage basins. These basins have the potential to overtop and discharge into adjoining basins during larger storm events. Runoff during rainfall events is conveyed as sheet flow or shallow concentrated flow to localized depressions in each basin. Soils underlying the project ROW are generally sands belonging to the SCS hydrologic soils group "A". As a result, stormwater runoff can generally percolate through the underlying sandy soils in these depressional areas. Testing performed by Tierra, Inc. across the study area also confirms the high infiltration potential across much of the project corridor.

The project is located within the Homosassa River and Crystal River Basins as defined by the SWFWMD. These basins form part of the larger Upper Coastal Areas basin.

The lower reaches of the Homosassa River and Crystal River are classified as "Outstanding Florida Waters." However, none of the closed basins analyzed as part of this study overtop and drain directly to areas classified as "Outstanding Florida Waters."

The pre-development basin boundaries were delineated as part of FPID 405270-4 and permitted by SWFWMD in 2015 (Permit No. 43016897.006). The pre-development basin map is included in Appendix B.

The existing sub-basins impacted by the proposed project limits have been grouped into one of two SWFWMD basins – Homosassa River Basin and Crystal River Basin. A description of the existing drainage characteristics of each basin is provided below.

Homosassa River Basin

The Homosassa River Basin extends across the southern portion of the project between Sta. 4252+25 and Sta. 4293+10. It contains existing sub-basins H1320, H1355, H1365_B, H1295, 2-128 which cover a combined area of 84.66 acres. The location of each sub-basin is shown in *Figures B-1 and B-2* (Appendix B).

All sub-basins within the Homosassa River basin are closed and do not contribute any surface water runoff directly to the Homosassa River.

A summary of the existing sub-basins located within the Homosassa River Basin is included in *Table 4 – Summary of Existing Homosassa River Sub-Basins*.

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Table 4 - Summary of Existing Homosassa River Sub-Basins

Existing Basin Name	Begin (CL Const. SR 589)	End (CL Const. SR 589)	SWFWMD Basin
H1365_B	4268+46	4273+38	Homosassa River
H1355	4271+40	4283+06	Homosassa River
H1295	4270+73	4288+85	Homosassa River
H1320	4272+65	4286+61	Homosassa River
2-128	4285+28	4294+45	Homosassa River

The soils encountered across the basin are Candler Fine Sand, Arrendondo Fine Sand, Kendrick Fine Sand, Sparr Fine Sand and Astatula Fine Sand. All soils across the basin belong to the SCS hydrologic group 'A'.

Existing land use across the basin is varied comprising a mix of woods, open space (grass), low density residential, commercial and quarries.

Runoff within the basin is conveyed into localized depressional areas or existing dry retention ponds. Runoff within the depressional areas and stormwater ponds generally percolates into the underlying soils. However, there is potential for stormwater to build up and discharge into adjoining sub-basins during severe storms.

Several previous permits have been issued for properties located within or adjacent to the basin. A discussion of the potential impacts of the project on each existing permit is included in **Appendix F**.

Crystal River Basin

The Crystal River Basin is located at the northern end of the project. It includes sub-basins 2-129 to 2-140, which cover a combine area of 766.25 acres. The basin limits are from Sta. 4293+10 to Sta. 4382+70.

Each sub-basin within the Crystal River Basin is closed and does not directly contribute surface water runoff to the Crystal River.

A summary of the existing sub-basins located within the Homosassa River Basin is included in *Table 5 – Summary of Existing Crystal River Sub-Basins*.

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Table 5 - Summary of Existing Crystal River Sub-Basins

Existing Basin Name	Begin (CL Const. SR 589)	End (CL Const. SR 589)	SWFWMD Basin
2-129	4290+38	4305+34	Crystal River
2-130A	4290+52	4305.56	Crystal River
2-131	4304+73	4320+17	Crystal River
2-132	4318+88	4333+74	Crystal River
2-133	4332+70	4355+57	Crystal River
2-134	4354+25	4362+47	Crystal River
2-135	4361+22	4368+41	Crystal River
2-136	4362+67	4379+62	Crystal River
2-137	4375+72	4395+80	Crystal River
2-138	4386+96	4400+67	Crystal River
2-139A	4385+25	4416+38	Crystal River
2-139B	4414+05	4415+25	Crystal River
2-139C	4406+53	4410+83	Crystal River
2-140	4400+60	4408+03	Crystal River

The soils encountered across the basin are Candler Fine Sand, Arrendondo Fine Sand, Kendrick Fine Sand, Sparr Fine Sand and Astatula Fine Sand. All soils across the basin belong to the SCS hydrologic group 'A'.

Existing land use in the Crystal River Basin comprises open space (grass), residential, commercial, industrial, woods as well as several quarries and mines. Several roadways bisect the project corridor and runoff in the Crystal River basin travels towards the ROW along natural gullies as well as along man-made drainage features.

Runoff within the basin is conveyed into localized depressional areas or existing dry retention ponds. Runoff within the depression areas and stormwater ponds generally percolates into the underlying soils. However, there is potential for stormwater to build up and discharge into adjoining sub-basins during severe storms.

Several previous permits have been issued for properties located within or adjacent to the basin. A discussion of the potential impacts of the project on each existing permit is included in **Appendix F**.

Proposed Drainage Conditions

The project will involve earthwork in the vicinity of the ROW as well as construction of additional impervious surfaces. This will modify the existing drainage patterns in the vicinity of the ROW. The stormwater management system for the project will be designed to mitigate any adverse stormwater impacts associated with the project.

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Specifically, any filling across depression areas will remove some historical basin storage. Therefore, it will be necessary to convey any off-site runoff currently draining to these depression areas directly to stormwater ponds located in each basin. This will ensure that suitable compensatory storage is provided for all impacted depression areas. Off-site runoff from bisected existing basins will be conveyed across the project ROW using a suitably sized cross-drain as necessary.

Earthwork activities may also impede the path of off-site runoff draining across the ROW. Therefore, runoff from any residual offsite areas will also be conveyed across the roadway through cross-drains or roadside ditches.

Runoff from the additional impervious area proposed by this project will be conveyed directly to stormwater ponds via an open drainage system. The stormwater ponds will be designed to ensure that water quality treatment and storage volumes are satisfied. Roadside ditch treatment areas will not be accounted for in the pond volume calculations.

The project limits have been divided into 3 major post-development drainage basins based primarily on the vertical alignment of the proposed roadway. Existing drainage basin boundaries and impacted depression areas were also taken into consideration when creating the post-development boundaries. The post-development basin boundaries are shown in *Figures C-1 and C-2* (**Appendix C**). See *Table 6 – Summary of Proposed Drainage Basins* for a synopsis of the proposed conditions.

Table 6 - Summary of Proposed Drainage Basins

Proposed Basin Name	Begin (CL Const. SR 589)	End (CL Const. SR 589)
2-5	4275+00	4307+00
2-6	4307+00	4361+40
2-7	4361+40	4402+63

A minimum of three alternative pond locations were identified for each proposed roadway basin and evaluated to determine their suitability for implementation as part of the stormwater management system. The pond sites were identified based on consideration of existing topography, the proposed road profile, SCS soil mapping, existing land use, existing utilities, and parcel maps.

A brief description of each basin and each pond alternative is provided below.

Basin 2-5

Basin 2-5 extends from south of the begin project limits to Sta. 4307+00. It is inclusive of phase 2 of Suncoast Parkway 2 and the previously constructed phase (FPID 405270-4). The runoff from the begin project limits to Sta. 4275+00 will be collected and treated within the existing ponds constructed by the adjacent segment of Suncoast Parkway 2. The runoff between Sta. 4275+00 and Sta. 4307+00 will be collected via an open drainage system and discharged to a proposed pond. Basin 2-5 also collects runoff from sections of existing sub-basins 2-126, 2-128, 2-129, 2-130, and 2-131.

The alternative pond sites analyzed for Basin 2-5 are depicted in **Appendix C,** *Figure C-1* and are referred to as Ponds 2-5, Alt. 1, Alt. 2, Alt. 3, and Alt. 4. Each pond will be designed to capture runoff from an on-

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site drainage area of 59.36 acres. Pond DRA-E was designed as a replacement stormwater management facility for the existing SR 44 pond that will be impacted by the proposed design. Pond DRA-E will serve SR 44 only.

Pond site descriptions are provided below.

Pond 2-5, Alt. 1.

Pond 2-5, Alt. 1 is a dry retention pond located on the northwest quadrant of the SR 44/SR 589 interchange, adjacent to the multi-use path. The pond extends from Sta. 4274+40 to Sta. 4283+50 and occupies an area of approximately 7 acres. The existing elevation across the site varies from 59 to 110 feet. Access to the pond site could be provided directly from the ROW. The existing site is comprised of a combination of coniferous-hardwood forest and residential homes. Overhead electric distribution lines and buried telephone lines run along the southeastern side of the pond site. Thirteen (13) of the fifteen (15) parcels included in this pond site have already been acquired by FTE as part of the Advance ROW Acquisition Phase. The soil types encountered at the site are Candler fine sand and Kendrick fine sand. The estimated ROW cost for this alternative is $252,263. The construction cost is estimated to be approximately $646,370. The total cost for this alternative is **$898,633.**

Pond 2-5, Alt. 2

Pond 2-5, Alt. 2 is a dry retention pond northwest of the SR 44/SR 589 interchange just north of the Duke Energy Right-of-Way, adjacent to the multi-use path. The pond extends from Sta. 4290+95 to Sta. 4296+88 and occupies an area of approximately 8 acres. The existing elevation across the site varies from 84 to 116 feet. Access to the pond site could be provided directly from the ROW. The existing site is comprised of a hardwood forest within an active cattle pasture. The soil type encountered at the site is primarily Arredondo fine sand. A deep (>20') clay layer was encountered about 15 feet below the ground surface. Over-excavation to replace a portion of the clay with sandy soils to help facilitate infiltration is an option. However, due to the depth of the confining clay layer over-excavation may not yield improved infiltration rates but instead create a "bath-tub" effect. The estimated ROW cost for this alternative is $480,247. The construction cost is estimated to be approximately $456,800. The total cost for this alternative is **$937,047.**

Pond 2-5, Alt. 3

Pond 2-5, Alt. 3 is a dry retention pond northeast of the SR 44/SR 589 interchange. The pond extends from Sta. 4284+63 to Sta. 4292+23 and occupies an area of approximately 5 acres. The existing elevation across the site varies from 72 to 89 feet. The deep clay layer encountered in Pond 5, Alt. 2 was also encountered at this site, however the layer was much shallower (approximately 5 feet below the ground surface). Access to the pond site could be provided directly from the ROW. The existing site is a fenced, active pasture and the soil types encountered at the site are Candler fine sand and Sparr fine sand. The estimated ROW cost for this alternative is $705,035. The construction cost is estimated to be approximately $221,626. The total cost for this alternative is **$926,661.**

Pond 2-5, Alt. 4

Pond 2-5, Alt. 4 is comprised of an infield dry retention pond located within the SR 44/SR 589 interchange. The pond extends from Sta. 4271+19 to Sta. 4277+50 and occupies an area of approximately 2 acres including a portion of an existing retention pond serving SR 44. The existing elevation across the site varies

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from 45 to 67 feet. Access to the pond site could be provided directly from the ROW. The pond does not have sufficient capacity to capture all the runoff from Basin 2-5 and compensate for the impacts to the existing stormwater management facilities from both the proposed roadway and drainage features. Therefore, it would need to be supplemented with an additional pond site. The existing site is a mixture of herbaceous habitat, forested habitat, and an existing FDOT D7 stormwater management facility and the soil types encountered at the site are Candler fine sand and Kendrick fine sand. A deep clay layer was also encountered at this site approximately 5-10 feet below the ground surface. The infield pond is located within the project ROW and would not require additional ROW acquisition. The construction cost is estimated to be approximately $204,569. The total cost for this alternative is **$204,569.**

Pond DRA-E

Pond DRA-E is a dry retention pond located on the southwest quadrant of the SR 44/SR 589 interchange, adjacent to SR 44. The pond extends along SR 44 between Sta. 330+20 to Sta. 339+00 and occupies an area of approximately 4.5 acres. The existing elevation across the site varies from 55 to 65 feet. Access to the pond site could be provided directly from the ROW. The pond site would compensate for the impacts to the existing SR 44 stormwater management facilities from both the proposed roadway and drainage features. The existing site is primarily forested and the soil types encountered at the site are Candler fine sand and Kendrick fine sand. The estimated ROW cost for this alternative is $1,097,779. The construction cost is estimated to be approximately $229,057. The total cost for this alternative is **$1,326,836.**

Basin 2-6

Basin 2-6 extends from Sta. 4307+00 to Sta. 4361+40. Basin 2-6 also collects runoff from sections of existing sub-basins 2-131, 2-132, 2-133, and 2-134.

The alternative pond sites analyzed for Basin 2-6 are depicted in **Appendix C,** *Figures C-1 & C-2* and are referred to as Ponds 2-6, Alt. 1, Alt. 2, and Alt. 3. Each pond will be designed to capture runoff from an on-site drainage area of 67.86 acres.

Pond site descriptions are provided below.

Pond 2-6, Alt. 1.

Pond 2-6, Alt. 1 is a dry retention pond located just north of W Sanction Road on the left-hand side of the ROW adjacent to the multi-use path. The pond extends from Sta. 4324+60 to Sta. 4333+00 and occupies an area of approximately 6 acres. The existing elevation across the site varies from 68 to 102 feet. Access to the pond site could be provided directly from the ROW. The existing site is comprised of an existing quarry where extensive excavation has previously been completed. In order to minimize the embankment required for the proposed roadway, the pond has been placed on the high side of the parcel away from the quarry. The soil type encountered at the site is primarily Candler fine sand. The estimated ROW cost for this alternative is $190,314. The construction cost is estimated to be approximately $331,593. The total cost for this alternative is **$521,907.**

Pond 2-6, Alt. 2

Pond 2-6, Alt. 2 is a dry retention pond on the right-hand side of the ROW. The pond extends from Sta. 4290+95 to Sta. 4296+88 and occupies an area of approximately 3 acres. The pond does not have sufficient capacity to capture all the runoff from Basin 2-6. Therefore, this pond alternative will need to be

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supplemented with an alternative pond site. The existing elevation across the site varies from 87 to 115 feet. Access to the pond site could be provided directly from the ROW. The existing site is comprised of improved pasture and forest. The soil type encountered at the site is primarily Arredondo fine sand. The estimated ROW cost for this alternative is $142,115. The construction cost is estimated to be approximately $115,168. The total cost for this alternative is **$257,283.**

Pond 2-6, Alt. 3

Pond 2-6, Alt. 3 is a dry retention pond on the right-hand side of the ROW. The pond extends from Sta. 4337+00 to Sta. 4346+00 and occupies an area of approximately 8 acres. The existing elevation across the site varies from 50 to 75 feet. Access to the pond site could be provided directly from the ROW. The existing site is mostly forested. The soil type encountered at the site is Candler fine sand. The estimated ROW cost for this alternative is $445,386. The construction cost is estimated to be approximately $500,413. The total cost for this alternative is **$945,799.**

Basin 2-7

Basin 2-7 extends from Sta. 4361+40 to Sta. 4402+63. Basin 2-7 also collects runoff from sections of existing sub-basins 2-134, 2-135, 2-136, and 2-137.

The alternative pond sites analyzed for Basin 2-7 are depicted in **Appendix C,** *Figure C-2* and are referred to as Ponds 2-7, Alt. 1, Alt. 2, and Alt. 3. Each pond will be designed to capture runoff from an on-site drainage area of 59.49 acres.

Pond site descriptions are provided below.

Pond 2-7, Alt. 1.

Pond 2-7, Alt. 1 is a dry retention pond on the right-hand side of the ROW. The pond extends from Sta. 4361+70 to Sta. 4367+50 and occupies an area of approximately 3 acres. The existing elevation across the site varies from 82 to 106 feet. Access to the pond site could be provided directly from the ROW. The existing site is predominately comprised of xeric oak forest. The soil types encountered at the site are Candler fine sand and Astatula fine sand. Two (2) of the three (3) parcels required for this pond site are already owned by FTE. The estimated ROW cost for this alternative is $170,302. The construction cost is estimated to be approximately $264,367. The total cost for this alternative is **$434,669.**

Pond 2-7, Alt. 2

Pond 2-7, Alt. 2 is comprised of a dry retention pond located directly adjacent to the SR 589/Knoll Road interchange. The pond extends from Sta. 4377+13 to Sta. 4383+83 and occupies an area of approximately 3 acres. The existing elevation across the site varies from 71 to 92 feet. Access to the pond site could be provided directly from the ROW. The existing site is a coniferous-hardwood forest, and the soil types encountered at the site are Candler fine sand and Astatula fine sand. The estimated ROW cost for this alternative is $236,053. The construction cost is estimated to be approximately $128,294. The total cost for this alternative is **$364,347.**

Pond 2-7, Alt. 3

Pond 2-7, Alt. 3 is a dry retention pond on the right-hand side of the ROW north of the proposed SR 589/Knoll Road interchange. The pond extends from Sta. 4391+00 to Sta. 4400+20 and occupies an area of

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approximately 6 acres. The existing site is located within a quarry where extensive excavation has been completed. A buried telephone cable and a potable water line crosses the west side of the pond site. Therefore, the existing elevation across the site varies from 26 to 90 feet. Access to the pond site could be provided directly from the ROW. The soil types encountered at the site are Candler fine sand and Astatula fine sand. This pond site is located completely within an already acquired FTE parcel and would not require any additional ROW acquisition. The construction cost is estimated to be approximately $479,363. The total cost for this alternative is **$479,363.**

Offsite Areas

Several local roads will need to be modified or realigned to accommodate Suncoast Parkway 2, Phase 2. Therefore, it will also be necessary to provide suitable stormwater management systems for these new roadways. These proposed roadways will be treated in adjacent linear swales.

The existing depressional areas impacted by the proposed improvements have been identified and volume calculations performed to quantify the appropriate amount of compensation required. The recommended pond alternatives have been sized to ensure adequate compensation volume is provided. Following the approval of the proposed profile, the impacted off-site areas will be finalized, and calculations performed to confirm the size of the necessary stormwater management sites.

Knoll Road Realignment

The selected alignment for SR 589 will have ramp connections to and from CR 486 at the current location of the Knoll Road intersection with CR 486. Knoll Road will be rerouted starting just north of Ziggy Street, where it will be extended along a new alignment to the west, then northward to tie into CR 486 opposite Pine Ridge Boulevard at the existing signalized intersection.

The proposed realignment has been coordinated with Citrus County and will utilize open space in the existing quarry known as the Rooks Property. This property is currently owned by FTE. The proposed alignment will fill in an existing stormwater management facility. This existing facility is located outside the filled in landfill cells and serves to capture runoff from the cells. This pond site will be relocated to an adjacent site outside the limits of the proposed alignment. The stormwater management and environmental considerations associated with this pond relocation are currently being coordinated with FTE, Citrus County, and the relevant permitting agencies. The relocated pond site (DRA-1A) was assigned a contamination risk rating of Medium due to the proximity of closed landfill cells. DRA-1A is located within the project ROW and would not require additional ROW acquisition. The construction cost is estimated to be approximately $76,094. The total cost for this alternative is **$76,094.**

Knoll Road will be treated in adjacent linear swales on either side of the proposed alignment.

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FLOODPLAIN AND ENVIRONMENTAL INFORMATION

Floodplains

There are no FEMA riverine floodplains within the project limits. A flood map exhibit is shown in *Figure A-5* (Appendix A).

However, as previously discussed, there are several depression areas located within or immediately adjacent to the project ROW that currently provide temporary storage for stormwater runoff (also referred to as "historic basin storage"). Some of these localized depressions have been designated by FEMA as "Zone AE" meaning the Base Flood Elevations associated with the 100-year storm have been determined. It will be necessary to provide compensatory storage volume for impacted depression areas to ensure that adjoining properties are not adversely impacted.

The stormwater management approach for the project will be to convey runoff from the impacted low areas to the proposed stormwater pond locations and retain all the runoff for the impacted basin within the proposed pond site. The stormwater ponds will capture all on-site runoff falling within the project ROW as well as all off-site runoff that drains to impacted low areas. This drainage approach will divert runoff from depressed areas to the roadway ponds which will eliminate the need for additional floodplain compensation.

Environmental Considerations

A field evaluation was conducted by qualified ecologists to evaluate the extent and configuration of wetlands and other surface waters and the potential for protected species to occur within and adjacent to the pond site alternatives. A full report on the findings is included in Appendix G – Pond Site Natural Environmental Evaluation.

The pond site alternatives selected for proposed construction of the Suncoast Parkway 2 from SR 44 to CR 486 were evaluated for presence of wetlands and protected wildlife species. None of the pond site alternatives contain wetlands. One stormwater treatment facility was identified within Pond Site 2-5, Alt 4. Since the stormwater treatment facility is an existing pond and will only be expanded, there is no loss of suitable wood stork foraging habitat as a result of the selection of the pond site alternative.

All pond sites contain suitable habitat for eastern indigo snake and gopher tortoises. Unavoidable impacts to these species will be permitted through coordination with USFWS and FWC. Pond site alternatives were ranked for potential to impact listed species or habitat. Three pond sites within Basin 2-5 (Alt 1, Alt 2, and Alt 4) may occur within habitat protection areas of nesting southeastern American kestrels due to their proximity to potential nest sites. Kestrels were observed during the 2020 species-specific survey in Basin 2-7 within pond sites Alt 3 and DRA 1A. Therefore, the listed species impact potential for these pond site alternatives was ranked "moderate." The remaining alternatives were ranked "low" for listed species impact potential based on field reviews. Besides gopher tortoises, no protected species, or evidence thereof, were observed in these sites. A summary of the findings is provided in Table 1.

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Table 7 - Summary of Environmental Impact Potential

Pond Site	Potential Wetland Impacts	Listed Species and Habitat Impact Potential†
2-5, Alt 1	No	Moderate
2-5, Alt 2	No	Moderate
2-5, Alt 3	No	Low
2-5, Alt 4	No	Moderate
DRA-E	No	Low
2-6, Alt 1	No	Low
2-6, Alt 2	No	Low
2-6, Alt 3	No	Low
2-7, Alt 1	No	Low
2-7, Alt 2	No	Low
2-7, Alt 3	No	Moderate
DRA 1A	No	Moderate
†Impacts may be avoided during design phase.		

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Hazardous Materials

A Contamination Screening Evaluation Report (Ponds) dated September 14, 2020 was prepared by Tierra Inc. to identify potential contamination information and hazardous materials risk ratings for each alternative pond site. The Contamination Screening Report and the CSER Addendum for Knoll Road are included in **Appendix H**.

The FDOT hazardous materials rating system was used in this report. The ratings include **NONE, LOW, MEDIUM**, and **HIGH**. The ratings are generally defined as follows:

> **NONE** – After a review of the available information on the property and a review of the conceptual or design plans indicates there is no potential contamination impact to the project. It is possible that contaminants have been handled on the property. However, findings from the Level I evaluation indicate that contamination impacts are not expected.
>
> **LOW** – A review of available information indicates that past or current activities on the property have an ongoing contamination issue; the site has a hazardous waste generator identification (ID) number, or the site stores, handles, or manufactures hazardous materials. However, based on the review of conceptual or design plans and/or findings from the Level I evaluation, it is not likely that there would be any contamination impacts to the project.
>
> **MEDIUM** - After a review of the conceptual or design plans and findings from a Level I evaluation, a potential contamination impact to the project has been identified. If there is insufficient information (such as regulatory records or site historical documents) to make a determination as to the potential for contamination impact, and there is reasonable suspicion that contamination may exist, the property should be rated at least as a "Medium." Properties used historically as gasoline stations and which have not been evaluated or assessed by regulatory agencies, sites with abandoned in place underground petroleum storage tanks or currently operating gasoline stations should receive this rating.
>
> **HIGH** - After a review of the available information and conceptual or design plans, there is appropriate analytical data that shows contamination will substantially impact construction activities, have implications to ROW acquisition or have other potential transfer of contamination related liability to the FDOT.

Most of the pond site alternatives studied were assigned a risk rating of **LOW** or **NO** contamination. Pond 2-6, Alt. 3 was assigned a **MEDIUM** risk rating based on a shooting range onsite. *Table 7* below presents a summary of the risk ratings assigned to each pond alternative.

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Table 8 - Pond Alternative Risk Rating Summary

Basin	Pond Site	Risk Rating	Notes
2-5	Alt. 1	Low	Woods, overgrown field, residences along Shady Knoll Place
	Alt. 2	Low	Woods
	Alt. 3	Low	Open field, woods
	Alt. 4	No	Overgrown field, woods, existing retention pond
	DRA-E	Low	Woods, residence
2-6	Alt. 1	Low	Open soil excavations with soil stockpiles throughout; offsite, adjoining east is an inactive limerock mine
	Alt. 2	Low	Woods and one residence
	Alt. 3	Medium	Open field, woods, shooting range in northeast area
2-7	Alt. 1	Low	Woods, two empty 55-gallon drums in east central area; no contamination concerns noted
	Alt. 2	Low	Woods, overgrown field
	Alt. 3	Low	Inactive open pit sand mine
Offsite	DRA-1A	Low	Inactive open pit sand mine

Cultural Resource Assessment

Janus Research performed a cultural resource assessment for each alternative pond site for Suncoast Parkway 2, Phase 2. The complete report is enclosed in Appendix I.

Two previously recorded archaeological sites are located within the current archaeological area of potential effect (APE). No newly or previously recorded historic resources were identified within the historic APE.

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STORMWATER PONDS

Pond Sizing and Location Considerations

Pond site alternative locations were chosen for analysis based on the proposed basin boundaries, the existing topography and land uses, and access to parcels previously acquired by FTE. Optimization of the earthwork requirements and utilization of FDOT-owned parcels were significant considerations when determining preferred pond alternative sites and dimensions. Ponds were sized based on the criteria outlined in previous sections for the ultimate, 8-lane configuration.

FTE has acquired several parcels as part of advanced acquisition of the project corridor. These FDOT-owned parcels were analyzed for pond sites wherever possible. A summary of the FDOT-owned parcels is included in the following table.

Table 9 - Summary of FDOT-Owned Parcels

Citrus County Property Appraiser Parcel ID	Adv. Parcel Number	Pond Site	Location	Alt Key #
18E18S320010 0020	100	2-5, Alt. 1	W. Shady Knoll Pl.	1988748
18E18S320010 0190	103	2-5, Alt. 1	W. Shady Knoll Pl.	3372652
18E18S29 1A000 0070	107	2-6, Alt. 2	N. Jali Pt.	2954663
18E18S29 4B000 0050	110	2-7, Alt. 1	W. Ziggy St.	1492921
18E18S29 4B000 0070	112	2-7, Alt. 1	W. Ziggy St.	1492939
18E18S320010 0050	231	2-5, Alt. 1	W. Shady Knoll Pl.	1988829
18E18S320010 0240	158	2-5, Alt. 4	W. Gulf to Lake Hwy and W. Shady Knoll Pl.	3447184
18E18S320010 0260	159	2-5, Alt. 1	W. Shady Knoll Pl.	1495814
18E18S29 4B000 0080	196	N/A	W. Ziggy St.	1492947
18E18S32 3A000 0030	163	2-5, Alt. 1	W. Gulf to Lake Hwy and W. Shady Knoll Pl.	1495300
18E18S320010 0180	171	N/A	W. Shady Knoll Pl.	1989141
18E18S320010 0170	172	N/A	W. Shady Knoll Pl.	1989116
18E18S320010 0220	167	2-5, Alt. 1	W. Shady Knoll Pl.	1953111
18E18S30 13100	201/202	2-7, Alt. 3 DRA-1A	W. Norvell Bryant Hwy	3506942

The existing topography and soil composition of the project corridor was evaluated to determine pond sites and sizes that would provide suitable fill to aid in the earthwork balance for the proposed corridor.

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Minimizing fill required to construct the ponds was a consideration in determining the preferred pond alternative for each basin.

Coordination with FDOT District 7 and Citrus County is ongoing and joint use opportunities with FDOT D7 and Citrus County are being explored.

Analysis Performed

Complete management of the runoff for the entire Right of Way (ROW) is the principal objective of the stormwater management facilities for this project. As previously described, the ponds were sized based on the treatment and attenuation criteria outlined previously for the ultimate 8-lane typical section.

The pre-development condition was reviewed, and existing basin information analyzed. Analysis of the existing conditions is included in **Appendix B**. Low points in the existing basins were identified and the elevations and locations are noted on the Pre-Development Basin Maps (**Appendix B**). Where these low areas were impacted by the proposed project corridor, compensation was provided for the impacted volume in the proposed basin requirements.

Due to the significant potential for infiltration into the underlying soils at each pond location, a more comprehensive hydrologic analysis was performed using the Interconnected Channel and Pond Routing Model (ICPR) (v. 4.05.01). The analysis was based on existing models provided by the SWFWMD which were modified to include the proposed improvements.

The SWFWMD 100-year 24-hour storm was determined to produce the highest pond stages. The required storage volume was calculated as the difference between the SWFWMD 100-year 24-hour storm cumulative basin runoff volume and the cumulative infiltration volume at the time of maximum cumulative basin runoff. The results of the ICPR simulations are included in **Appendix C**.

Seasonal High Water Level

The seasonal high water level (SHWL) is critical in the design, operation, and recovery of any stormwater retention system. Tierra, Inc. completed geotechnical investigations to assist with the estimation of seasonal high water levels (SHWL) at each alternative pond site. The geotechnical analysis involved the collection of soil borings at each pond site to determine the elevation of the ground water table as well as the underlying soil types. The results of the soil borings are included in **Appendix D.**

Although the soil borings did not encounter the permanent groundwater table across the majority of the alternative pond sites, the soil borings indicate that sub-surface clay layers were present at several pond locations. The clay layers have low permeability and could cause a "perched" water table during and immediately following periods of heavy rainfall and may impact the functionality of the pond during rainfall events.

Pond Treatment and Storage Volumes

Using the design criteria outlined in *Table 3*, each pond was sized to provide the following treatment and storage volumes:

- Stormwater treatment volume will be in accordance with SWFWMD requirements.

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- Stormwater storage volume will be sufficient to allow all on-site runoff and off-site runoff from impacted low areas to be captured.

Pond treatment volume calculations for each basin are included in **Appendix C**.

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RESULTS

Basis of Pond Evaluation

An alternative comparison analysis was developed for each pond site to determine the recommended pond for each basin. Each alternative was evaluated based on the following factors:

- Soils and Land Use
- Hazardous Materials
- Environmental and Cultural Impacts (specifically potential impacts to listed species and habitat)
- Constructability
- Economics
- Functionality
- Proximity to low points in road profile
- Infiltration potential

The outcomes of this assessment are summarized in the pond site evaluation matrix presented in **Appendix E.** A summary of the preferred alternatives is described in *Table 9 – Summary of Recommended Pond Alternatives.*

Table 10 - Summary of Recommended Pond Alternatives

Basin	Pond Alternative	Total Estimated Cost	Notes
2-5	Alt. 1	$898,633	Basin Stormwater Management and Historic Storage Compensation
	Alt. 4	$204,569	Ramp Stormwater Management
	DRA-E	$1,326,836	Compensation for impacted existing stormwater facility (Infield ponds)
2-6	Alt. 1	$521,907	Historic Storage Compensation
	Alt. 3	$945,799	Basin Stormwater Management
2-7	Alt. 1	$434,669	Basin Stormwater Management
	Alt. 2	$364,347	Ramp Stormwater Management
	Alt. 3	$479,363	Historic Storage Compensation
Offsite	DRA-1A	$76,094	Relocation of existing stormwater management facility due to Knoll Road Realignment

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CONCLUSION

Basin 2-5

The recommended pond sites for Basin 2-5 are Alt. 1, Alt. 4 and DRA-E. Pond 2-5, Alt. 1 is located within a group of FDOT-owned parcels adjacent to W. Shady Knoll Pl. on the left-hand side of the proposed SR 44/SR 589 interchange. This pond site was selected due to the suitability of existing soils for pond recovery and roadway fill, low contamination risk, and low cultural impact potential. Additionally, this pond site is primarily located within FDOT-owned parcels and would require minimal additional ROW takes. Pond 2-5, Alt. 4 is provided to capture runoff from the proposed ramps. Pond 2-5, Alt. 4 is an infield pond and would not require any additional ROW acquisition. Alternatives 2 and 3 would require additional ROW acquisition costs as well as requiring soil over-excavation for pond recovery. Pond DRA-E was selected to replace the existing SR 44 treatment pond impacted by the proposed alignment and interchange.

Basin 2-6

The preferred pond sites for Basin 2-6 are Alternative 1 and Alternative 3. The site for Alt. 3 is located on the right-hand side of the ROW and includes an FDOT-owned parcel. Additionally, the soils located within this site are suitable for pond recovery and roadway fill. This site has low contamination risk, low environmental impact risk, and low cultural impact potential. Alt. 3 is also sized to meet the treatment and attenuation requirements of the entire basin. Alternative 2 is not large enough to meet the basin requirements. Pond 2-6, Alt. 1 can be utilized as historic basin compensation as the soils on this site are not suitable for the pond recovery requirements.

Basin 2-7

All three of the pond site alternatives for Basin 2-7 are recommended to accommodate separate drainage needs of the basin. Pond 2-7, Alt. 1 was selected as the primary drainage facility due to its proximity to the roadway low point and soil suitability. The site is located on the right-hand side of the proposed ROW near W. Ziggy St. The soils on this site are suitable for pond recovery and roadway fill and could be used to balance the earthwork requirements of the proposed roadway. Pond 2-7, Alt. 2 was selected to be utilized for the stormwater management of the ramps associated with the proposed interchange. Pond 2-7, Alt. 3 is located within an FDOT-owned parcel consisting of an existing open cut sand mine. This site was selected for historical basin compensation due to the excavated nature of the site. Minor earthwork would be required to modify the existing excavation into a useable compensation pond. These sites have low contamination risk, low environmental impact risk, and low cultural impact potential.

Knoll Road Realignment

The realignment of Knoll Road will result in an existing pond being relocated within an FTE-owned parcel. This pond will be to accommodate the stormwater management needs of the existing landfill cells only. There are no additional ROW costs associated with this pond relocation. Additionally, the soils on this site are suitable for roadway fill and could be used to balance the earthwork requirements of the proposed roadway. The contamination risk rating of this site was determined to be Low. The treatment and attenuation requirements for the proposed roadway will be provided in linear swales adjacent to the proposed alignment.

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REFERENCES

Citrus County. (n.d.). Retrieved from Citrus County Land Development Code Website: https://www.citrusbocc.com/plandev/landdev/ldc/ldc.htm

Florida Department of Transportation. (Jan. 2020). *Drainage Design Guide.*

Florida Department of Transportation. (Jan. 2020). *Drainage Manual.*

Florida's Turnpike Enterprise. (Jan. 2020). *Turnpike Supplement to the FDOT Drainage Manual.*

Southwest Florida Water Management District. (2018). *Environmental Resource Permit Applicant's Handbook Vol. II.*

Southwest Florida Water Management District. (n.d.). Retrieved from Southwest Florida Water Managment District website: https://www.swfwmd.state.fl.us/

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APPENDIX A

Exhibits

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STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

LOCATION MAP

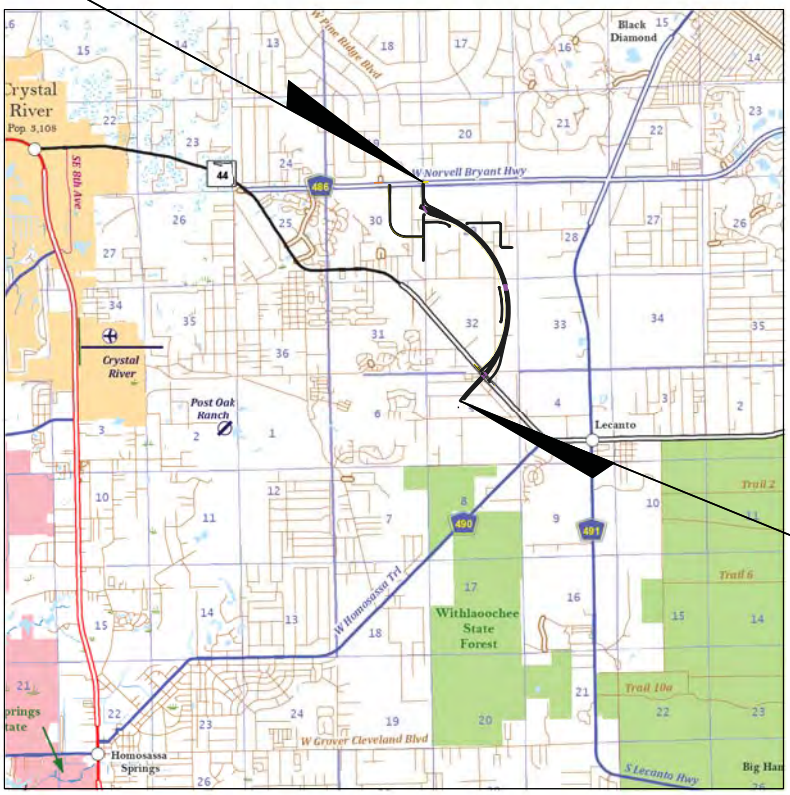
FINANCIAL PROJECT ID 442764-1-52-01
SR 589 (SUNCOAST PARKWAY 2)
FROM SR 44 TO CR 486

CITRUS COUNTY (02470)

END PROJECT
℄ SURVEY &
℄ CONST.
SR 589 (SUNCOAST)
STA. 4385+00

R-17-E
R-18-E

T-18-S
T-19-S



T-18-S
T-19-S

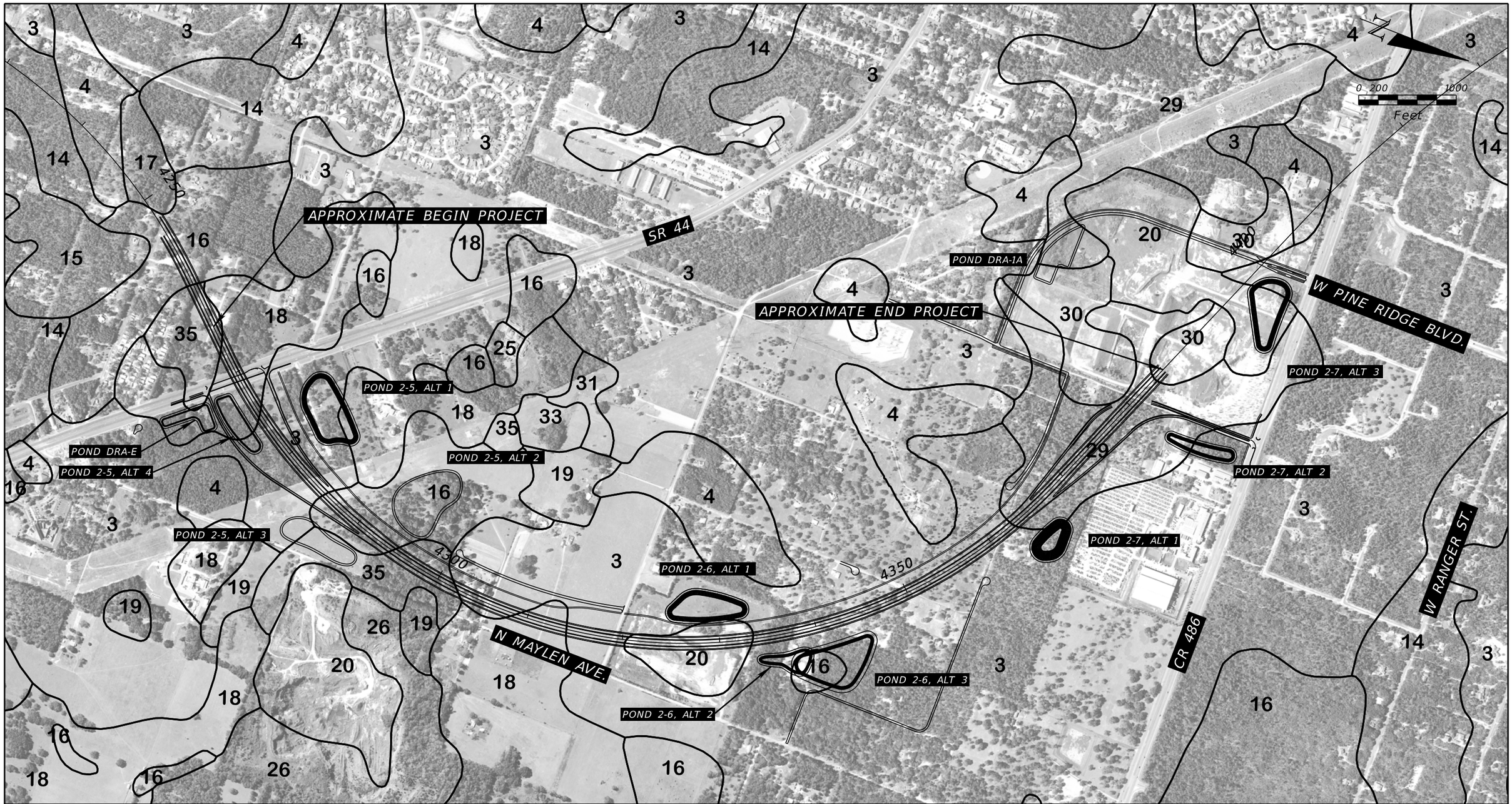
R-17-E
R-18-E

BEGIN PROJECT
℄ SURVEY &
℄ CONST.
SR 589 (SUNCOAST)
STA. 4252+26

N

FEBRUARY 2020
FLORIDA'S TURNPIKE ENTERPRISE

SHEET NO.
A-1



REFERENCE: USDA SOIL SURVEY OF CITRUS COUNTY, FLORIDA

TOWNSHIP:	18S	18S
RANGE:	18E	17E
SECTION:	29, 30, 32	12

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

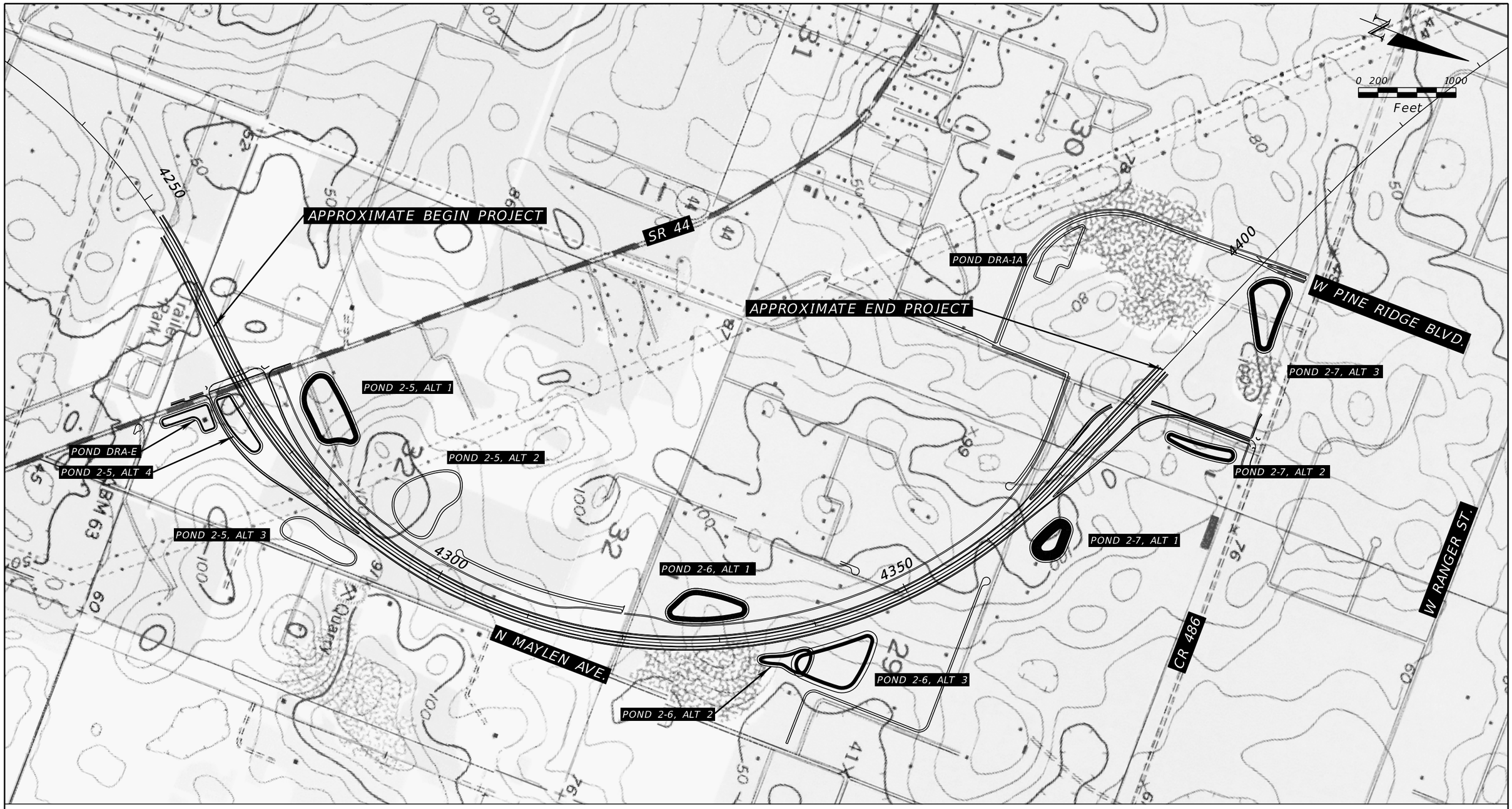
MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-32-01

USDA SOIL SURVEY MAP

SHEET NO.
A-2



REFERENCE: USGS QUADRANGLE MAP OF "CRYSTAL RIVER, FLORIDA" AND "HOMOSASSA, FLORIDA"

TOWNSHIP:	18S	18S
RANGE:	18E	17E
SECTION:	29, 30, 32	12

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-32-01

USGS QUADRANGLE MAP

SHEET NO.
A-3

bsawaska 9/23/2020 1:48:31 PM J:\6511\2018 Files\6511-18-108 Suncoast Pkwy 2\Microstation\USGS01.dgn

PROJECT CONTROLS

CONTEXT CLASSIFICATION

( ) C1 : NATURAL
( ) C2 : RURAL
( ) C2T : RURAL TOWN
( ) C3R : SUBURBAN RES.
( ) C3C : SUBURBAN COMM.
( ) C4 : URBAN GENERAL
( ) C5 : URBAN CENTER
( ) C6 : URBAN CORE
(X) N/A : L.A. FACILITY

FUNCTIONAL CLASSIFICATION

( ) INTERSTATE
(X) FREEWAY/EXPWY.
( ) PRINCIPAL ARTERIAL
( ) MINOR ARTERIAL
( ) MAJOR COLLECTOR
( ) MINOR COLLECTOR
( ) LOCAL

HIGHWAY SYSTEM

(X) NATIONAL HIGHWAY SYSTEM
(X) STRATEGIC INTERMODAL SYSTEM
(X) STATE HIGHWAY SYSTEM
( ) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

(X) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

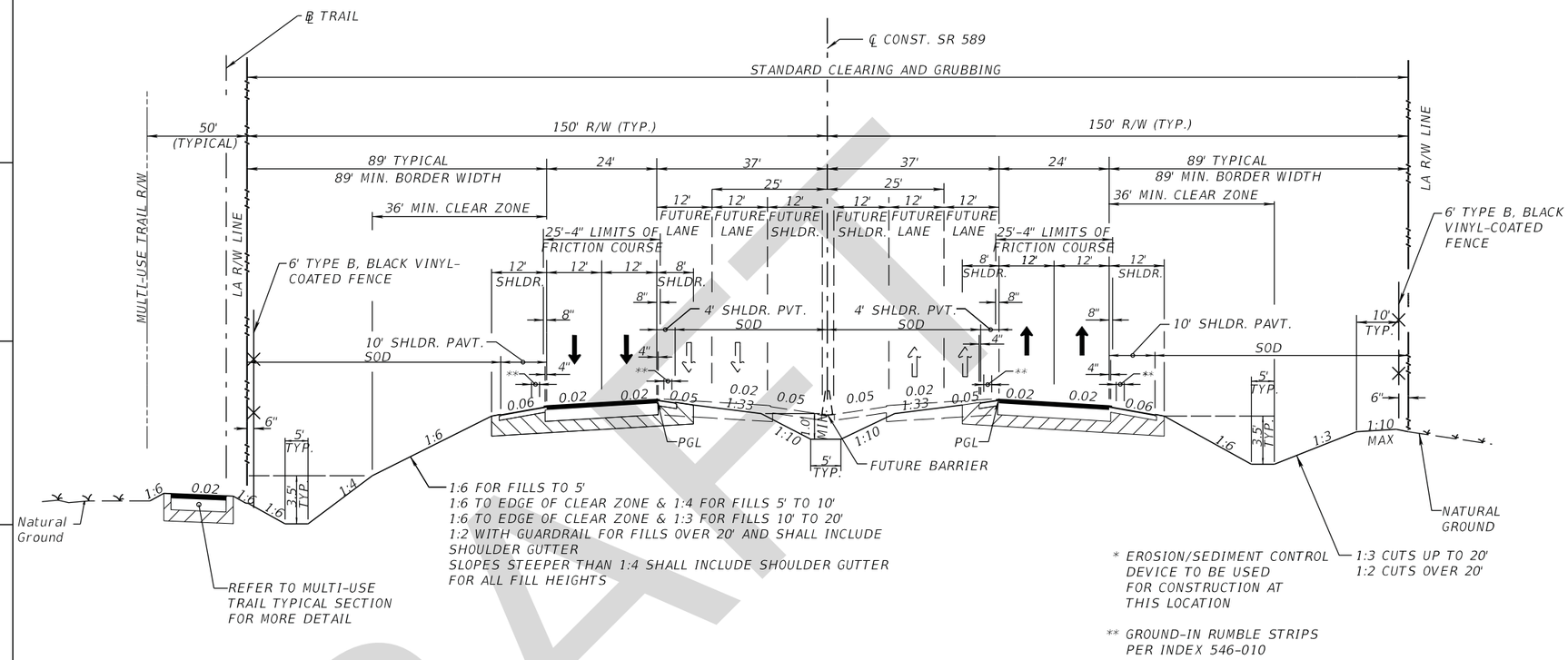
CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RESURFACING (LA FACILITIES)
( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

Border Width Variation

TYPICAL SECTION No. 1



TYPICAL SECTION NO. 1

SR 589 - SUNCOAST PARKWAY 2
STA. 4252+25.64 TO STA. 4269+32.19
STA. 4271+54.19 TO STA. 4317+63.62
STA. 4319+87.62 TO STA. 4347+50
STA. 4348+50 TO STA. 4378+39
STA. 4381+28 TO STA. 4385+00

TRAFFIC DATA

CURRENT YEAR = 2020 AADT = N/A
ESTIMATED OPENING YEAR = 2030 AADT = 6,000
ESTIMATED DESIGN YEAR = 2050 AADT = 8,300
K = 10.5% D = 55.0% T = 7.7% (24 HOUR) DHT = 4.0%
DESIGN SPEED = 70 MPH
POSTED SPEED = 70 MPH

FINANCIAL PROJECT ID	SHEET NO.
442764-1-52-01	A-4

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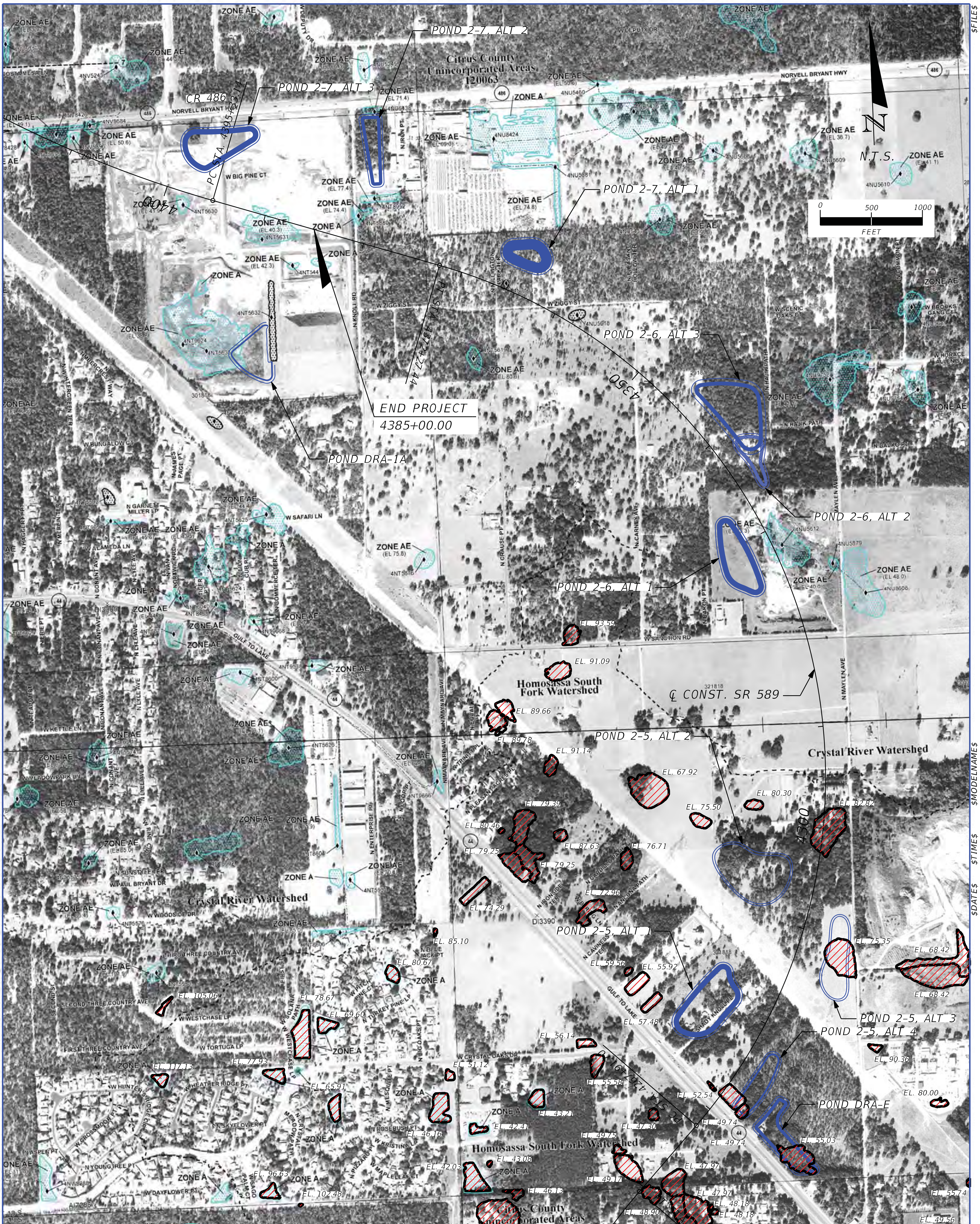
NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



WBQ DESIGN & ENGINEERING, INC.
CERTIFICATE OF AUTHORIZATION NO. 6796
201 N. Magnolia Ave.
Suite 200
Orlando, FL 32801
TROY W. VARGAS, P.E. LICENSE NO. 57621

SUNCOAST PARKWAY 2
FPID 442764-1-52-01
POND SITING REPORT

FEMA FLOODMAP EXHIBIT

EXHIBIT NO.
A-5

$FILE$ $MODELNAME$ $TIME$ $DATE$ $USER$

APPENDIX B

Pre-Development Drainage Maps and Calculations

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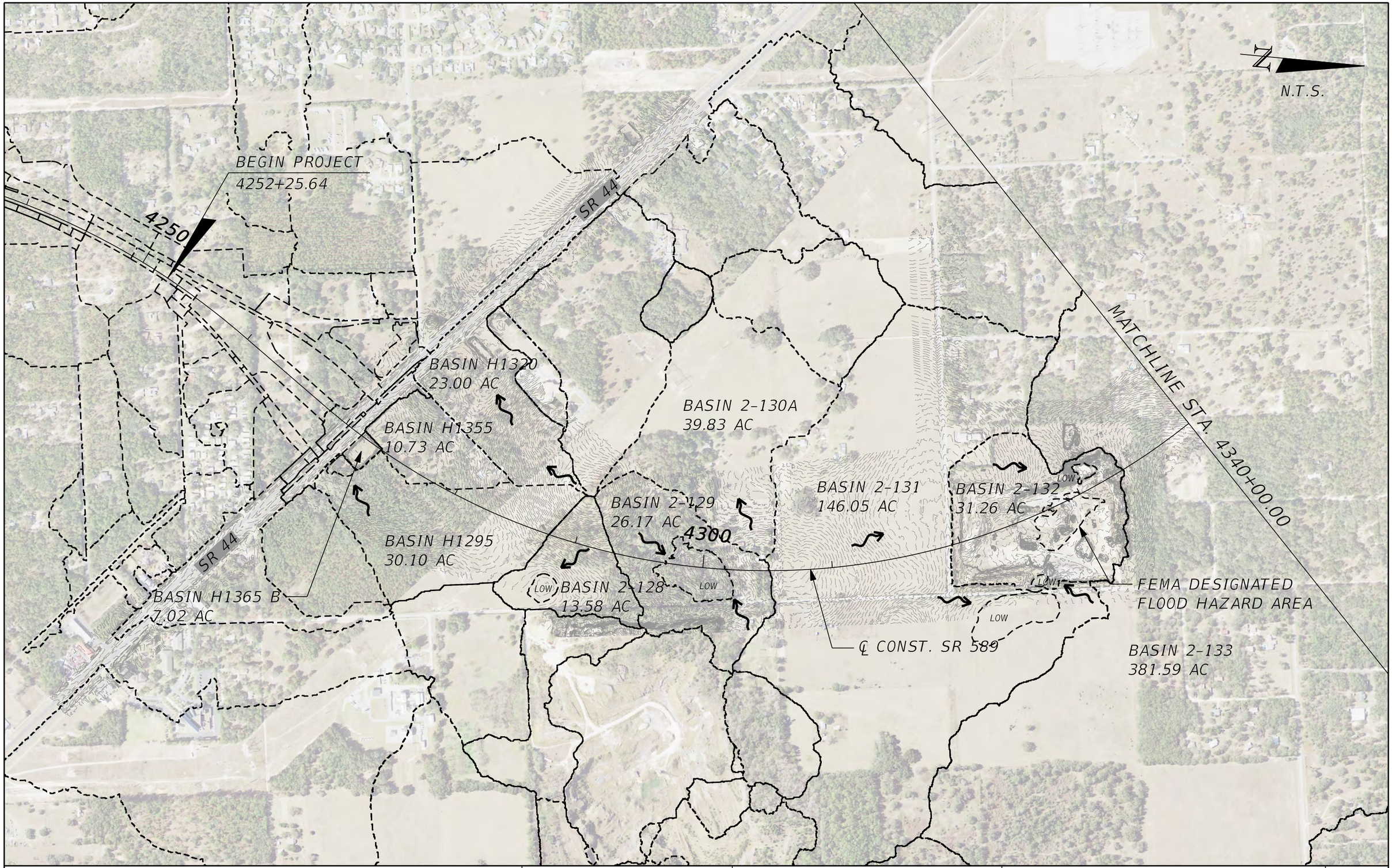


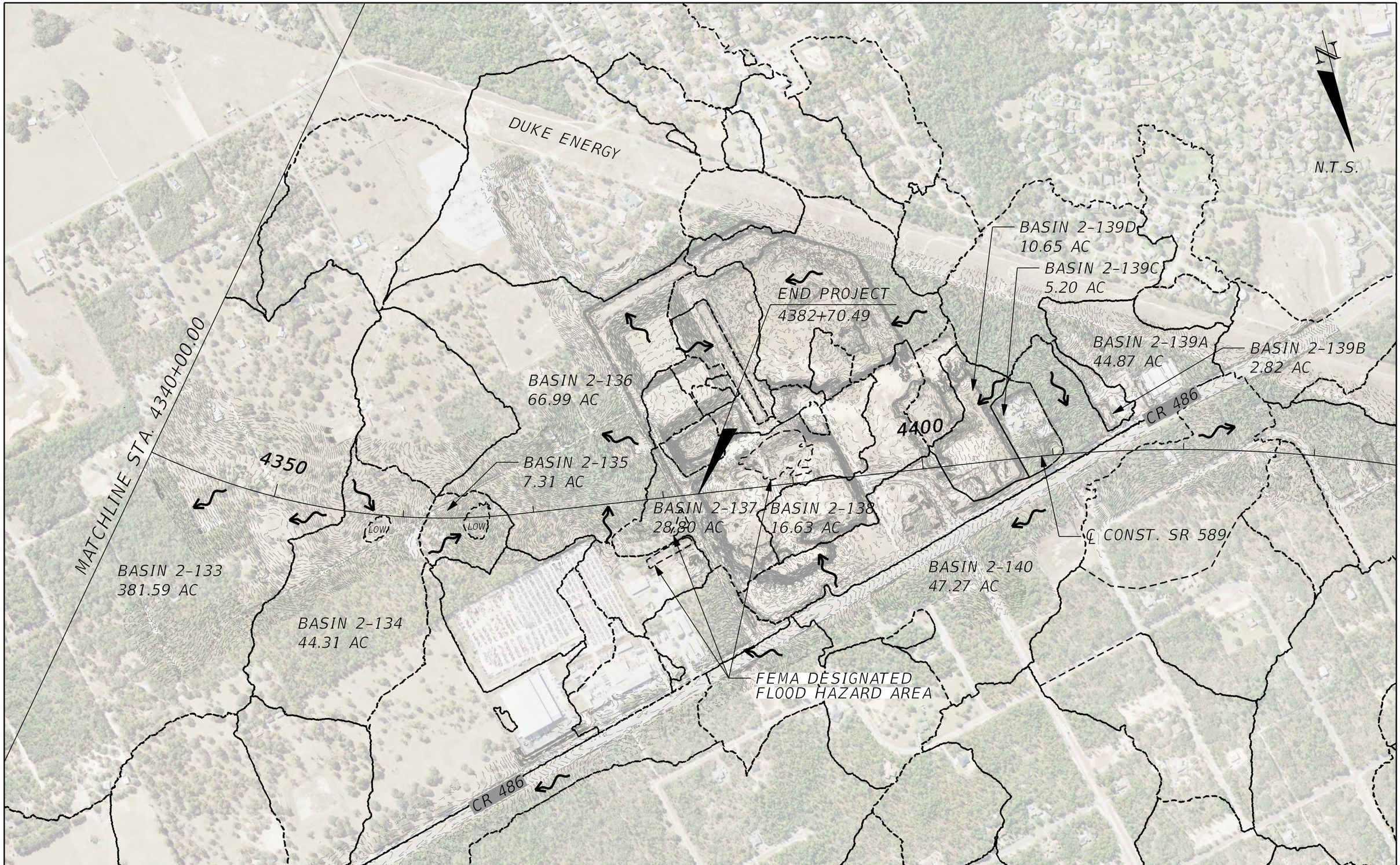
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

WBQ DESIGN & ENGINEERING, INC.
CERTIFICATE OF AUTHORIZATION NO. 6796
201 N. MAGNOLIA AVE.
SUITE 200
ORLANDO, FL 32801
TROY W. VARGAS, P.E. LICENSE NO. 57621

SUNCOAST PARKWAY 2
FPID 442764-1-52-01
POND SITING REPORT

EXISTING BASINS (1)

EXHIBIT NO.
B-1



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

WBQ DESIGN & ENGINEERING, INC.
CERTIFICATE OF AUTHORIZATION NO. 6796
201 N. MAGNOLIA AVE.
SUITE 200
ORLANDO, FL 32801
TROY W. VARGAS, P.E. LICENSE NO. 57621

SUNCOAST PARKWAY 2
FPID 442764-1-52-01
POND SITING REPORT

EXISTING BASINS (2)

EXHIBIT NO.
B-2

442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-H1295**
Receiving Node:	**N-H1295**
Basin Area:	**30.10 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A
16	Arredondo fine sand, 0 to 5 percent slopes	A
18	Kendrick fine sand, 0 to 5 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	9.03		9.03	352
Woods-Grass Comb. (Good)	A	32	21.07		21.07	674
Totals:			30.10	-	30.10	1026

Composite CN (exc. DCIA) =	**34**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Equations

Sheet Flow: $T_t = \dfrac{0.007(nL)^{0.8}}{(4.8)^{0.5}\,(S^{0.4}/100)}$ where: $L \leq 100$ ft.
S = slope (%)
n = Manning's Roughness Coeff.

Shallow Concentrated Flow: $T_t = \dfrac{L}{60V}$ where: Unpaved: $V=16.1345\,(S)^{0.5}$
Paved: $V=20.3282\,(S)^{0.5}$

Channel Flow: $T_t = \dfrac{L}{60V}$ where: V=2.5 fps (assumed)

Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.4	4.80	-	12.4
Shallow Conc. (Unpaved)	1540		2.70	2.65	9.7

Time of Conc. =	**22 Minutes**

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442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-H1355**
Receiving Node:	**N-H1355**
Basin Area:	**10.73 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
18	Kendrick fine sand, 0 to 5 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods-Grass Comb. (Good)	A	32	10.73		10.73	343
Totals:			10.73	-	10.73	343

Composite CN (exc. DCIA) =	**32**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.4	5.83	-	11.4
Shallow Conc. (Unpaved)	922		2.69	2.65	5.8

Time of Conc. = 17 Minutes

Basin:	**B-H1365_B**
Receiving Node:	**N-H1365_B**
Basin Area:	**7.02 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
18	Kendrick fine sand, 0 to 5 percent slopes	A
35	Sparr find sand, 0 to 5 percent slopes	A/D

Land Cover	Hydrologic	Curve Number	Pervious &	DCIA	Total Area	CN x Area
Open Space (Good)	A	39	5.97		5.97	233
Open Space (Good)	D	80	1.05		1.05	84
Totals:			7.02	-	7.02	317

Composite CN (exc. DCIA) =	**45**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.24	1.00	-	15.4
Shallow Conc. (Unpaved)	100		0.09	0.48	3.4

Time of Conc. = 19 Minutes

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442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-H1320**
Receiving Node:	**N-H1320**
Basin Area:	**23.00 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
18	Kendrick fine sand, 0 to 5 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods-Grass Comb. (Good)	A	32	23.00		23.00	736
Totals:			23.00	-	23.00	736

Composite CN (exc. DCIA) =	**32**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.4	3.25	-	14.4
Shallow Conc. (Unpaved)	1017		4.80	3.53	4.8

Time of Conc. = 19 Minutes

Basin:	**B-2-128**
Receiving Node:	**N-2-128**
Basin Area:	**13.58 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
16	Arredondo fine sand, 0 to 5 percent slopes	A
35	Sparr find sand, 0 to 5 percent slopes	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	9.50		9.50	371
Open Space (Good)	D	80	4.07		4.07	326
Totals:			13.58	-	13.58	696

Composite CN (exc. DCIA) =	**51**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.4	3.00	-	14.9
Shallow Conc. (Unpaved)	645		5.86	3.91	2.8

Time of Conc. = 18 Minutes

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442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-2-129**
Receiving Node:	**N-2-129**
Basin Area:	**26.17 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
16	Arredondo fine sand, 0 to 5 percent slopes	A
3	Candler fine sand, 0 to 5 percent slopes	A
35	Sparr find sand, 0 to 5 percent slopes	A/D
19	Kendrick fine sand, 5 to 8 percent slopes	B
18	Kendrick fine sand, 0 to 5 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods-Grass Comb. (Good)	A	32	15.70		15.70	503
Wetlands	D	98	2.62		2.62	257
Woods-Grass Comb. (Good)	D	79	5.23		5.23	414
Woods-Grass Comb. (Good)	B	58	2.62		2.62	152
Totals:			26.17	-	26.17	1324

Composite CN (exc. DCIA) =	**51**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.4	3.11	-	14.7
Shallow Conc. (Unpaved)	920		3.79	3.14	4.9

Time of Conc. = 20 Minutes

Basin:	**B-2-130A**
Receiving Node:	**N-2-130A**
Basin Area:	**39.83 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
16	Arredondo fine sand, 0 to 5 percent slopes	A
3	Candler fine sand, 0 to 5 percent slopes	A
35	Sparr find sand, 0 to 5 percent slopes	A/D
33	Micanopy loamy fine sand, 2 to 5 percent slopes	C
19	Kendrick fine sand, 5 to 8 percent slopes	B

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods-Grass Comb. (Good)	A	32	17.92		17.92	574
Open Space (Good)	B	61	9.96		9.96	607
Woods-Grass Comb. (Good)	C	72	3.98		3.98	287
Open Space (Good)	D	80	7.97		7.97	637
		-			-	-
Totals:			39.83	-	39.83	2105

Composite CN (exc. DCIA) =	**53**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.4	0.50	-	30.5
Shallow Conc. (Unpaved)	1170		3.20	2.89	6.8

Time of Conc. = 37 Minutes

DRAFT

442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-2-131**
Receiving Node:	**N-2-131**
Basin Area:	**146.05 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
19	Kendrick fine sand, 5 to 8 percent slopes	B
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A
18	Kendrick fine sand, 0 to 5 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	124.14		124.14	4841
Woods-Grass Comb. (Good)	B	58	21.91		21.91	1271
Totals:			146.05	-	146.05	6112

Composite CN (exc. DCIA) =	**42**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.24	2.08	-	11.5
Shallow Conc. (Unpaved)	2180		2.13	2.35	15.4

Time of Conc. = 27 Minutes

Basin:	**B-2-132**
Receiving Node:	**N-2-132**
Basin Area:	**31.26 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
20	Pits	N/A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	15.63		15.63	609
Open Space (Fair)	N/A	98	15.63		15.63	1532
Totals:			31.26	-	31.26	2141

Composite CN (exc. DCIA) =	**69**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.15	2.13	-	7.8
Shallow Conc. (Unpaved)	990		3.26	2.91	5.7

Time of Conc. = 13 Minutes

DRAFT

442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-2-133**
Receiving Node:	**N-2-133**
Basin Area:	**381.59 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A
16	Arredondo fine sand, 0 to 5 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods-Grass Comb. (Good)	A	32	381.59		381.59	12211
Totals:			381.59	-	381.59	12211

Composite CN (exc. DCIA) =	**32**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.4	2.00	-	17.5
Shallow Conc. (Unpaved)	4335		1.00	1.61	44.8

Time of Conc. = 62 Minutes

Basin:	**B-2-134**
Receiving Node:	**N-2-134**
Basin Area:	**44.31 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods-Grass Comb. (Good)	A	32	44.31		44.31	1418
Totals:			44.31	-	44.31	1418

Composite CN (exc. DCIA) =	**32**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.4	2.89	-	15.1
Shallow Conc. (Unpaved)	1330		3.00	2.79	7.9

Time of Conc. = 23 Minutes

DRAFT

442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-2-135**
Receiving Node:	**N-2-135**
Basin Area:	**7.31 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
4	Candler fine sand, 5 to 8 percent slopes	A
29	Astatula fine sand, 0 to 5 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods-Grass Comb. (Good)	A	32	7.31		7.31	234
Totals:			7.31	-	7.31	234

Composite CN (exc. DCIA) =	**32**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.4	3.16	-	14.6
Shallow Conc. (Unpaved)	347		3.88	3.18	1.8

Time of Conc. = 16 Minutes

Basin:	**B-2-136**
Receiving Node:	**N-2-136**
Basin Area:	**66.99 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
29	Astatula fine sand, 0 to 5 percent slopes	A
30	Astatula fine sand, 5 to 8 percent slopes	A
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods-Grass Comb. (Good)	A	32	66.99		66.99	2144
Totals:			66.99	-	66.99	2144

Composite CN (exc. DCIA) =	**32**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.2	2.50	-	9.2
Shallow Conc. (Unpaved)	1450		2.72	2.66	9.1

Time of Conc. = 18 Minutes

DRAFT

442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-2-137**
Receiving Node:	**N-2-137**
Basin Area:	**28.80 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
29	Astatula fine sand, 0 to 5 percent slopes	A
30	Astatula fine sand, 5 to 8 percent slopes	A
20	Pits	N/A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	5.76		5.76	225
Open Space (Good)	N/A	98	23.04		23.04	2258
Totals:			28.80	-	28.80	2482

Composite CN (exc. DCIA) =	**86**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.4	5.60	-	11.6
Shallow Conc. (Unpaved)	887		5.40	3.75	3.9

Time of Conc. = 16 Minutes

Basin:	**B-2-138**
Receiving Node:	**N-2-138**
Basin Area:	**16.63 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
20	Pits	N/A
29	Astatula fine sand, 0 to 5 percent slopes	A
30	Astatula fine sand, 5 to 8 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	14.96		14.96	584
Open Space (Good)	N/A	98	1.66		1.66	163
Totals:			16.63	-	16.63	747

Composite CN (exc. DCIA) =	**45**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.05	12.00	-	1.6
Shallow Conc. (Unpaved)	1243		4.30	3.35	6.2

Note: 10-minute Time of Concentration is used when calculated value is less.

Time of Conc. = 8 Minutes

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442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-2-139D**
Receiving Node:	**N-2-139D**
Basin Area:	**10.65 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
30	Astatula fine sand, 5 to 8 percent slopes	A
29	Astatula fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	10.65		10.65	415
Totals:			10.65	-	10.65	415

Composite CN (exc. DCIA) =	**39**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.24	3.32	-	9.5
Shallow Conc. (Unpaved)	995		2.45	2.53	6.6

Time of Conc. = 16 Minutes

Basin:	**B-2-139C**
Receiving Node:	**N-2-139C**
Basin Area:	**5.20 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Civic/Office/Commercial (75%	A	74	5.20		5.20	384
Totals:			5.20	-	5.20	384

Composite CN (exc. DCIA) =	**74**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.3	7.50	-	8.2
Shallow Conc. (Unpaved)	540		5.96	3.94	2.3

Time of Conc. = 10 Minutes

DRAFT

442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-2-139A**
Receiving Node:	**N-2-139A**
Basin Area:	**44.87 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
29	Astatula fine sand, 0 to 5 percent slopes	A
20	Pits	N/A
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	38.14		38.14	1487
Open Space (Good)	D	80	6.73		6.73	538
Totals:			44.87	-	44.87	2026

Composite CN (exc. DCIA) =	**45**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.2	2.00	-	10.1
Shallow Conc. (Unpaved)	2620		1.13	1.72	25.5

Time of Conc. = 36 Minutes

Basin:	**B-2-139B**
Receiving Node:	**N-2-139B**
Basin Area:	**2.82 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Civic/Office/Commercial (75%	A	74	0.30		0.30	22
Totals:			0.30	-	0.30	22

Composite CN (exc. DCIA) =	**74**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.3	2.40	-	12.9
Shallow Conc. (Unpaved)	558		5.64	3.83	2.4

Time of Conc. = 15 Minutes

DRAFT

442764-1 Suncoast Parkway Segment 2
Pre-Development Basin Hydrology Calculations

Date: 3/11/2020
By: HMT
Ck: JDV

Basin:	**B-2-140**
Receiving Node:	**N-2-140**
Basin Area:	**47.27 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
29	Astatula fine sand, 0 to 5 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods-Grass Comb. (Good)	A	32	47.27		47.27	1513
Totals:			47.27	-	47.27	1513

Composite CN (exc. DCIA) =	**32**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.011	0.13	-	3.0
Shallow Conc. (Unpaved)	1585		2.52	2.56	10.3

Time of Conc. = 13 Minutes

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APPENDIX C

Post-Development Drainage Maps and Calculations

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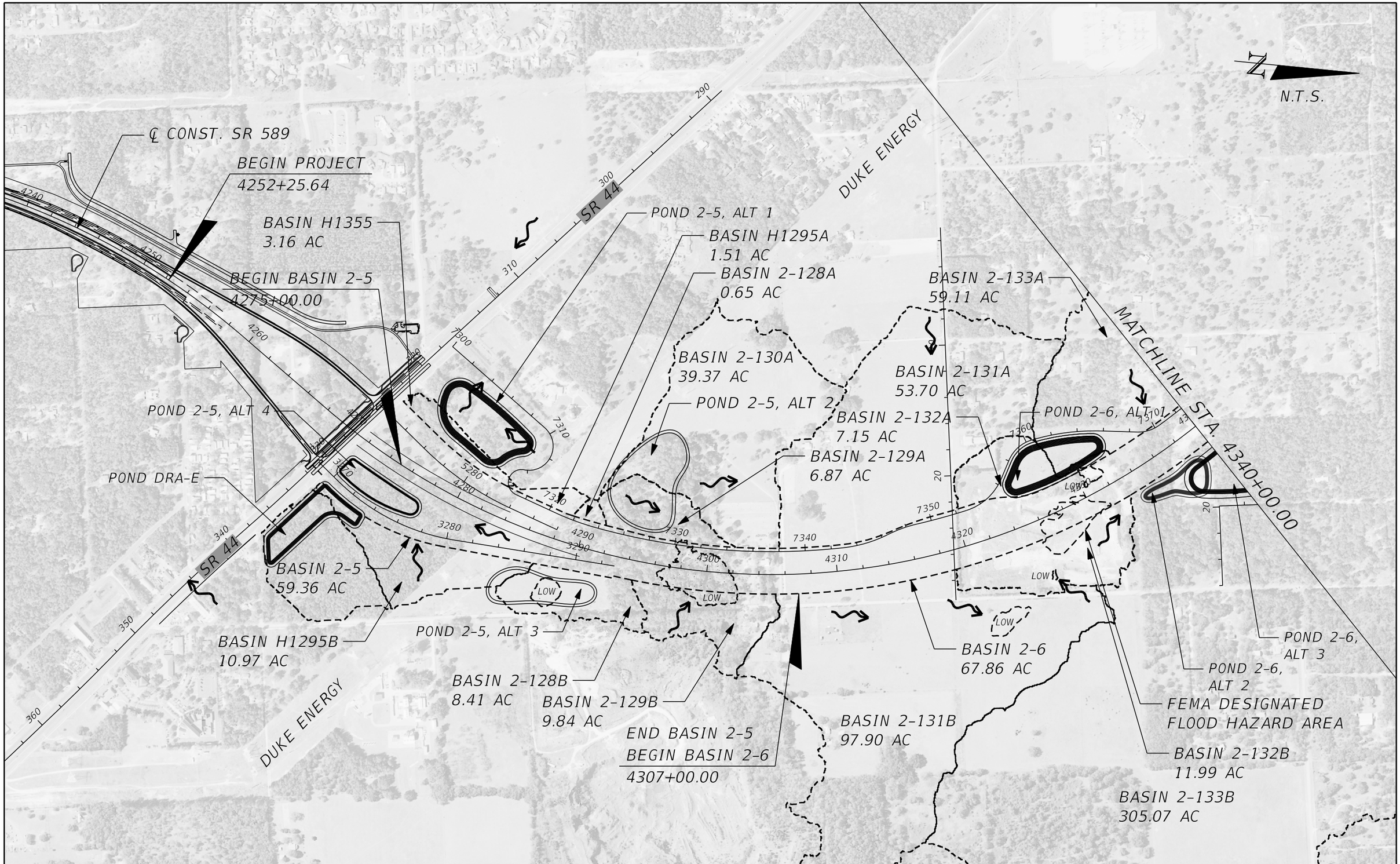


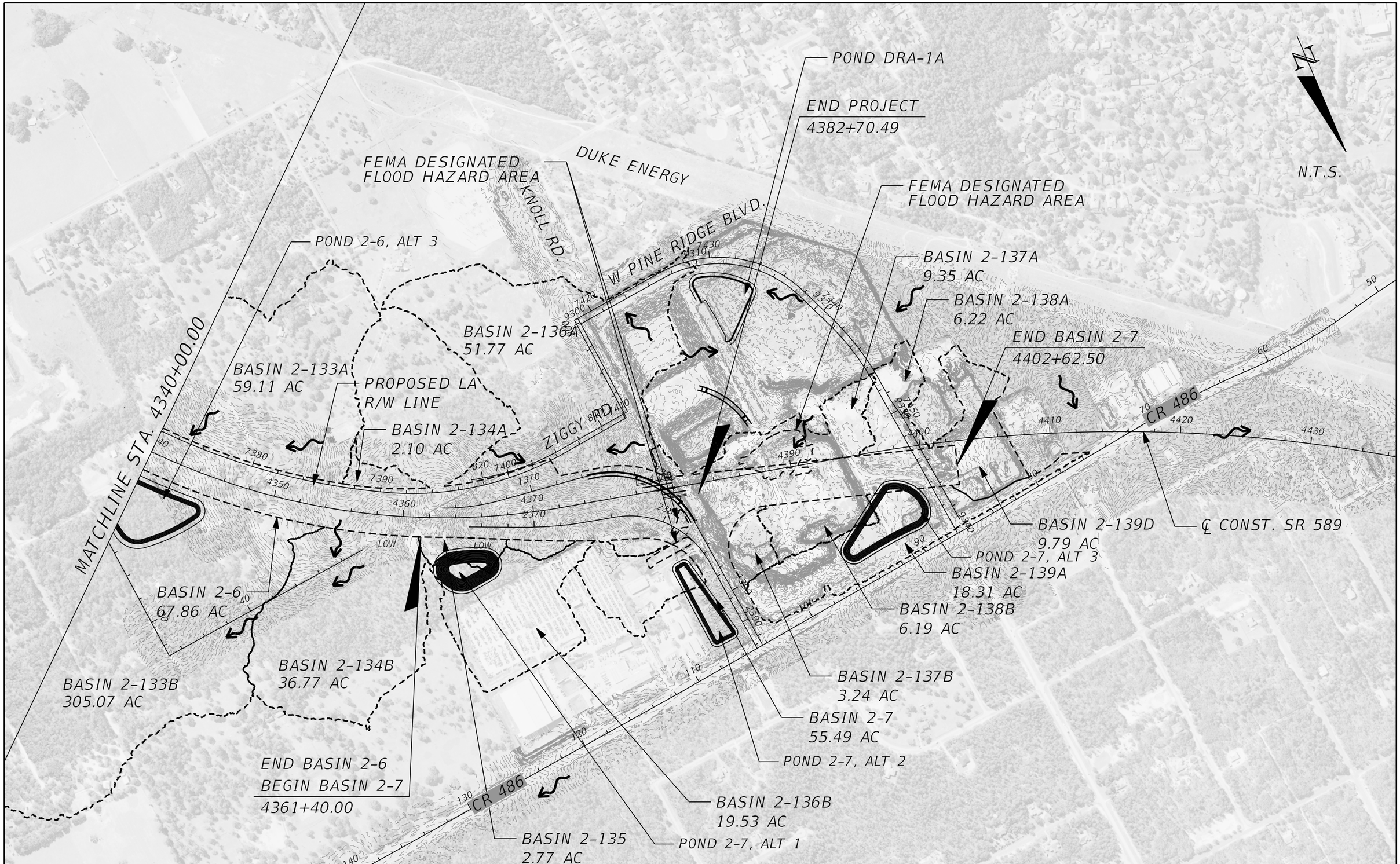
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

WBQ DESIGN & ENGINEERING, INC.
CERTIFICATE OF AUTHORIZATION NO. 6796
201 N. MAGNOLIA AVE.
SUITE 200
ORLANDO, FL 32801
TROY W. VARGAS, P.E. LICENSE NO. 57621

SUNCOAST PARKWAY 2
FPID 442764-1-52-01
POND SITING REPORT

PROPOSED BASINS (1)

EXHIBIT NO.
C-1



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

WBQ DESIGN & ENGINEERING, INC.
CERTIFICATE OF AUTHORIZATION NO. 6796
201 N. MAGNOLIA AVE.
SUITE 200
ORLANDO, FL 32801
TROY W. VARGAS, P.E. LICENSE NO. 57621

SUNCOAST PARKWAY 2
FPID 442764-1-52-01
POND SITING REPORT

PROPOSED BASINS (2)

EXHIBIT NO.
C-2

amoreno 10/12/2020 6:49:43 PM Exisiting Basins P:\19TUR_SUN2\44_486\44276415201\drainage\DRDTRD04.dgn

442764-1 Suncoast Parkway Segment 2
Post-Development Basin Hydrology Calculations

Date: 10/9/2020
By: HMT
Ck: JDV

Basin:	**B-2-5**
Receiving Node:	**Pond 2-5**
Basin Area:	**59.36 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A
16	Arredondo fine sand, 0 to 5 percent slopes	A
18	Kendrick fine sand, 0 to 5 percent slopes	A
19	Kendrick fine sand, 5 to 8 percent slopes	B
35	Sparr find sand, 0 to 5 percent slopes	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	43.83		43.83	1709
Pavement	N/A	98		15.53	15.53	0
Totals:			43.83	15.53	59.36	1709

Composite CN (exc. DCIA) =	**39**
Composite DCIA =	**26%**

Time of Concentration (T_c) Calculations

Equations

Sheet Flow: $T_t = \dfrac{0.007(nL)^{0.8}}{(4.8)^{0.5}\,(S^{0.4}/100)}$ where: $L \leq 100$ ft.; S = slope (%); n = Manning's Roughness Coeff.

Shallow Concentrated Flow: $T_t = \dfrac{L}{60V}$ where: Unpaved: $V=16.1345\,(S)^{0.5}$; Paved: $V=20.3282\,(S)^{0.5}$

Channel Flow: $T_t = \dfrac{L}{60V}$ where: V=2.5 fps (assumed)

Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.011	1.00	-	1.3
Channel/Pipe Flow	2200			2.50	14.7

Time of Conc. =	**16 Minutes**

DRAFT

442764-1 Suncoast Parkway Segment 2
Post-Development Basin Hydrology Calculations

Date: 10/9/2020
By: HMT
Ck: JDV

Basin:	**B-2-6**
Receiving Node:	**Pond 2-6**
Basin Area:	**67.86 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A
16	Arredondo fine sand, 0 to 5 percent slopes	A
18	Kendrick fine sand, 0 to 5 percent slopes	A
19	Kendrick fine sand, 5 to 8 percent slopes	B
20	Pits	N/A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	48.59		48.59	1895
Pavement	N/A	98		19.27	19.27	0
Totals:			48.59	19.27	67.86	1895

Composite CN (exc. DCIA) =	**39**
Composite DCIA =	**28%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.011	1.00	-	1.3
Channel/Pipe Flow	2000			2.50	13.3

Time of Conc. = 15 Minutes

DRAFT

442764-1 Suncoast Parkway Segment 2
Post-Development Basin Hydrology Calculations

Date: 10/9/2020
By: HMT
Ck: JDV

Basin:	**B-2-7**
Receiving Node:	**Pond 2-7**
Basin Area:	**55.49 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
3	Candler fine sand, 0 to 5 percent slopes	A
4	Candler fine sand, 5 to 8 percent slopes	A
20	Pits	N/A
29	Astatula fine sand, 0 to 5 percent slopes	A
30	Astatula fine sand, 5 to 8 percent slopes	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	A	39	43.57		43.57	1699
Pavement	N/A	98		11.92	11.92	0
Totals:			43.57	11.92	55.49	1699

Composite CN (exc. DCIA) =	**39**
Composite DCIA =	**21%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (T_t) (min)
Sheet Flow	100	0.011	1.00	-	1.3
Channel/Pipe Flow	1500			2.50	10.0

Time of Conc. =	**11 Minutes**

DRAFT

Historic Storage Impacts

PROJECT: Suncoast 2, Section 2 PREPARED: DH DATE: 3/11/2020

LOCATION: CITRUS COUNTY, FLORIDA CHECKED: HT DATE:

Basin H1295			
Elevation	Area (ac)	Volume (ac-ft)	
48	0.01	0.00	Basin 2-5
49	0.20	0.11	
50	0.32	0.37	
51	0.41	0.73	
52	0.48	1.17	

Basin 2-128			
Elevation	Area (ac)	Volume (ac-ft)	
72	0.06	0.00	Basin 2-5
73	0.37	0.21	
74	0.80	0.80	

Basin 2-129			
Elevation	Area (ac)	Volume (ac-ft)	
77	0.11	0.00	Basin 2-5
78	0.31	0.21	
79	0.66	0.70	
80	1.07	1.56	
81	1.48	2.83	
82	1.93	4.54	
83	2.46	6.74	
84	3.21	9.57	
85	4.04	13.51	

Total Impacts for Basin 2-5: 15.48 ac-ft.

Basin 2-132			
Elevation	Area (ac)	Volume (ac-ft)	
44	0.08	0.00	Basin 2-6
45	0.13	0.11	
46	0.19	0.27	
47	0.25	0.49	
48	0.30	0.76	
49	0.34	1.08	
50	0.37	1.44	

Basin 2-134			
Elevation	Area (ac)	Volume (ac-ft)	
93	0.34	0.00	Basin 2-6
94	0.37	0.36	

Total Impacts for Basin 2-6: 1.79 ac-ft.

Basin 2-135			
Elevation	Area (ac)	Volume (ac-ft)	
88	0.06	0.00	Basin 2-7
89	0.29	0.17	
90	0.59	0.61	
91	0.90	1.36	

Total Impacts for Basin 2-7: 1.36 ac-ft.

DRAFT

Volume Calculations (Dry Detention - Basin 2-5)

PROJECT: Suncoast 2, Section 2 PREPARED: DH DATE: 10/12/2020

LOCATION: CITRUS COUNTY, FLORIDA CHECKED: HT DATE:

Required Treatment Volume					
Area (Ac)		Treatment Volume (Ac-ft)			Required Treatment Volume (Ac-ft)
		Citrus County	SWFWMD		
Total Contributing	Impervious	1/2" x Developed Area	1" x Total Area	0.5" x Total Area (Basin < 100 Ac)	
59.36	15.53	0.65	Not applicable	2.47	**2.47**

Required Attenutation Volume*				
Inflow Volume (ft^3)	Time (hours)	Infiltration Volume (ft^3)	Maximum Attentuation Volume (ft^3)	Maximum Attentuation Volume (Ac-ft)
1,099,771	23.95	354,351	745,420	**17.11**

*Based on SWFWMD 100yr/24hr

Pond Data (Pond 2-5, Alt. 1)			
Elevation	Area (ac)	Volume (ac-ft)	
66	4.23	0.00	Pond Bottom
67	4.44	4.34	
68	4.65	8.88	
69	4.86	13.64	
70	5.07	18.60	
71	5.29	23.78	
72	5.51	29.18	
73	5.74	34.81	
74	5.97	40.66	Max Peak Design Stage
75	6.20	46.75	Inside of Berm
76	7.17	53.43	Outside Top of Berm

Treatment Volume Elevation = 66.57 ft

Attenuation Volume Elevation = 69.77 ft

Pond Data (Pond 2-5, Alt. 3)			
Elevation	Area (ac)	Volume (ac-ft)	
66	2.39	0.00	Pond Bottom
67	2.59	2.49	
68	2.79	5.17	
69	2.99	8.06	
70	3.20	11.16	
71	3.41	14.46	
72	4.30	18.32	
		-	
		-	Max Peak Design Stage
		-	Inside of Berm
		-	Outside Top of Berm

Treatment Volume Elevation = 66.99 ft

Attenuation Volume Elevation = 71.69 ft

Pond Data (Pond 2-5, Alt. 2)			
Elevation	Area (ac)	Volume (ac-ft)	
66	5.50	0.00	Pond Bottom
67	5.73	5.61	
68	5.97	11.46	
69	6.22	17.56	
70	6.46	23.90	Max Peak Design Stage
71	6.72	30.49	Inside of Berm
72	7.77	37.73	Outside Top of Berm

Treatment Volume Elevation = 66.44 ft

Attenuation Volume Elevation = 68.93 ft

Pond Data (Pond 2-5, Alt. 4)			
Elevation	Area (ac)	Volume (ac-ft)	
48	0.74	0.00	Pond Bottom
49	0.85	0.80	
50	1.04	1.74	
51	1.20	2.86	
52	1.36	4.14	Max Peak Design Stage
53	1.52	5.58	Inside of Berm
54	2.21	7.45	Outside Top of Berm

Treatment Volume Elevation = 50.65 ft

Attenuation Volume Elevation = 62.12 ft

DRAFT

Pond Data (Pond DRA-E)			
Elevation	Area (ac)	Volume (ac-ft)	
48	2.39	0.00	Pond Bottom
49	2.62	2.51	
50	2.85	5.24	
51	3.08	8.21	
52	3.32	11.41	Max Peak Design Stage
53	3.58	14.86	Inside of Berm
54	4.56	18.93	Outside Top of Berm

Treatment Volume Elevation* = 48.99 ft

Attenuation Volume Elevation* = 53.55 ft

* Required Volumes from SR 44 Drainage Calculations (June 1993)

TV = 2.12 ac-ft

AV = 3.23 ac-ft

DRAFT

Volume Calculations (Dry Detention - Basin 2-6)

PROJECT: Suncoast 2, Section 2 PREPARED: DH DATE: 10/12/2020

LOCATION: CITRUS COUNTY, FLORIDA CHECKED: HT DATE:

Required Treatment Volume					
Area (Ac)		Treatment Volume (Ac-ft)			Required Treatment Volume (Ac-ft)
		Citrus County	SWFWMD		
Total Contributing	Impervious	1" x Developed Area	1" x Total Area	0.5" x Total Area (Basin < 100 Ac)	
67.86	19.27	1.61	Not applicable	2.83	**2.83**

Required Attenutation Volume*				
Inflow Volume (ft^3)	Time (hours)	Infiltration Volume (ft^3)	Maximum Attentuation Volume (ft^3)	Maximum Attentuation Volume (Ac-ft)
991,703	15.09	421,596	570,107	**13.09**

*Based on SWFWMD 100yr/24hr

Pond Data (Pond 2-6, Alt. 1)			
Elevation	Area (ac)	Volume (ac-ft)	
48	2.71	0.00	Pond Bottom
49	3.09	2.90	
50	3.48	6.19	
51	3.88	9.87	
52	4.09	13.85	
53	4.30	18.05	Max Peak Design Stage
54	4.51	22.45	Inside of Berm
55	5.41	27.41	Outside Top of Berm

Treatment Volume Elevation = 48.98 ft

Attenuation Volume Elevation = 51.81 ft

Pond Data (Pond 2-6, Alt. 3)			
Elevation	Area (ac)	Volume (ac-ft)	
48	4.98	0.00	Pond Bottom
49	5.21	5.10	
50	5.44	10.42	
51	5.67	15.98	
52	5.91	21.77	
53	6.15	27.80	Max Peak Design Stage
54	6.39	34.07	Inside of Berm
55	8.21	41.37	Outside Top of Berm

Treatment Volume Elevation = 48.55 ft

Attenuation Volume Elevation = 50.48 ft

Pond Data (Pond 2-6, Alt. 2)			
Elevation	Area (ac)	Volume (ac-ft)	
48	1.13	0.00	Pond Bottom
49	1.26	1.19	
50	1.40	2.52	
51	1.54	3.99	
52	1.69	5.60	Max Peak Design Stage
53	1.84	7.37	Inside of Berm
54	2.48	9.52	Outside Top of Berm

Treatment Volume Elevation = 50.21 ft

Attenuation Volume Elevation = 56.53 ft

DRAFT

Volume Calculations (Dry Detention - Basin 2-7)

PROJECT: Suncoast 2, Section 2 PREPARED: DH DATE: 10/12/2020

LOCATION: CITRUS COUNTY, FLORIDA CHECKED: HT DATE:

Required Treatment Volume					
Area (Ac)		Treatment Volume (Ac-ft)			Required Treatment Volume (Ac-ft)
		Citrus County	SWFWMD		
Total Contributing	Impervious	1" x Developed Area	1" x Total Area	0.5" x Total Area (Basin < 100 Ac)	
55.49	11.92	0.99	Not applicable	2.31	**2.31**

Required Attenutation Volume*				
Inflow Volume (ft^3)	Time (hours)	Infiltration Volume (ft^3)	Maximum Attentuation Volume (ft^3)	Maximum Attentuation Volume (Ac-ft)
697,022	14.86	278,669	418,353	**9.60**

*Based on SWFWMD 100yr/24hr

Pond Data (Pond 2-7, Alt. 1)			
Elevation	Area (ac)	Volume (ac-ft)	
62	1.51	0.00	Pond Bottom
63	1.63	1.57	
64	1.75	3.26	
65	1.87	5.07	
66	2.00	7.01	
67	2.13	9.07	
68	2.20	11.24	
69	2.40	13.54	
70	2.54	16.01	Max Peak Design Stage
71	2.68	18.62	Inside of Berm
72	3.30	21.61	Outside Top of Berm

Treatment Volume Elevation = 63.44 ft

Attenuation Volume Elevation = 67.29 ft

Pond Data (Pond 2-7, Alt. 3)			
Elevation	Area (ac)	Volume (ac-ft)	
44	2.95	0.00	Pond Bottom
45	3.14	3.05	
46	3.30	6.27	
47	3.52	9.68	
48	3.71	13.29	
49	3.91	17.10	
50	4.12	21.12	
51	4.32	25.34	
52	4.53	29.76	Max Peak Design Stage
53	4.78	34.42	Inside of Berm
54	5.64	39.63	Outside Top of Berm

Treatment Volume Elevation = 44.76 ft

Attenuation Volume Elevation = 46.98 ft

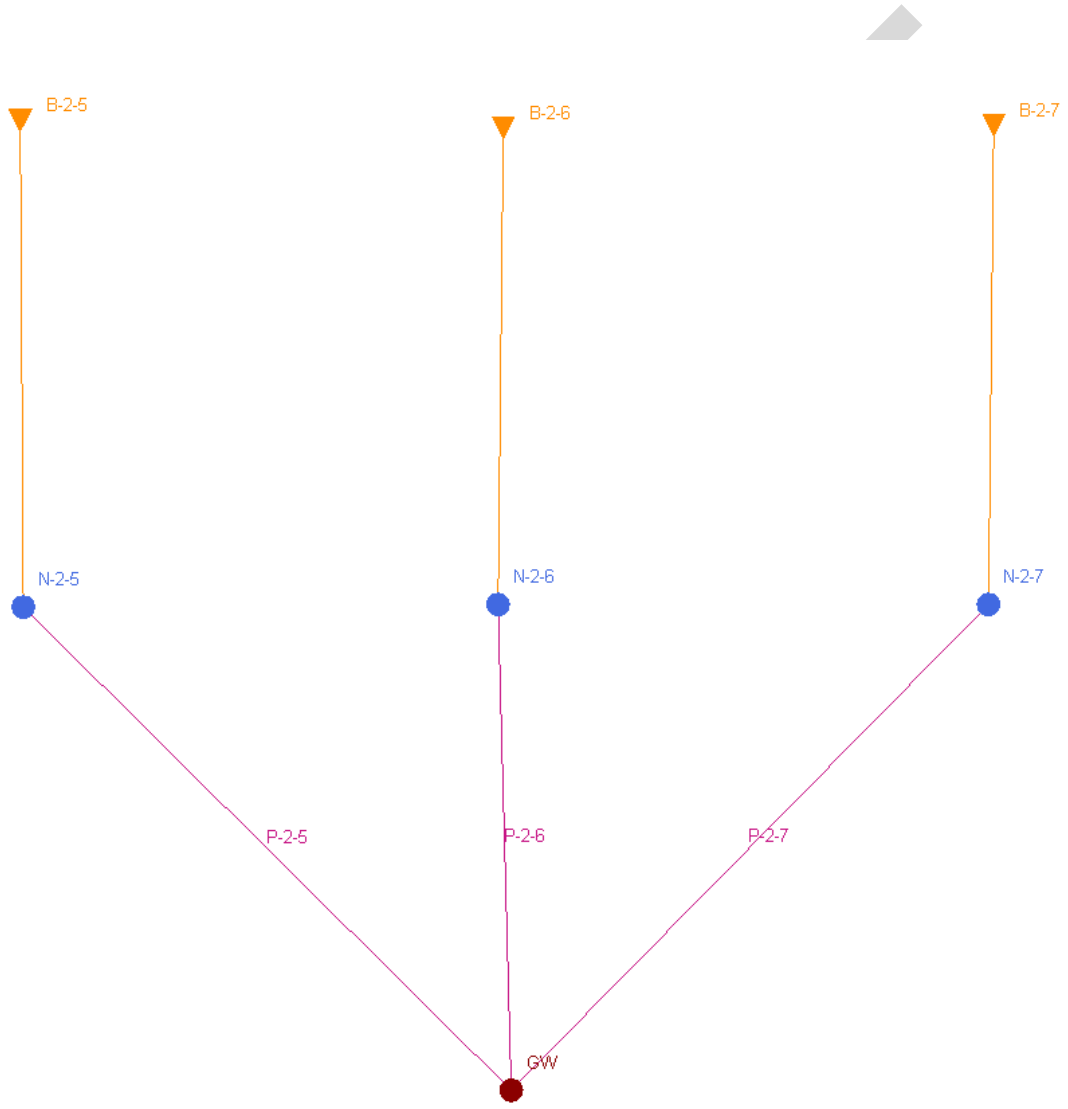
Pond Data (Pond 2-7, Alt. 2)			
Elevation	Area (ac)	Volume (ac-ft)	
65	1.19	0.00	
66	1.35	1.27	
67	1.52	2.71	
68	1.69	4.32	
69	1.86	6.09	
70	2.04	8.04	Max Peak Design Stage
71	2.22	10.17	Inside of Berm
72	2.98	12.77	Outside Top of Berm

Treatment Volume Elevation = 67.72 ft

Attenuation Volume Elevation = 70.78 ft

DRAFT

NODAL DIAGRAM



Simple Basin: B-2-5

Scenario:	Icpr3
Node:	N-2-5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	16.0000 min
Max Allowable Q:	9999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	59.3600 ac
Curve Number:	39.0
% Impervious:	26.00
% DCIA:	26.00
% Direct:	0.00
Rainfall Name:	~FLMOD

Comment:

Simple Basin: B-2-6

Scenario:	Icpr3
Node:	N-2-6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	9999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	67.8600 ac
Curve Number:	39.0
% Impervious:	28.00
% DCIA:	28.00
% Direct:	0.00
Rainfall Name:	~FLMOD

Comment:

Simple Basin: B-2-7

Scenario:	Icpr3
Node:	N-2-7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	9999.00 cfs

DRAFT

Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 55.4900 ac
Curve Number: 39.0
% Impervious: 21.00
% DCIA: 21.00
% Direct: 0.00
Rainfall Name: ~FLMOD

Comment:

Node: GW

Scenario: Icpr3
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: -10.00 ft
Warning Stage: -10.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	-10.00
0	0	0	300.0000	-10.00

Comment:

Node: N-2-5

Scenario: Icpr3
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 66.00 ft
Warning Stage: 74.00 ft

Stage [ft]	Area [ac]	Area [ft2]
66.00	4.2300	184259
67.00	4.4400	193406
68.00	4.6500	202554
69.00	4.8600	211702
70.00	5.0700	220849
71.00	5.2900	230432
72.00	5.5100	240016
73.00	5.7400	250034
74.00	5.9700	260053
75.00	6.2000	270072

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Comment:

Node: N-2-6

Scenario: Icpr3
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 48.00 ft
Warning Stage: 53.00 ft

Stage [ft]	Area [ac]	Area [ft2]
48.00	4.9800	216929
49.00	5.2100	226948
50.00	5.4400	236966
51.00	5.6700	246985
52.00	5.9100	257440
53.00	6.1500	267894
54.00	6.3900	278348

Comment:

Node: N-2-7

Scenario: Icpr3
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 62.00 ft
Warning Stage: 70.00 ft

Stage [ft]	Area [ac]	Area [ft2]
62.00	1.5100	65776
63.00	1.6300	71003
64.00	1.7500	76230
65.00	1.8700	81457
66.00	2.0000	87120
67.00	2.1300	92783
68.00	2.2000	95832
69.00	2.4000	104544
70.00	2.5400	110642
71.00	2.6800	116741

Comment:

Percolation Link: P-2-5

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Scenario:	Icpr3		
From Node:	N-2-5	Surface Area Option:	Vary Based on Stage/Area Table
To Node:	GW	Vertical Flow Termination:	Horizontal Flow Algorithm
Link Count:	1	Perimeter 1:	500.00 ft
Flow Direction:	Both	Perimeter 2:	1000.00 ft
Aquifer Base Elevation:	3.00 ft	Perimeter 3:	2000.00 ft
Water Table Elevation:	5.00 ft	Distance P1 to P2:	50.00 ft
Annual Recharge Rate:	0 ipy	Distance P2 to P3:	450.00 ft
Horizontal Conductivity:	2.000 fpd	# of Cells P1 to P2:	10
Vertical Conductivity:	2.000 fpd	# of Cells P2 to P3:	45
Fillable Porosity:	0.250		
Layer Thickness:	10.00 ft		

Comment:

Percolation Link: P-2-6

Scenario:	Icpr3	Surface Area Option:	Vary Based on Stage/Area Table
From Node:	N-2-6	Vertical Flow Termination:	Horizontal Flow Algorithm
To Node:	GW	Perimeter 1:	704.00 ft
Link Count:	1	Perimeter 2:	1096.00 ft
Flow Direction:	Both	Perimeter 3:	2500.00 ft
Aquifer Base Elevation:	2.80 ft	Distance P1 to P2:	50.00 ft
Water Table Elevation:	4.80 ft	Distance P2 to P3:	450.00 ft
Annual Recharge Rate:	0 ipy	# of Cells P1 to P2:	10
Horizontal Conductivity:	6.000 fpd	# of Cells P2 to P3:	45
Vertical Conductivity:	6.000 fpd		
Fillable Porosity:	0.250		
Layer Thickness:	10.00 ft		

Comment:

Percolation Link: P-2-7

Scenario:	Icpr3	Surface Area Option:	Vary Based on Stage/Area Table
From Node:	N-2-7	Vertical Flow Termination:	Horizontal Flow Algorithm
To Node:	GW	Perimeter 1:	1300.00 ft
Link Count:	1	Perimeter 2:	1625.00 ft
Flow Direction:	Both	Perimeter 3:	4500.00 ft
Aquifer Base Elevation:	3.25 ft	Distance P1 to P2:	50.00 ft
Water Table Elevation:	5.25 ft	Distance P2 to P3:	450.00 ft
Annual Recharge Rate:	0 ipy	# of Cells P1 to P2:	10
Horizontal Conductivity:	12.000 fpd	# of Cells P2 to P3:	45
Vertical Conductivity:	12.000 fpd		
Fillable Porosity:	0.250		
Layer Thickness:	7.00 ft		

Comment:

DRAFT

Simulation: 120H100YR

Scenario: Icpr3
Run Date/Time: 3/12/2020 2:30:49 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	250.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	30.0000	5.0000
0	0	0	120.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000
0	0	0	30.0000	10.0000
0	0	0	150.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:

Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR

IA Recovery Time: 24.0000 hr

DRAFT

Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	SWFWMD-120hr
		Rainfall Amount:	16.30 in
Edge Length Option:	Automatic	Storm Duration:	120.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	113 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 120H500YR

Scenario:	Icpr3
Run Date/Time:	3/13/2020 8:50:23 AM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	250.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	30.0000	5.0000
0	0	0	120.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]

DRAFT

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	50.0000	5.0000
0	0	0	120.0000	15.0000
0	0	0	160.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: SWFWMD-120hr
Rainfall Amount: 19.80 in
Storm Duration: 120.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 113 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 120HR10YR

Scenario: Icpr3
Run Date/Time: 9/10/2020 2:24:26 PM
Program Version: ICPR4 4.05.01

General

DRAFT

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	250.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	30.0000	5.0000
0	0	0	120.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	50.0000	5.0000
0	0	0	120.0000	15.0000
0	0	0	160.0000	30.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Green-Ampt Set: ICPR3

Vertical Layers Set:

Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR

Max Iterations: 6

Over-Relax Weight Fact: 0.5 dec

dZ Tolerance: 0.0010 ft

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Opt: Global

DRAFT

Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	SWFWMD-120hr
		Rainfall Amount:	10.90 in
Edge Length Option:	Automatic	Storm Duration:	120.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	113 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 120HR50YR

Scenario:	Icpr3
Run Date/Time:	9/10/2020 4:55:10 PM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	250.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	30.0000	5.0000
0	0	0	120.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	50.0000	5.0000
0	0	0	120.0000	15.0000
0	0	0	160.0000	30.0000

DRAFT

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: SWFWMD-120hr
Rainfall Amount: 14.60 in
Storm Duration: 120.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 113 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 168HR100YR

Scenario: Icpr3
Run Date/Time: 3/13/2020 4:37:01 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	250.0000

DRAFT

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	30.0000	5.0000
0	0	0	170.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	30.0000	5.0000
0	0	0	120.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:

Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Opt: Global

Rainfall Name: DOT168
Rainfall Amount: 17.75 in
Storm Duration: 168.0000 hr

Dflt Damping (1D): 0.0050 ft
Min Node Srf Area 113 ft2

DRAFT

(1D):
Energy Switch (1D): Energy

Comment:

Simulation: 24HR100YR

Scenario: Icpr3
Run Date/Time: 10/9/2020 10:30:23 AM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	125.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	30.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	36.0000	30.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3
Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:

DRAFT

Green-Ampt Set:	ICPR3
Vertical Layers Set:	
Impervious Set:	ICPR3

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Flmod
		Rainfall Amount:	11.50 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	113 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 24HR10YR

Scenario:	Icpr3
Run Date/Time:	9/10/2020 8:19:15 PM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	100.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]

DRAFT

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	30.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	24.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Flmod
Rainfall Amount: 6.90 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 113 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 24HR2.33YR

Scenario: Icpr3

DRAFT

Run Date/Time: 9/10/2020 9:16:56 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	100.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	30.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	24.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3
Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Global

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		Opt:	
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Flmod
		Rainfall Amount:	4.90 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	113 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 24HR25YR

Scenario:	Icpr3
Run Date/Time:	10/9/2020 11:39:54 AM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	100.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	30.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	24.0000	15.0000

Restart File

Save Restart: False

DRAFT

Resources & Lookup Tables

Resources

Rainfall Folder:	ICPR3
Unit Hydrograph Folder:	ICPR3

Lookup Tables

Boundary Stage Set:	
Extern Hydrograph Set:	
Curve Number Set:	
Green-Ampt Set:	ICPR3
Vertical Layers Set:	
Impervious Set:	ICPR3

Tolerances & Options

Time Marching:	SAOR
Max Iterations:	6
Over-Relax Weight Fact:	0.5 dec
dZ Tolerance:	0.0010 ft
Max dZ:	1.0000 ft
Link Optimizer Tol:	0.0001 ft
Edge Length Option:	Automatic
IA Recovery Time:	24.0000 hr
Smp/Man Basin Rain Opt:	Global
Rainfall Name:	Flmod
Rainfall Amount:	8.70 in
Storm Duration:	24.0000 hr
Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (1D):	113 ft2
Energy Switch (1D):	Energy

Comment:

Simulation: 24HR2YR

Scenario:	Icpr3
Run Date/Time:	9/10/2020 11:06:53 PM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	100.0000

Hydrology [sec]	Surface Hydraulics [sec]

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Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	30.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	24.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Flmod
Rainfall Amount: 4.20 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 113 ft2
Energy Switch (1D): Energy

Comment: 5

DRAFT

Simulation: 24HR500YR

Scenario: Icpr3
Run Date/Time: 9/11/2020 12:02:30 AM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	100.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	30.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	24.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:

Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

DRAFT

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Flmod
		Rainfall Amount:	14.30 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	113 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 24HR50YR

Scenario:	Icpr3
Run Date/Time:	N/A
Program Version:	N/A

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	100.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	30.0000	15.0000

Surface Hydraulics

DRAFT

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	24.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Flmod
Rainfall Amount: 9.80 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 113 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 24HR5YR

Scenario: Icpr3
Run Date/Time: N/A
Program Version: N/A

General

Run Mode: Normal

DRAFT

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	100.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	30.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	24.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:

Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Flmod
Rainfall Amount: 5.80 in
Storm Duration: 24.0000 hr

DRAFT

Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (1D):	113 ft2
Energy Switch (1D):	Energy

Comment:

Simulation: 72HR100YR

Scenario:	Icpr3
Run Date/Time:	N/A
Program Version:	N/A

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	120.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
0	0	0	30.0000	5.0000
0	0	0	100.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
0	0	0	100.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Lookup Tables

DRAFT

Rainfall Folder:	ICPR3	Boundary Stage Set:	
		Extern Hydrograph Set:	
Unit Hydrograph Folder:	ICPR3	Curve Number Set:	
		Green-Ampt Set:	ICPR3
		Vertical Layers Set:	
		Impervious Set:	ICPR3

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Fdot-72
		Rainfall Amount:	14.10 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	113 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: IC

Scenario:	Icpr3
Run Date/Time:	N/A
Program Version:	N/A

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	5.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

DRAFT

Hydrology

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: ICPR3

Unit Hydrograph Folder: ICPR3

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set: ICPR3
Vertical Layers Set:
Impervious Set: ICPR3

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Basin Specification
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 113 ft2
Energy Switch (1D): Energy

Comment:

DRAFT

Node Max Conditions [Icpr3]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
GW	24HR100YR	-10.00	-10.00	0.0000	3956.71	0.00	0
N-2-5	24HR100YR	74.00	69.70	0.0002	149.73	5.05	218150
N-2-6	24HR100YR	53.00	50.49	0.0002	182.62	16.79	241831
N-2-7	24HR100YR	70.00	67.25	0.0007	158.28	12.99	93545
GW	24HR25YR	-10.00	-10.00	0.0000	3956.71	0.00	0
N-2-5	24HR25YR	74.00	68.07	0.0003	90.81	4.70	203230
N-2-6	24HR25YR	53.00	49.34	0.0003	112.39	15.99	230317
N-2-7	24HR25YR	70.00	64.89	0.0006	92.05	11.24	80904

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Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	0.0000	0
24HR100YR	B-2-5	N-2-5	0.0833	10
24HR100YR	B-2-5	N-2-5	0.1667	80
24HR100YR	B-2-5	N-2-5	0.2667	310
24HR100YR	B-2-5	N-2-5	0.3333	544
24HR100YR	B-2-5	N-2-5	0.4167	903
24HR100YR	B-2-5	N-2-5	0.5000	1320
24HR100YR	B-2-5	N-2-5	0.5833	1782
24HR100YR	B-2-5	N-2-5	0.6667	2280
24HR100YR	B-2-5	N-2-5	0.7500	2807
24HR100YR	B-2-5	N-2-5	0.8333	3357
24HR100YR	B-2-5	N-2-5	0.9167	3928
24HR100YR	B-2-5	N-2-5	1.0000	4517
24HR100YR	B-2-5	N-2-5	1.0833	5121
24HR100YR	B-2-5	N-2-5	1.1667	5743
24HR100YR	B-2-5	N-2-5	1.2500	6384
24HR100YR	B-2-5	N-2-5	1.3333	7041
24HR100YR	B-2-5	N-2-5	1.4167	7708
24HR100YR	B-2-5	N-2-5	1.5000	8384
24HR100YR	B-2-5	N-2-5	1.6000	9203
24HR100YR	B-2-5	N-2-5	1.6833	9889
24HR100YR	B-2-5	N-2-5	1.7667	10577
24HR100YR	B-2-5	N-2-5	1.8500	11267
24HR100YR	B-2-5	N-2-5	1.9333	11959
24HR100YR	B-2-5	N-2-5	2.0167	12652
24HR100YR	B-2-5	N-2-5	2.1000	13348
24HR100YR	B-2-5	N-2-5	2.1833	14050
24HR100YR	B-2-5	N-2-5	2.2667	14761
24HR100YR	B-2-5	N-2-5	2.3500	15480

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	2.4333	16205
24HR100YR	B-2-5	N-2-5	2.5167	16934
24HR100YR	B-2-5	N-2-5	2.6000	17666
24HR100YR	B-2-5	N-2-5	2.6833	18401
24HR100YR	B-2-5	N-2-5	2.7667	19138
24HR100YR	B-2-5	N-2-5	2.8500	19876
24HR100YR	B-2-5	N-2-5	2.9333	20616
24HR100YR	B-2-5	N-2-5	3.0167	21358
24HR100YR	B-2-5	N-2-5	3.1000	22102
24HR100YR	B-2-5	N-2-5	3.1833	22853
24HR100YR	B-2-5	N-2-5	3.2667	23617
24HR100YR	B-2-5	N-2-5	3.3500	24391
24HR100YR	B-2-5	N-2-5	3.4333	25173
24HR100YR	B-2-5	N-2-5	3.5167	25962
24HR100YR	B-2-5	N-2-5	3.6000	26755
24HR100YR	B-2-5	N-2-5	3.6833	27551
24HR100YR	B-2-5	N-2-5	3.7667	28350
24HR100YR	B-2-5	N-2-5	3.8500	29152
24HR100YR	B-2-5	N-2-5	3.9333	29956
24HR100YR	B-2-5	N-2-5	4.0167	30762
24HR100YR	B-2-5	N-2-5	4.1000	31571
24HR100YR	B-2-5	N-2-5	4.1833	32394
24HR100YR	B-2-5	N-2-5	4.2667	33235
24HR100YR	B-2-5	N-2-5	4.3500	34093
24HR100YR	B-2-5	N-2-5	4.4333	34961
24HR100YR	B-2-5	N-2-5	4.5167	35839
24HR100YR	B-2-5	N-2-5	4.6000	36724
24HR100YR	B-2-5	N-2-5	4.6833	37615
24HR100YR	B-2-5	N-2-5	4.7667	38509

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	4.8500	39407
24HR100YR	B-2-5	N-2-5	4.9333	40309
24HR100YR	B-2-5	N-2-5	5.0167	41213
24HR100YR	B-2-5	N-2-5	5.1000	42121
24HR100YR	B-2-5	N-2-5	5.1833	43036
24HR100YR	B-2-5	N-2-5	5.2667	43963
24HR100YR	B-2-5	N-2-5	5.3500	44898
24HR100YR	B-2-5	N-2-5	5.4333	45841
24HR100YR	B-2-5	N-2-5	5.5167	46788
24HR100YR	B-2-5	N-2-5	5.6000	47739
24HR100YR	B-2-5	N-2-5	5.6833	48693
24HR100YR	B-2-5	N-2-5	5.7667	49650
24HR100YR	B-2-5	N-2-5	5.8500	50608
24HR100YR	B-2-5	N-2-5	5.9333	51568
24HR100YR	B-2-5	N-2-5	6.0167	52529
24HR100YR	B-2-5	N-2-5	6.1000	53496
24HR100YR	B-2-5	N-2-5	6.1833	54482
24HR100YR	B-2-5	N-2-5	6.2667	55497
24HR100YR	B-2-5	N-2-5	6.3500	56536
24HR100YR	B-2-5	N-2-5	6.4333	57594
24HR100YR	B-2-5	N-2-5	6.5167	58665
24HR100YR	B-2-5	N-2-5	6.6000	59748
24HR100YR	B-2-5	N-2-5	6.6833	60839
24HR100YR	B-2-5	N-2-5	6.7667	61937
24HR100YR	B-2-5	N-2-5	6.8500	63041
24HR100YR	B-2-5	N-2-5	6.9333	64149
24HR100YR	B-2-5	N-2-5	7.0167	65262
24HR100YR	B-2-5	N-2-5	7.1000	66383
24HR100YR	B-2-5	N-2-5	7.1833	67525

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	7.2667	68698
24HR100YR	B-2-5	N-2-5	7.3500	69897
24HR100YR	B-2-5	N-2-5	7.4333	71115
24HR100YR	B-2-5	N-2-5	7.5167	72348
24HR100YR	B-2-5	N-2-5	7.6000	73593
24HR100YR	B-2-5	N-2-5	7.6833	74846
24HR100YR	B-2-5	N-2-5	7.7667	76107
24HR100YR	B-2-5	N-2-5	7.8500	77373
24HR100YR	B-2-5	N-2-5	7.9333	78644
24HR100YR	B-2-5	N-2-5	8.0167	79920
24HR100YR	B-2-5	N-2-5	8.1000	81204
24HR100YR	B-2-5	N-2-5	8.1833	82517
24HR100YR	B-2-5	N-2-5	8.2500	83595
24HR100YR	B-2-5	N-2-5	8.3333	84975
24HR100YR	B-2-5	N-2-5	8.4167	86381
24HR100YR	B-2-5	N-2-5	8.5000	87807
24HR100YR	B-2-5	N-2-5	8.5833	89252
24HR100YR	B-2-5	N-2-5	8.6667	90729
24HR100YR	B-2-5	N-2-5	8.7500	92252
24HR100YR	B-2-5	N-2-5	8.8333	93818
24HR100YR	B-2-5	N-2-5	8.9167	95416
24HR100YR	B-2-5	N-2-5	9.0000	97038
24HR100YR	B-2-5	N-2-5	9.0833	98683
24HR100YR	B-2-5	N-2-5	9.1667	100354
24HR100YR	B-2-5	N-2-5	9.2500	102056
24HR100YR	B-2-5	N-2-5	9.3333	103786
24HR100YR	B-2-5	N-2-5	9.4167	105536
24HR100YR	B-2-5	N-2-5	9.5000	107304
24HR100YR	B-2-5	N-2-5	9.5833	109089

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	9.6667	110915
24HR100YR	B-2-5	N-2-5	9.7500	112804
24HR100YR	B-2-5	N-2-5	9.8333	114751
24HR100YR	B-2-5	N-2-5	9.9167	116740
24HR100YR	B-2-5	N-2-5	10.0000	118762
24HR100YR	B-2-5	N-2-5	10.0833	120818
24HR100YR	B-2-5	N-2-5	10.1667	122945
24HR100YR	B-2-5	N-2-5	10.2500	125180
24HR100YR	B-2-5	N-2-5	10.3333	127513
24HR100YR	B-2-5	N-2-5	10.4167	129921
24HR100YR	B-2-5	N-2-5	10.5000	132386
24HR100YR	B-2-5	N-2-5	10.5833	134909
24HR100YR	B-2-5	N-2-5	10.6667	137539
24HR100YR	B-2-5	N-2-5	10.7500	140327
24HR100YR	B-2-5	N-2-5	10.8333	143256
24HR100YR	B-2-5	N-2-5	10.9167	146294
24HR100YR	B-2-5	N-2-5	11.0000	149416
24HR100YR	B-2-5	N-2-5	11.0833	152608
24HR100YR	B-2-5	N-2-5	11.1667	155873
24HR100YR	B-2-5	N-2-5	11.2500	159215
24HR100YR	B-2-5	N-2-5	11.3333	162679
24HR100YR	B-2-5	N-2-5	11.4167	166546
24HR100YR	B-2-5	N-2-5	11.5000	171125
24HR100YR	B-2-5	N-2-5	11.5833	176712
24HR100YR	B-2-5	N-2-5	11.6667	184882
24HR100YR	B-2-5	N-2-5	11.7500	197501
24HR100YR	B-2-5	N-2-5	11.8333	215088
24HR100YR	B-2-5	N-2-5	11.9167	239347
24HR100YR	B-2-5	N-2-5	12.0000	272450

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	12.0833	313692
24HR100YR	B-2-5	N-2-5	12.1667	358317
24HR100YR	B-2-5	N-2-5	12.2500	401270
24HR100YR	B-2-5	N-2-5	12.3333	441794
24HR100YR	B-2-5	N-2-5	12.4167	479283
24HR100YR	B-2-5	N-2-5	12.5000	512747
24HR100YR	B-2-5	N-2-5	12.5833	542654
24HR100YR	B-2-5	N-2-5	12.6667	569469
24HR100YR	B-2-5	N-2-5	12.7500	593394
24HR100YR	B-2-5	N-2-5	12.8333	614839
24HR100YR	B-2-5	N-2-5	12.9167	634088
24HR100YR	B-2-5	N-2-5	13.0000	651331
24HR100YR	B-2-5	N-2-5	13.0833	666775
24HR100YR	B-2-5	N-2-5	13.1667	680537
24HR100YR	B-2-5	N-2-5	13.2500	692760
24HR100YR	B-2-5	N-2-5	13.3333	703702
24HR100YR	B-2-5	N-2-5	13.4167	713578
24HR100YR	B-2-5	N-2-5	13.5000	722599
24HR100YR	B-2-5	N-2-5	13.5833	730962
24HR100YR	B-2-5	N-2-5	13.6667	738762
24HR100YR	B-2-5	N-2-5	13.7500	746009
24HR100YR	B-2-5	N-2-5	13.8333	752809
24HR100YR	B-2-5	N-2-5	13.9167	759299
24HR100YR	B-2-5	N-2-5	14.0000	765567
24HR100YR	B-2-5	N-2-5	14.0833	771657
24HR100YR	B-2-5	N-2-5	14.1667	777558
24HR100YR	B-2-5	N-2-5	14.2500	783242
24HR100YR	B-2-5	N-2-5	14.3333	788742
24HR100YR	B-2-5	N-2-5	14.4167	794102

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	14.5000	799356
24HR100YR	B-2-5	N-2-5	14.5833	804515
24HR100YR	B-2-5	N-2-5	14.6667	809540
24HR100YR	B-2-5	N-2-5	14.7500	814385
24HR100YR	B-2-5	N-2-5	14.8333	819073
24HR100YR	B-2-5	N-2-5	14.9167	823643
24HR100YR	B-2-5	N-2-5	15.0000	828122
24HR100YR	B-2-5	N-2-5	15.0833	832527
24HR100YR	B-2-5	N-2-5	15.1667	836856
24HR100YR	B-2-5	N-2-5	15.2500	841102
24HR100YR	B-2-5	N-2-5	15.3333	845278
24HR100YR	B-2-5	N-2-5	15.4167	849399
24HR100YR	B-2-5	N-2-5	15.5000	853476
24HR100YR	B-2-5	N-2-5	15.5833	857513
24HR100YR	B-2-5	N-2-5	15.6667	861477
24HR100YR	B-2-5	N-2-5	15.7500	865332
24HR100YR	B-2-5	N-2-5	15.8333	869091
24HR100YR	B-2-5	N-2-5	15.9167	872779
24HR100YR	B-2-5	N-2-5	16.0000	876413
24HR100YR	B-2-5	N-2-5	16.0833	880002
24HR100YR	B-2-5	N-2-5	16.1667	883535
24HR100YR	B-2-5	N-2-5	16.2500	887001
24HR100YR	B-2-5	N-2-5	16.3333	890407
24HR100YR	B-2-5	N-2-5	16.4167	893767
24HR100YR	B-2-5	N-2-5	16.5000	897091
24HR100YR	B-2-5	N-2-5	16.5833	900383
24HR100YR	B-2-5	N-2-5	16.6667	903628
24HR100YR	B-2-5	N-2-5	16.7500	906812
24HR100YR	B-2-5	N-2-5	16.8333	909942

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	16.9167	913031
24HR100YR	B-2-5	N-2-5	17.0000	916089
24HR100YR	B-2-5	N-2-5	17.0833	919123
24HR100YR	B-2-5	N-2-5	17.1667	922140
24HR100YR	B-2-5	N-2-5	17.2500	925145
24HR100YR	B-2-5	N-2-5	17.3333	928139
24HR100YR	B-2-5	N-2-5	17.4167	931126
24HR100YR	B-2-5	N-2-5	17.5000	934106
24HR100YR	B-2-5	N-2-5	17.5833	937075
24HR100YR	B-2-5	N-2-5	17.6667	939990
24HR100YR	B-2-5	N-2-5	17.7500	942810
24HR100YR	B-2-5	N-2-5	17.8333	945546
24HR100YR	B-2-5	N-2-5	17.9167	948218
24HR100YR	B-2-5	N-2-5	18.0000	950842
24HR100YR	B-2-5	N-2-5	18.0833	953433
24HR100YR	B-2-5	N-2-5	18.1667	956022
24HR100YR	B-2-5	N-2-5	18.2500	958636
24HR100YR	B-2-5	N-2-5	18.3333	961276
24HR100YR	B-2-5	N-2-5	18.4167	963933
24HR100YR	B-2-5	N-2-5	18.5000	966601
24HR100YR	B-2-5	N-2-5	18.5833	969269
24HR100YR	B-2-5	N-2-5	18.6667	971894
24HR100YR	B-2-5	N-2-5	18.7500	974429
24HR100YR	B-2-5	N-2-5	18.8333	976885
24HR100YR	B-2-5	N-2-5	18.9167	979283
24HR100YR	B-2-5	N-2-5	19.0000	981638
24HR100YR	B-2-5	N-2-5	19.0833	983964
24HR100YR	B-2-5	N-2-5	19.1667	986292
24HR100YR	B-2-5	N-2-5	19.2500	988650

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	19.3333	991036
24HR100YR	B-2-5	N-2-5	19.4167	993440
24HR100YR	B-2-5	N-2-5	19.5000	995857
24HR100YR	B-2-5	N-2-5	19.5833	998279
24HR100YR	B-2-5	N-2-5	19.6667	1000682
24HR100YR	B-2-5	N-2-5	19.7500	1003044
24HR100YR	B-2-5	N-2-5	19.8333	1005367
24HR100YR	B-2-5	N-2-5	19.9167	1007665
24HR100YR	B-2-5	N-2-5	20.0000	1009944
24HR100YR	B-2-5	N-2-5	20.0833	1012206
24HR100YR	B-2-5	N-2-5	20.1667	1014432
24HR100YR	B-2-5	N-2-5	20.2500	1016604
24HR100YR	B-2-5	N-2-5	20.3333	1018726
24HR100YR	B-2-5	N-2-5	20.4167	1020811
24HR100YR	B-2-5	N-2-5	20.5000	1022865
24HR100YR	B-2-5	N-2-5	20.5833	1024895
24HR100YR	B-2-5	N-2-5	20.6667	1026907
24HR100YR	B-2-5	N-2-5	20.7500	1028903
24HR100YR	B-2-5	N-2-5	20.8333	1030887
24HR100YR	B-2-5	N-2-5	20.9167	1032862
24HR100YR	B-2-5	N-2-5	21.0000	1034829
24HR100YR	B-2-5	N-2-5	21.0833	1036789
24HR100YR	B-2-5	N-2-5	21.1667	1038745
24HR100YR	B-2-5	N-2-5	21.2500	1040698
24HR100YR	B-2-5	N-2-5	21.3333	1042649
24HR100YR	B-2-5	N-2-5	21.4167	1044600
24HR100YR	B-2-5	N-2-5	21.5000	1046549
24HR100YR	B-2-5	N-2-5	21.5833	1048499
24HR100YR	B-2-5	N-2-5	21.6667	1050450

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	21.7500	1052401
24HR100YR	B-2-5	N-2-5	21.8333	1054354
24HR100YR	B-2-5	N-2-5	21.9167	1056307
24HR100YR	B-2-5	N-2-5	22.0000	1058262
24HR100YR	B-2-5	N-2-5	22.0833	1060217
24HR100YR	B-2-5	N-2-5	22.1667	1062174
24HR100YR	B-2-5	N-2-5	22.2500	1064131
24HR100YR	B-2-5	N-2-5	22.3333	1066090
24HR100YR	B-2-5	N-2-5	22.4167	1068050
24HR100YR	B-2-5	N-2-5	22.5000	1070012
24HR100YR	B-2-5	N-2-5	22.5833	1071970
24HR100YR	B-2-5	N-2-5	22.6667	1073902
24HR100YR	B-2-5	N-2-5	22.7500	1075788
24HR100YR	B-2-5	N-2-5	22.8333	1077631
24HR100YR	B-2-5	N-2-5	22.9167	1079442
24HR100YR	B-2-5	N-2-5	23.0000	1081229
24HR100YR	B-2-5	N-2-5	23.0833	1082996
24HR100YR	B-2-5	N-2-5	23.1667	1084749
24HR100YR	B-2-5	N-2-5	23.2500	1086489
24HR100YR	B-2-5	N-2-5	23.3333	1088219
24HR100YR	B-2-5	N-2-5	23.4167	1089940
24HR100YR	B-2-5	N-2-5	23.5000	1091654
24HR100YR	B-2-5	N-2-5	23.5833	1093357
24HR100YR	B-2-5	N-2-5	23.6667	1095029
24HR100YR	B-2-5	N-2-5	23.7500	1096649
24HR100YR	B-2-5	N-2-5	23.8500	1098533
24HR100YR	B-2-5	N-2-5	23.9333	1100066
24HR100YR	B-2-5	N-2-5	24.0167	1101574
24HR100YR	B-2-5	N-2-5	24.1000	1103027

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	24.1833	1104303
24HR100YR	B-2-5	N-2-5	24.2667	1105319
24HR100YR	B-2-5	N-2-5	24.3500	1106112
24HR100YR	B-2-5	N-2-5	24.4333	1106739
24HR100YR	B-2-5	N-2-5	24.5167	1107238
24HR100YR	B-2-5	N-2-5	24.6000	1107636
24HR100YR	B-2-5	N-2-5	24.6833	1107953
24HR100YR	B-2-5	N-2-5	24.7667	1108207
24HR100YR	B-2-5	N-2-5	24.8500	1108407
24HR100YR	B-2-5	N-2-5	24.9333	1108562
24HR100YR	B-2-5	N-2-5	25.0167	1108676
24HR100YR	B-2-5	N-2-5	25.1000	1108758
24HR100YR	B-2-5	N-2-5	25.1833	1108814
24HR100YR	B-2-5	N-2-5	25.2667	1108850
24HR100YR	B-2-5	N-2-5	25.3500	1108872
24HR100YR	B-2-5	N-2-5	25.4333	1108884
24HR100YR	B-2-5	N-2-5	25.5167	1108889
24HR100YR	B-2-5	N-2-5	25.6000	1108890
24HR100YR	B-2-5	N-2-5	25.6833	1108890
24HR100YR	B-2-5	N-2-5	25.7667	1108890
24HR100YR	B-2-5	N-2-5	25.8500	1108890
24HR100YR	B-2-5	N-2-5	25.9333	1108890
24HR100YR	B-2-5	N-2-5	26.0167	1108890
24HR100YR	B-2-5	N-2-5	26.1000	1108890
24HR100YR	B-2-5	N-2-5	26.1833	1108890
24HR100YR	B-2-5	N-2-5	26.2667	1108890
24HR100YR	B-2-5	N-2-5	26.3500	1108890
24HR100YR	B-2-5	N-2-5	26.4333	1108890
24HR100YR	B-2-5	N-2-5	26.5167	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	26.6000	1108890
24HR100YR	B-2-5	N-2-5	26.6833	1108890
24HR100YR	B-2-5	N-2-5	26.7667	1108890
24HR100YR	B-2-5	N-2-5	26.8500	1108890
24HR100YR	B-2-5	N-2-5	26.9333	1108890
24HR100YR	B-2-5	N-2-5	27.0167	1108890
24HR100YR	B-2-5	N-2-5	27.1000	1108890
24HR100YR	B-2-5	N-2-5	27.1833	1108890
24HR100YR	B-2-5	N-2-5	27.2667	1108890
24HR100YR	B-2-5	N-2-5	27.3500	1108890
24HR100YR	B-2-5	N-2-5	27.4333	1108890
24HR100YR	B-2-5	N-2-5	27.5167	1108890
24HR100YR	B-2-5	N-2-5	27.6000	1108890
24HR100YR	B-2-5	N-2-5	27.6833	1108890
24HR100YR	B-2-5	N-2-5	27.7667	1108890
24HR100YR	B-2-5	N-2-5	27.8500	1108890
24HR100YR	B-2-5	N-2-5	27.9333	1108890
24HR100YR	B-2-5	N-2-5	28.0167	1108890
24HR100YR	B-2-5	N-2-5	28.1000	1108890
24HR100YR	B-2-5	N-2-5	28.1833	1108890
24HR100YR	B-2-5	N-2-5	28.2667	1108890
24HR100YR	B-2-5	N-2-5	28.3500	1108890
24HR100YR	B-2-5	N-2-5	28.4333	1108890
24HR100YR	B-2-5	N-2-5	28.5167	1108890
24HR100YR	B-2-5	N-2-5	28.6000	1108890
24HR100YR	B-2-5	N-2-5	28.6833	1108890
24HR100YR	B-2-5	N-2-5	28.7667	1108890
24HR100YR	B-2-5	N-2-5	28.8500	1108890
24HR100YR	B-2-5	N-2-5	28.9333	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	29.0167	1108890
24HR100YR	B-2-5	N-2-5	29.1000	1108890
24HR100YR	B-2-5	N-2-5	29.1833	1108890
24HR100YR	B-2-5	N-2-5	29.2667	1108890
24HR100YR	B-2-5	N-2-5	29.3500	1108890
24HR100YR	B-2-5	N-2-5	29.4333	1108890
24HR100YR	B-2-5	N-2-5	29.5167	1108890
24HR100YR	B-2-5	N-2-5	29.6000	1108890
24HR100YR	B-2-5	N-2-5	29.6833	1108890
24HR100YR	B-2-5	N-2-5	29.7667	1108890
24HR100YR	B-2-5	N-2-5	29.8500	1108890
24HR100YR	B-2-5	N-2-5	29.9333	1108890
24HR100YR	B-2-5	N-2-5	30.0167	1108890
24HR100YR	B-2-5	N-2-5	30.2667	1108890
24HR100YR	B-2-5	N-2-5	30.5167	1108890
24HR100YR	B-2-5	N-2-5	30.7667	1108890
24HR100YR	B-2-5	N-2-5	31.0167	1108890
24HR100YR	B-2-5	N-2-5	31.2667	1108890
24HR100YR	B-2-5	N-2-5	31.5167	1108890
24HR100YR	B-2-5	N-2-5	31.7667	1108890
24HR100YR	B-2-5	N-2-5	32.0167	1108890
24HR100YR	B-2-5	N-2-5	32.2667	1108890
24HR100YR	B-2-5	N-2-5	32.5167	1108890
24HR100YR	B-2-5	N-2-5	32.7667	1108890
24HR100YR	B-2-5	N-2-5	33.0167	1108890
24HR100YR	B-2-5	N-2-5	33.2667	1108890
24HR100YR	B-2-5	N-2-5	33.5167	1108890
24HR100YR	B-2-5	N-2-5	33.7667	1108890
24HR100YR	B-2-5	N-2-5	34.0167	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	34.2667	1108890
24HR100YR	B-2-5	N-2-5	34.5167	1108890
24HR100YR	B-2-5	N-2-5	34.7667	1108890
24HR100YR	B-2-5	N-2-5	35.0167	1108890
24HR100YR	B-2-5	N-2-5	35.2667	1108890
24HR100YR	B-2-5	N-2-5	35.5167	1108890
24HR100YR	B-2-5	N-2-5	35.7667	1108890
24HR100YR	B-2-5	N-2-5	36.0167	1108890
24HR100YR	B-2-5	N-2-5	36.2667	1108890
24HR100YR	B-2-5	N-2-5	36.5167	1108890
24HR100YR	B-2-5	N-2-5	36.7667	1108890
24HR100YR	B-2-5	N-2-5	37.0167	1108890
24HR100YR	B-2-5	N-2-5	37.2667	1108890
24HR100YR	B-2-5	N-2-5	37.5167	1108890
24HR100YR	B-2-5	N-2-5	37.7667	1108890
24HR100YR	B-2-5	N-2-5	38.0167	1108890
24HR100YR	B-2-5	N-2-5	38.2667	1108890
24HR100YR	B-2-5	N-2-5	38.5167	1108890
24HR100YR	B-2-5	N-2-5	38.7667	1108890
24HR100YR	B-2-5	N-2-5	39.0167	1108890
24HR100YR	B-2-5	N-2-5	39.2667	1108890
24HR100YR	B-2-5	N-2-5	39.5167	1108890
24HR100YR	B-2-5	N-2-5	39.7667	1108890
24HR100YR	B-2-5	N-2-5	40.0167	1108890
24HR100YR	B-2-5	N-2-5	40.2667	1108890
24HR100YR	B-2-5	N-2-5	40.5167	1108890
24HR100YR	B-2-5	N-2-5	40.7667	1108890
24HR100YR	B-2-5	N-2-5	41.0167	1108890
24HR100YR	B-2-5	N-2-5	41.2667	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	41.5167	1108890
24HR100YR	B-2-5	N-2-5	41.7667	1108890
24HR100YR	B-2-5	N-2-5	42.0167	1108890
24HR100YR	B-2-5	N-2-5	42.2667	1108890
24HR100YR	B-2-5	N-2-5	42.5167	1108890
24HR100YR	B-2-5	N-2-5	42.7667	1108890
24HR100YR	B-2-5	N-2-5	43.0167	1108890
24HR100YR	B-2-5	N-2-5	43.2667	1108890
24HR100YR	B-2-5	N-2-5	43.5167	1108890
24HR100YR	B-2-5	N-2-5	43.7667	1108890
24HR100YR	B-2-5	N-2-5	44.0167	1108890
24HR100YR	B-2-5	N-2-5	44.2667	1108890
24HR100YR	B-2-5	N-2-5	44.5167	1108890
24HR100YR	B-2-5	N-2-5	44.7667	1108890
24HR100YR	B-2-5	N-2-5	45.0167	1108890
24HR100YR	B-2-5	N-2-5	45.2667	1108890
24HR100YR	B-2-5	N-2-5	45.5167	1108890
24HR100YR	B-2-5	N-2-5	45.7667	1108890
24HR100YR	B-2-5	N-2-5	46.0167	1108890
24HR100YR	B-2-5	N-2-5	46.2667	1108890
24HR100YR	B-2-5	N-2-5	46.5167	1108890
24HR100YR	B-2-5	N-2-5	46.7667	1108890
24HR100YR	B-2-5	N-2-5	47.0167	1108890
24HR100YR	B-2-5	N-2-5	47.2667	1108890
24HR100YR	B-2-5	N-2-5	47.5167	1108890
24HR100YR	B-2-5	N-2-5	47.7667	1108890
24HR100YR	B-2-5	N-2-5	48.0167	1108890
24HR100YR	B-2-5	N-2-5	48.2667	1108890
24HR100YR	B-2-5	N-2-5	48.5167	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	48.7667	1108890
24HR100YR	B-2-5	N-2-5	49.0167	1108890
24HR100YR	B-2-5	N-2-5	49.2667	1108890
24HR100YR	B-2-5	N-2-5	49.5167	1108890
24HR100YR	B-2-5	N-2-5	49.7667	1108890
24HR100YR	B-2-5	N-2-5	50.0167	1108890
24HR100YR	B-2-5	N-2-5	50.2667	1108890
24HR100YR	B-2-5	N-2-5	50.5167	1108890
24HR100YR	B-2-5	N-2-5	50.7667	1108890
24HR100YR	B-2-5	N-2-5	51.0167	1108890
24HR100YR	B-2-5	N-2-5	51.2667	1108890
24HR100YR	B-2-5	N-2-5	51.5167	1108890
24HR100YR	B-2-5	N-2-5	51.7667	1108890
24HR100YR	B-2-5	N-2-5	52.0167	1108890
24HR100YR	B-2-5	N-2-5	52.2667	1108890
24HR100YR	B-2-5	N-2-5	52.5167	1108890
24HR100YR	B-2-5	N-2-5	52.7667	1108890
24HR100YR	B-2-5	N-2-5	53.0167	1108890
24HR100YR	B-2-5	N-2-5	53.2667	1108890
24HR100YR	B-2-5	N-2-5	53.5167	1108890
24HR100YR	B-2-5	N-2-5	53.7667	1108890
24HR100YR	B-2-5	N-2-5	54.0167	1108890
24HR100YR	B-2-5	N-2-5	54.2667	1108890
24HR100YR	B-2-5	N-2-5	54.5167	1108890
24HR100YR	B-2-5	N-2-5	54.7667	1108890
24HR100YR	B-2-5	N-2-5	55.0167	1108890
24HR100YR	B-2-5	N-2-5	55.2667	1108890
24HR100YR	B-2-5	N-2-5	55.5167	1108890
24HR100YR	B-2-5	N-2-5	55.7667	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	56.0167	1108890
24HR100YR	B-2-5	N-2-5	56.2667	1108890
24HR100YR	B-2-5	N-2-5	56.5167	1108890
24HR100YR	B-2-5	N-2-5	56.7667	1108890
24HR100YR	B-2-5	N-2-5	57.0167	1108890
24HR100YR	B-2-5	N-2-5	57.2667	1108890
24HR100YR	B-2-5	N-2-5	57.5167	1108890
24HR100YR	B-2-5	N-2-5	57.7667	1108890
24HR100YR	B-2-5	N-2-5	58.0167	1108890
24HR100YR	B-2-5	N-2-5	58.2667	1108890
24HR100YR	B-2-5	N-2-5	58.5167	1108890
24HR100YR	B-2-5	N-2-5	58.7667	1108890
24HR100YR	B-2-5	N-2-5	59.0167	1108890
24HR100YR	B-2-5	N-2-5	59.2667	1108890
24HR100YR	B-2-5	N-2-5	59.5167	1108890
24HR100YR	B-2-5	N-2-5	59.7667	1108890
24HR100YR	B-2-5	N-2-5	60.0167	1108890
24HR100YR	B-2-5	N-2-5	60.2667	1108890
24HR100YR	B-2-5	N-2-5	60.5167	1108890
24HR100YR	B-2-5	N-2-5	60.7667	1108890
24HR100YR	B-2-5	N-2-5	61.0167	1108890
24HR100YR	B-2-5	N-2-5	61.2667	1108890
24HR100YR	B-2-5	N-2-5	61.5167	1108890
24HR100YR	B-2-5	N-2-5	61.7667	1108890
24HR100YR	B-2-5	N-2-5	62.0167	1108890
24HR100YR	B-2-5	N-2-5	62.2667	1108890
24HR100YR	B-2-5	N-2-5	62.5167	1108890
24HR100YR	B-2-5	N-2-5	62.7667	1108890
24HR100YR	B-2-5	N-2-5	63.0167	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	63.2667	1108890
24HR100YR	B-2-5	N-2-5	63.5167	1108890
24HR100YR	B-2-5	N-2-5	63.7667	1108890
24HR100YR	B-2-5	N-2-5	64.0167	1108890
24HR100YR	B-2-5	N-2-5	64.2667	1108890
24HR100YR	B-2-5	N-2-5	64.5167	1108890
24HR100YR	B-2-5	N-2-5	64.7667	1108890
24HR100YR	B-2-5	N-2-5	65.0167	1108890
24HR100YR	B-2-5	N-2-5	65.2667	1108890
24HR100YR	B-2-5	N-2-5	65.5167	1108890
24HR100YR	B-2-5	N-2-5	65.7667	1108890
24HR100YR	B-2-5	N-2-5	66.0167	1108890
24HR100YR	B-2-5	N-2-5	66.2667	1108890
24HR100YR	B-2-5	N-2-5	66.5167	1108890
24HR100YR	B-2-5	N-2-5	66.7667	1108890
24HR100YR	B-2-5	N-2-5	67.0167	1108890
24HR100YR	B-2-5	N-2-5	67.2667	1108890
24HR100YR	B-2-5	N-2-5	67.5167	1108890
24HR100YR	B-2-5	N-2-5	67.7667	1108890
24HR100YR	B-2-5	N-2-5	68.0167	1108890
24HR100YR	B-2-5	N-2-5	68.2667	1108890
24HR100YR	B-2-5	N-2-5	68.5167	1108890
24HR100YR	B-2-5	N-2-5	68.7667	1108890
24HR100YR	B-2-5	N-2-5	69.0167	1108890
24HR100YR	B-2-5	N-2-5	69.2667	1108890
24HR100YR	B-2-5	N-2-5	69.5167	1108890
24HR100YR	B-2-5	N-2-5	69.7667	1108890
24HR100YR	B-2-5	N-2-5	70.0167	1108890
24HR100YR	B-2-5	N-2-5	70.2667	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	70.5167	1108890
24HR100YR	B-2-5	N-2-5	70.7667	1108890
24HR100YR	B-2-5	N-2-5	71.0167	1108890
24HR100YR	B-2-5	N-2-5	71.2667	1108890
24HR100YR	B-2-5	N-2-5	71.5167	1108890
24HR100YR	B-2-5	N-2-5	71.7667	1108890
24HR100YR	B-2-5	N-2-5	72.0167	1108890
24HR100YR	B-2-5	N-2-5	72.2667	1108890
24HR100YR	B-2-5	N-2-5	72.5167	1108890
24HR100YR	B-2-5	N-2-5	72.7667	1108890
24HR100YR	B-2-5	N-2-5	73.0167	1108890
24HR100YR	B-2-5	N-2-5	73.2667	1108890
24HR100YR	B-2-5	N-2-5	73.5167	1108890
24HR100YR	B-2-5	N-2-5	73.7667	1108890
24HR100YR	B-2-5	N-2-5	74.0167	1108890
24HR100YR	B-2-5	N-2-5	74.2667	1108890
24HR100YR	B-2-5	N-2-5	74.5167	1108890
24HR100YR	B-2-5	N-2-5	74.7667	1108890
24HR100YR	B-2-5	N-2-5	75.0167	1108890
24HR100YR	B-2-5	N-2-5	75.2667	1108890
24HR100YR	B-2-5	N-2-5	75.5167	1108890
24HR100YR	B-2-5	N-2-5	75.7667	1108890
24HR100YR	B-2-5	N-2-5	76.0167	1108890
24HR100YR	B-2-5	N-2-5	76.2667	1108890
24HR100YR	B-2-5	N-2-5	76.5167	1108890
24HR100YR	B-2-5	N-2-5	76.7667	1108890
24HR100YR	B-2-5	N-2-5	77.0167	1108890
24HR100YR	B-2-5	N-2-5	77.2667	1108890
24HR100YR	B-2-5	N-2-5	77.5167	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	77.7667	1108890
24HR100YR	B-2-5	N-2-5	78.0167	1108890
24HR100YR	B-2-5	N-2-5	78.2667	1108890
24HR100YR	B-2-5	N-2-5	78.5167	1108890
24HR100YR	B-2-5	N-2-5	78.7667	1108890
24HR100YR	B-2-5	N-2-5	79.0167	1108890
24HR100YR	B-2-5	N-2-5	79.2667	1108890
24HR100YR	B-2-5	N-2-5	79.5167	1108890
24HR100YR	B-2-5	N-2-5	79.7667	1108890
24HR100YR	B-2-5	N-2-5	80.0167	1108890
24HR100YR	B-2-5	N-2-5	80.2667	1108890
24HR100YR	B-2-5	N-2-5	80.5167	1108890
24HR100YR	B-2-5	N-2-5	80.7667	1108890
24HR100YR	B-2-5	N-2-5	81.0167	1108890
24HR100YR	B-2-5	N-2-5	81.2667	1108890
24HR100YR	B-2-5	N-2-5	81.5167	1108890
24HR100YR	B-2-5	N-2-5	81.7667	1108890
24HR100YR	B-2-5	N-2-5	82.0167	1108890
24HR100YR	B-2-5	N-2-5	82.2667	1108890
24HR100YR	B-2-5	N-2-5	82.5167	1108890
24HR100YR	B-2-5	N-2-5	82.7667	1108890
24HR100YR	B-2-5	N-2-5	83.0167	1108890
24HR100YR	B-2-5	N-2-5	83.2667	1108890
24HR100YR	B-2-5	N-2-5	83.5167	1108890
24HR100YR	B-2-5	N-2-5	83.7667	1108890
24HR100YR	B-2-5	N-2-5	84.0167	1108890
24HR100YR	B-2-5	N-2-5	84.2667	1108890
24HR100YR	B-2-5	N-2-5	84.5167	1108890
24HR100YR	B-2-5	N-2-5	84.7667	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	85.0167	1108890
24HR100YR	B-2-5	N-2-5	85.2667	1108890
24HR100YR	B-2-5	N-2-5	85.5167	1108890
24HR100YR	B-2-5	N-2-5	85.7667	1108890
24HR100YR	B-2-5	N-2-5	86.0167	1108890
24HR100YR	B-2-5	N-2-5	86.2667	1108890
24HR100YR	B-2-5	N-2-5	86.5167	1108890
24HR100YR	B-2-5	N-2-5	86.7667	1108890
24HR100YR	B-2-5	N-2-5	87.0167	1108890
24HR100YR	B-2-5	N-2-5	87.2667	1108890
24HR100YR	B-2-5	N-2-5	87.5167	1108890
24HR100YR	B-2-5	N-2-5	87.7667	1108890
24HR100YR	B-2-5	N-2-5	88.0167	1108890
24HR100YR	B-2-5	N-2-5	88.2667	1108890
24HR100YR	B-2-5	N-2-5	88.5167	1108890
24HR100YR	B-2-5	N-2-5	88.7667	1108890
24HR100YR	B-2-5	N-2-5	89.0167	1108890
24HR100YR	B-2-5	N-2-5	89.2667	1108890
24HR100YR	B-2-5	N-2-5	89.5167	1108890
24HR100YR	B-2-5	N-2-5	89.7667	1108890
24HR100YR	B-2-5	N-2-5	90.0167	1108890
24HR100YR	B-2-5	N-2-5	90.2667	1108890
24HR100YR	B-2-5	N-2-5	90.5167	1108890
24HR100YR	B-2-5	N-2-5	90.7667	1108890
24HR100YR	B-2-5	N-2-5	91.0167	1108890
24HR100YR	B-2-5	N-2-5	91.2667	1108890
24HR100YR	B-2-5	N-2-5	91.5167	1108890
24HR100YR	B-2-5	N-2-5	91.7667	1108890
24HR100YR	B-2-5	N-2-5	92.0167	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	92.2667	1108890
24HR100YR	B-2-5	N-2-5	92.5167	1108890
24HR100YR	B-2-5	N-2-5	92.7667	1108890
24HR100YR	B-2-5	N-2-5	93.0167	1108890
24HR100YR	B-2-5	N-2-5	93.2667	1108890
24HR100YR	B-2-5	N-2-5	93.5167	1108890
24HR100YR	B-2-5	N-2-5	93.7667	1108890
24HR100YR	B-2-5	N-2-5	94.0167	1108890
24HR100YR	B-2-5	N-2-5	94.2667	1108890
24HR100YR	B-2-5	N-2-5	94.5167	1108890
24HR100YR	B-2-5	N-2-5	94.7667	1108890
24HR100YR	B-2-5	N-2-5	95.0167	1108890
24HR100YR	B-2-5	N-2-5	95.2667	1108890
24HR100YR	B-2-5	N-2-5	95.5167	1108890
24HR100YR	B-2-5	N-2-5	95.7667	1108890
24HR100YR	B-2-5	N-2-5	96.0167	1108890
24HR100YR	B-2-5	N-2-5	96.2667	1108890
24HR100YR	B-2-5	N-2-5	96.5167	1108890
24HR100YR	B-2-5	N-2-5	96.7667	1108890
24HR100YR	B-2-5	N-2-5	97.0167	1108890
24HR100YR	B-2-5	N-2-5	97.2667	1108890
24HR100YR	B-2-5	N-2-5	97.5167	1108890
24HR100YR	B-2-5	N-2-5	97.7667	1108890
24HR100YR	B-2-5	N-2-5	98.0167	1108890
24HR100YR	B-2-5	N-2-5	98.2667	1108890
24HR100YR	B-2-5	N-2-5	98.5167	1108890
24HR100YR	B-2-5	N-2-5	98.7667	1108890
24HR100YR	B-2-5	N-2-5	99.0167	1108890
24HR100YR	B-2-5	N-2-5	99.2667	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	99.5167	1108890
24HR100YR	B-2-5	N-2-5	99.7667	1108890
24HR100YR	B-2-5	N-2-5	100.0167	1108890
24HR100YR	B-2-5	N-2-5	100.2667	1108890
24HR100YR	B-2-5	N-2-5	100.5167	1108890
24HR100YR	B-2-5	N-2-5	100.7667	1108890
24HR100YR	B-2-5	N-2-5	101.0167	1108890
24HR100YR	B-2-5	N-2-5	101.2667	1108890
24HR100YR	B-2-5	N-2-5	101.5167	1108890
24HR100YR	B-2-5	N-2-5	101.7667	1108890
24HR100YR	B-2-5	N-2-5	102.0167	1108890
24HR100YR	B-2-5	N-2-5	102.2667	1108890
24HR100YR	B-2-5	N-2-5	102.5167	1108890
24HR100YR	B-2-5	N-2-5	102.7667	1108890
24HR100YR	B-2-5	N-2-5	103.0167	1108890
24HR100YR	B-2-5	N-2-5	103.2667	1108890
24HR100YR	B-2-5	N-2-5	103.5167	1108890
24HR100YR	B-2-5	N-2-5	103.7667	1108890
24HR100YR	B-2-5	N-2-5	104.0167	1108890
24HR100YR	B-2-5	N-2-5	104.2667	1108890
24HR100YR	B-2-5	N-2-5	104.5167	1108890
24HR100YR	B-2-5	N-2-5	104.7667	1108890
24HR100YR	B-2-5	N-2-5	105.0167	1108890
24HR100YR	B-2-5	N-2-5	105.2667	1108890
24HR100YR	B-2-5	N-2-5	105.5167	1108890
24HR100YR	B-2-5	N-2-5	105.7667	1108890
24HR100YR	B-2-5	N-2-5	106.0167	1108890
24HR100YR	B-2-5	N-2-5	106.2667	1108890
24HR100YR	B-2-5	N-2-5	106.5167	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	106.7667	1108890
24HR100YR	B-2-5	N-2-5	107.0167	1108890
24HR100YR	B-2-5	N-2-5	107.2667	1108890
24HR100YR	B-2-5	N-2-5	107.5167	1108890
24HR100YR	B-2-5	N-2-5	107.7667	1108890
24HR100YR	B-2-5	N-2-5	108.0167	1108890
24HR100YR	B-2-5	N-2-5	108.2667	1108890
24HR100YR	B-2-5	N-2-5	108.5167	1108890
24HR100YR	B-2-5	N-2-5	108.7667	1108890
24HR100YR	B-2-5	N-2-5	109.0167	1108890
24HR100YR	B-2-5	N-2-5	109.2667	1108890
24HR100YR	B-2-5	N-2-5	109.5167	1108890
24HR100YR	B-2-5	N-2-5	109.7667	1108890
24HR100YR	B-2-5	N-2-5	110.0167	1108890
24HR100YR	B-2-5	N-2-5	110.2667	1108890
24HR100YR	B-2-5	N-2-5	110.5167	1108890
24HR100YR	B-2-5	N-2-5	110.7667	1108890
24HR100YR	B-2-5	N-2-5	111.0167	1108890
24HR100YR	B-2-5	N-2-5	111.2667	1108890
24HR100YR	B-2-5	N-2-5	111.5167	1108890
24HR100YR	B-2-5	N-2-5	111.7667	1108890
24HR100YR	B-2-5	N-2-5	112.0167	1108890
24HR100YR	B-2-5	N-2-5	112.2667	1108890
24HR100YR	B-2-5	N-2-5	112.5167	1108890
24HR100YR	B-2-5	N-2-5	112.7667	1108890
24HR100YR	B-2-5	N-2-5	113.0167	1108890
24HR100YR	B-2-5	N-2-5	113.2667	1108890
24HR100YR	B-2-5	N-2-5	113.5167	1108890
24HR100YR	B-2-5	N-2-5	113.7667	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	114.0167	1108890
24HR100YR	B-2-5	N-2-5	114.2667	1108890
24HR100YR	B-2-5	N-2-5	114.5167	1108890
24HR100YR	B-2-5	N-2-5	114.7667	1108890
24HR100YR	B-2-5	N-2-5	115.0167	1108890
24HR100YR	B-2-5	N-2-5	115.2667	1108890
24HR100YR	B-2-5	N-2-5	115.5167	1108890
24HR100YR	B-2-5	N-2-5	115.7667	1108890
24HR100YR	B-2-5	N-2-5	116.0167	1108890
24HR100YR	B-2-5	N-2-5	116.2667	1108890
24HR100YR	B-2-5	N-2-5	116.5167	1108890
24HR100YR	B-2-5	N-2-5	116.7667	1108890
24HR100YR	B-2-5	N-2-5	117.0167	1108890
24HR100YR	B-2-5	N-2-5	117.2667	1108890
24HR100YR	B-2-5	N-2-5	117.5167	1108890
24HR100YR	B-2-5	N-2-5	117.7667	1108890
24HR100YR	B-2-5	N-2-5	118.0167	1108890
24HR100YR	B-2-5	N-2-5	118.2667	1108890
24HR100YR	B-2-5	N-2-5	118.5167	1108890
24HR100YR	B-2-5	N-2-5	118.7667	1108890
24HR100YR	B-2-5	N-2-5	119.0167	1108890
24HR100YR	B-2-5	N-2-5	119.2667	1108890
24HR100YR	B-2-5	N-2-5	119.5167	1108890
24HR100YR	B-2-5	N-2-5	119.7667	1108890
24HR100YR	B-2-5	N-2-5	120.0167	1108890
24HR100YR	B-2-5	N-2-5	120.2667	1108890
24HR100YR	B-2-5	N-2-5	120.5167	1108890
24HR100YR	B-2-5	N-2-5	120.7667	1108890
24HR100YR	B-2-5	N-2-5	121.0167	1108890

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-5	N-2-5	121.2667	1108890
24HR100YR	B-2-5	N-2-5	121.5167	1108890
24HR100YR	B-2-5	N-2-5	121.7667	1108890
24HR100YR	B-2-5	N-2-5	122.0167	1108890
24HR100YR	B-2-5	N-2-5	122.2667	1108890
24HR100YR	B-2-5	N-2-5	122.5167	1108890
24HR100YR	B-2-5	N-2-5	122.7667	1108890
24HR100YR	B-2-5	N-2-5	123.0167	1108890
24HR100YR	B-2-5	N-2-5	123.2667	1108890
24HR100YR	B-2-5	N-2-5	123.5167	1108890
24HR100YR	B-2-5	N-2-5	123.7667	1108890
24HR100YR	B-2-5	N-2-5	124.0167	1108890
24HR100YR	B-2-5	N-2-5	124.2667	1108890
24HR100YR	B-2-5	N-2-5	124.5167	1108890
24HR100YR	B-2-5	N-2-5	124.7667	1108890
24HR100YR	B-2-5	N-2-5	125.0167	1108890

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Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	0.0000	0
24HR100YR	B-2-6	N-2-6	0.0833	14
24HR100YR	B-2-6	N-2-6	0.1667	113
24HR100YR	B-2-6	N-2-6	0.2667	426
24HR100YR	B-2-6	N-2-6	0.3333	735
24HR100YR	B-2-6	N-2-6	0.4167	1200
24HR100YR	B-2-6	N-2-6	0.5000	1736
24HR100YR	B-2-6	N-2-6	0.5833	2326
24HR100YR	B-2-6	N-2-6	0.6667	2959
24HR100YR	B-2-6	N-2-6	0.7500	3624
24HR100YR	B-2-6	N-2-6	0.8333	4318
24HR100YR	B-2-6	N-2-6	0.9167	5037
24HR100YR	B-2-6	N-2-6	1.0000	5777
24HR100YR	B-2-6	N-2-6	1.0833	6535
24HR100YR	B-2-6	N-2-6	1.1667	7313
24HR100YR	B-2-6	N-2-6	1.2500	8113
24HR100YR	B-2-6	N-2-6	1.3333	8929
24HR100YR	B-2-6	N-2-6	1.4167	9758
24HR100YR	B-2-6	N-2-6	1.5000	10596
24HR100YR	B-2-6	N-2-6	1.6000	11607
24HR100YR	B-2-6	N-2-6	1.6833	12453
24HR100YR	B-2-6	N-2-6	1.7667	13302
24HR100YR	B-2-6	N-2-6	1.8500	14153
24HR100YR	B-2-6	N-2-6	1.9333	15007
24HR100YR	B-2-6	N-2-6	2.0167	15862
24HR100YR	B-2-6	N-2-6	2.1000	16720
24HR100YR	B-2-6	N-2-6	2.1833	17587
24HR100YR	B-2-6	N-2-6	2.2667	18465
24HR100YR	B-2-6	N-2-6	2.3500	19353

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	2.4333	20247
24HR100YR	B-2-6	N-2-6	2.5167	21147
24HR100YR	B-2-6	N-2-6	2.6000	22050
24HR100YR	B-2-6	N-2-6	2.6833	22957
24HR100YR	B-2-6	N-2-6	2.7667	23866
24HR100YR	B-2-6	N-2-6	2.8500	24776
24HR100YR	B-2-6	N-2-6	2.9333	25689
24HR100YR	B-2-6	N-2-6	3.0167	26603
24HR100YR	B-2-6	N-2-6	3.1000	27521
24HR100YR	B-2-6	N-2-6	3.1833	28449
24HR100YR	B-2-6	N-2-6	3.2667	29392
24HR100YR	B-2-6	N-2-6	3.3500	30349
24HR100YR	B-2-6	N-2-6	3.4333	31315
24HR100YR	B-2-6	N-2-6	3.5167	32288
24HR100YR	B-2-6	N-2-6	3.6000	33267
24HR100YR	B-2-6	N-2-6	3.6833	34250
24HR100YR	B-2-6	N-2-6	3.7667	35236
24HR100YR	B-2-6	N-2-6	3.8500	36225
24HR100YR	B-2-6	N-2-6	3.9333	37217
24HR100YR	B-2-6	N-2-6	4.0167	38211
24HR100YR	B-2-6	N-2-6	4.1000	39210
24HR100YR	B-2-6	N-2-6	4.1833	40226
24HR100YR	B-2-6	N-2-6	4.2667	41267
24HR100YR	B-2-6	N-2-6	4.3500	42328
24HR100YR	B-2-6	N-2-6	4.4333	43402
24HR100YR	B-2-6	N-2-6	4.5167	44487
24HR100YR	B-2-6	N-2-6	4.6000	45580
24HR100YR	B-2-6	N-2-6	4.6833	46679
24HR100YR	B-2-6	N-2-6	4.7667	47784

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	4.8500	48893
24HR100YR	B-2-6	N-2-6	4.9333	50005
24HR100YR	B-2-6	N-2-6	5.0167	51121
24HR100YR	B-2-6	N-2-6	5.1000	52241
24HR100YR	B-2-6	N-2-6	5.1833	53372
24HR100YR	B-2-6	N-2-6	5.2667	54516
24HR100YR	B-2-6	N-2-6	5.3500	55672
24HR100YR	B-2-6	N-2-6	5.4333	56835
24HR100YR	B-2-6	N-2-6	5.5167	58004
24HR100YR	B-2-6	N-2-6	5.6000	59177
24HR100YR	B-2-6	N-2-6	5.6833	60353
24HR100YR	B-2-6	N-2-6	5.7667	61533
24HR100YR	B-2-6	N-2-6	5.8500	62714
24HR100YR	B-2-6	N-2-6	5.9333	63898
24HR100YR	B-2-6	N-2-6	6.0167	65083
24HR100YR	B-2-6	N-2-6	6.1000	66275
24HR100YR	B-2-6	N-2-6	6.1833	67495
24HR100YR	B-2-6	N-2-6	6.2667	68751
24HR100YR	B-2-6	N-2-6	6.3500	70038
24HR100YR	B-2-6	N-2-6	6.4333	71347
24HR100YR	B-2-6	N-2-6	6.5167	72673
24HR100YR	B-2-6	N-2-6	6.6000	74011
24HR100YR	B-2-6	N-2-6	6.6833	75359
24HR100YR	B-2-6	N-2-6	6.7667	76716
24HR100YR	B-2-6	N-2-6	6.8500	78079
24HR100YR	B-2-6	N-2-6	6.9333	79448
24HR100YR	B-2-6	N-2-6	7.0167	80823
24HR100YR	B-2-6	N-2-6	7.1000	82207
24HR100YR	B-2-6	N-2-6	7.1833	83620

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	7.2667	85073
24HR100YR	B-2-6	N-2-6	7.3500	86557
24HR100YR	B-2-6	N-2-6	7.4333	88065
24HR100YR	B-2-6	N-2-6	7.5167	89590
24HR100YR	B-2-6	N-2-6	7.6000	91128
24HR100YR	B-2-6	N-2-6	7.6833	92676
24HR100YR	B-2-6	N-2-6	7.7667	94233
24HR100YR	B-2-6	N-2-6	7.8500	95796
24HR100YR	B-2-6	N-2-6	7.9333	97366
24HR100YR	B-2-6	N-2-6	8.0167	98941
24HR100YR	B-2-6	N-2-6	8.1000	100527
24HR100YR	B-2-6	N-2-6	8.1833	102152
24HR100YR	B-2-6	N-2-6	8.2500	103488
24HR100YR	B-2-6	N-2-6	8.3333	105197
24HR100YR	B-2-6	N-2-6	8.4167	106938
24HR100YR	B-2-6	N-2-6	8.5000	108702
24HR100YR	B-2-6	N-2-6	8.5833	110489
24HR100YR	B-2-6	N-2-6	8.6667	112319
24HR100YR	B-2-6	N-2-6	8.7500	114209
24HR100YR	B-2-6	N-2-6	8.8333	116151
24HR100YR	B-2-6	N-2-6	8.9167	118132
24HR100YR	B-2-6	N-2-6	9.0000	120143
24HR100YR	B-2-6	N-2-6	9.0833	122181
24HR100YR	B-2-6	N-2-6	9.1667	124251
24HR100YR	B-2-6	N-2-6	9.2500	126360
24HR100YR	B-2-6	N-2-6	9.3333	128501
24HR100YR	B-2-6	N-2-6	9.4167	130668
24HR100YR	B-2-6	N-2-6	9.5000	132854
24HR100YR	B-2-6	N-2-6	9.5833	135062

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	9.6667	137324
24HR100YR	B-2-6	N-2-6	9.7500	139669
24HR100YR	B-2-6	N-2-6	9.8333	142083
24HR100YR	B-2-6	N-2-6	9.9167	144549
24HR100YR	B-2-6	N-2-6	10.0000	147055
24HR100YR	B-2-6	N-2-6	10.0833	149601
24HR100YR	B-2-6	N-2-6	10.1667	152243
24HR100YR	B-2-6	N-2-6	10.2500	155026
24HR100YR	B-2-6	N-2-6	10.3333	157929
24HR100YR	B-2-6	N-2-6	10.4167	160923
24HR100YR	B-2-6	N-2-6	10.5000	163987
24HR100YR	B-2-6	N-2-6	10.5833	167120
24HR100YR	B-2-6	N-2-6	10.6667	170395
24HR100YR	B-2-6	N-2-6	10.7500	173874
24HR100YR	B-2-6	N-2-6	10.8333	177529
24HR100YR	B-2-6	N-2-6	10.9167	181314
24HR100YR	B-2-6	N-2-6	11.0000	185199
24HR100YR	B-2-6	N-2-6	11.0833	189166
24HR100YR	B-2-6	N-2-6	11.1667	193222
24HR100YR	B-2-6	N-2-6	11.2500	197374
24HR100YR	B-2-6	N-2-6	11.3333	201682
24HR100YR	B-2-6	N-2-6	11.4167	206547
24HR100YR	B-2-6	N-2-6	11.5000	212345
24HR100YR	B-2-6	N-2-6	11.5833	219428
24HR100YR	B-2-6	N-2-6	11.6667	229998
24HR100YR	B-2-6	N-2-6	11.7500	246302
24HR100YR	B-2-6	N-2-6	11.8333	268717
24HR100YR	B-2-6	N-2-6	11.9167	299503
24HR100YR	B-2-6	N-2-6	12.0000	341210

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	12.0833	392477
24HR100YR	B-2-6	N-2-6	12.1667	446779
24HR100YR	B-2-6	N-2-6	12.2500	498192
24HR100YR	B-2-6	N-2-6	12.3333	546403
24HR100YR	B-2-6	N-2-6	12.4167	590614
24HR100YR	B-2-6	N-2-6	12.5000	629669
24HR100YR	B-2-6	N-2-6	12.5833	664441
24HR100YR	B-2-6	N-2-6	12.6667	695491
24HR100YR	B-2-6	N-2-6	12.7500	722977
24HR100YR	B-2-6	N-2-6	12.8333	747391
24HR100YR	B-2-6	N-2-6	12.9167	769106
24HR100YR	B-2-6	N-2-6	13.0000	788333
24HR100YR	B-2-6	N-2-6	13.0833	805353
24HR100YR	B-2-6	N-2-6	13.1667	820406
24HR100YR	B-2-6	N-2-6	13.2500	833719
24HR100YR	B-2-6	N-2-6	13.3333	845567
24HR100YR	B-2-6	N-2-6	13.4167	856272
24HR100YR	B-2-6	N-2-6	13.5000	866156
24HR100YR	B-2-6	N-2-6	13.5833	875475
24HR100YR	B-2-6	N-2-6	13.6667	884222
24HR100YR	B-2-6	N-2-6	13.7500	892378
24HR100YR	B-2-6	N-2-6	13.8333	900093
24HR100YR	B-2-6	N-2-6	13.9167	907492
24HR100YR	B-2-6	N-2-6	14.0000	914659
24HR100YR	B-2-6	N-2-6	14.0833	921651
24HR100YR	B-2-6	N-2-6	14.1667	928429
24HR100YR	B-2-6	N-2-6	14.2500	934956
24HR100YR	B-2-6	N-2-6	14.3333	941277
24HR100YR	B-2-6	N-2-6	14.4167	947444

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	14.5000	953493
24HR100YR	B-2-6	N-2-6	14.5833	959440
24HR100YR	B-2-6	N-2-6	14.6667	965226
24HR100YR	B-2-6	N-2-6	14.7500	970797
24HR100YR	B-2-6	N-2-6	14.8333	976189
24HR100YR	B-2-6	N-2-6	14.9167	981448
24HR100YR	B-2-6	N-2-6	15.0000	986608
24HR100YR	B-2-6	N-2-6	15.0833	991690
24HR100YR	B-2-6	N-2-6	15.1667	996685
24HR100YR	B-2-6	N-2-6	15.2500	1001583
24HR100YR	B-2-6	N-2-6	15.3333	1006401
24HR100YR	B-2-6	N-2-6	15.4167	1011158
24HR100YR	B-2-6	N-2-6	15.5000	1015869
24HR100YR	B-2-6	N-2-6	15.5833	1020536
24HR100YR	B-2-6	N-2-6	15.6667	1025112
24HR100YR	B-2-6	N-2-6	15.7500	1029557
24HR100YR	B-2-6	N-2-6	15.8333	1033892
24HR100YR	B-2-6	N-2-6	15.9167	1038147
24HR100YR	B-2-6	N-2-6	16.0000	1042342
24HR100YR	B-2-6	N-2-6	16.0833	1046488
24HR100YR	B-2-6	N-2-6	16.1667	1050569
24HR100YR	B-2-6	N-2-6	16.2500	1054568
24HR100YR	B-2-6	N-2-6	16.3333	1058499
24HR100YR	B-2-6	N-2-6	16.4167	1062377
24HR100YR	B-2-6	N-2-6	16.5000	1066216
24HR100YR	B-2-6	N-2-6	16.5833	1070020
24HR100YR	B-2-6	N-2-6	16.6667	1073768
24HR100YR	B-2-6	N-2-6	16.7500	1077442
24HR100YR	B-2-6	N-2-6	16.8333	1081054

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	16.9167	1084621
24HR100YR	B-2-6	N-2-6	17.0000	1088155
24HR100YR	B-2-6	N-2-6	17.0833	1091664
24HR100YR	B-2-6	N-2-6	17.1667	1095154
24HR100YR	B-2-6	N-2-6	17.2500	1098631
24HR100YR	B-2-6	N-2-6	17.3333	1102098
24HR100YR	B-2-6	N-2-6	17.4167	1105556
24HR100YR	B-2-6	N-2-6	17.5000	1109008
24HR100YR	B-2-6	N-2-6	17.5833	1112446
24HR100YR	B-2-6	N-2-6	17.6667	1115814
24HR100YR	B-2-6	N-2-6	17.7500	1119065
24HR100YR	B-2-6	N-2-6	17.8333	1122217
24HR100YR	B-2-6	N-2-6	17.9167	1125296
24HR100YR	B-2-6	N-2-6	18.0000	1128322
24HR100YR	B-2-6	N-2-6	18.0833	1131313
24HR100YR	B-2-6	N-2-6	18.1667	1134307
24HR100YR	B-2-6	N-2-6	18.2500	1137336
24HR100YR	B-2-6	N-2-6	18.3333	1140395
24HR100YR	B-2-6	N-2-6	18.4167	1143473
24HR100YR	B-2-6	N-2-6	18.5000	1146566
24HR100YR	B-2-6	N-2-6	18.5833	1149658
24HR100YR	B-2-6	N-2-6	18.6667	1152690
24HR100YR	B-2-6	N-2-6	18.7500	1155612
24HR100YR	B-2-6	N-2-6	18.8333	1158442
24HR100YR	B-2-6	N-2-6	18.9167	1161206
24HR100YR	B-2-6	N-2-6	19.0000	1163923
24HR100YR	B-2-6	N-2-6	19.0833	1166609
24HR100YR	B-2-6	N-2-6	19.1667	1169304
24HR100YR	B-2-6	N-2-6	19.2500	1172037

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	19.3333	1174803
24HR100YR	B-2-6	N-2-6	19.4167	1177589
24HR100YR	B-2-6	N-2-6	19.5000	1180390
24HR100YR	B-2-6	N-2-6	19.5833	1183196
24HR100YR	B-2-6	N-2-6	19.6667	1185976
24HR100YR	B-2-6	N-2-6	19.7500	1188705
24HR100YR	B-2-6	N-2-6	19.8333	1191390
24HR100YR	B-2-6	N-2-6	19.9167	1194047
24HR100YR	B-2-6	N-2-6	20.0000	1196684
24HR100YR	B-2-6	N-2-6	20.0833	1199301
24HR100YR	B-2-6	N-2-6	20.1667	1201874
24HR100YR	B-2-6	N-2-6	20.2500	1204378
24HR100YR	B-2-6	N-2-6	20.3333	1206824
24HR100YR	B-2-6	N-2-6	20.4167	1209225
24HR100YR	B-2-6	N-2-6	20.5000	1211593
24HR100YR	B-2-6	N-2-6	20.5833	1213933
24HR100YR	B-2-6	N-2-6	20.6667	1216252
24HR100YR	B-2-6	N-2-6	20.7500	1218556
24HR100YR	B-2-6	N-2-6	20.8333	1220846
24HR100YR	B-2-6	N-2-6	20.9167	1223127
24HR100YR	B-2-6	N-2-6	21.0000	1225399
24HR100YR	B-2-6	N-2-6	21.0833	1227665
24HR100YR	B-2-6	N-2-6	21.1667	1229927
24HR100YR	B-2-6	N-2-6	21.2500	1232187
24HR100YR	B-2-6	N-2-6	21.3333	1234446
24HR100YR	B-2-6	N-2-6	21.4167	1236704
24HR100YR	B-2-6	N-2-6	21.5000	1238962
24HR100YR	B-2-6	N-2-6	21.5833	1241221
24HR100YR	B-2-6	N-2-6	21.6667	1243481

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	21.7500	1245742
24HR100YR	B-2-6	N-2-6	21.8333	1248005
24HR100YR	B-2-6	N-2-6	21.9167	1250268
24HR100YR	B-2-6	N-2-6	22.0000	1252532
24HR100YR	B-2-6	N-2-6	22.0833	1254798
24HR100YR	B-2-6	N-2-6	22.1667	1257065
24HR100YR	B-2-6	N-2-6	22.2500	1259333
24HR100YR	B-2-6	N-2-6	22.3333	1261602
24HR100YR	B-2-6	N-2-6	22.4167	1263873
24HR100YR	B-2-6	N-2-6	22.5000	1266144
24HR100YR	B-2-6	N-2-6	22.5833	1268412
24HR100YR	B-2-6	N-2-6	22.6667	1270646
24HR100YR	B-2-6	N-2-6	22.7500	1272820
24HR100YR	B-2-6	N-2-6	22.8333	1274945
24HR100YR	B-2-6	N-2-6	22.9167	1277033
24HR100YR	B-2-6	N-2-6	23.0000	1279093
24HR100YR	B-2-6	N-2-6	23.0833	1281132
24HR100YR	B-2-6	N-2-6	23.1667	1283154
24HR100YR	B-2-6	N-2-6	23.2500	1285163
24HR100YR	B-2-6	N-2-6	23.3333	1287159
24HR100YR	B-2-6	N-2-6	23.4167	1289146
24HR100YR	B-2-6	N-2-6	23.5000	1291124
24HR100YR	B-2-6	N-2-6	23.5833	1293091
24HR100YR	B-2-6	N-2-6	23.6667	1295017
24HR100YR	B-2-6	N-2-6	23.7500	1296880
24HR100YR	B-2-6	N-2-6	23.8500	1299047
24HR100YR	B-2-6	N-2-6	23.9333	1300811
24HR100YR	B-2-6	N-2-6	24.0167	1302547
24HR100YR	B-2-6	N-2-6	24.1000	1304215

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	24.1833	1305651
24HR100YR	B-2-6	N-2-6	24.2667	1306768
24HR100YR	B-2-6	N-2-6	24.3500	1307628
24HR100YR	B-2-6	N-2-6	24.4333	1308300
24HR100YR	B-2-6	N-2-6	24.5167	1308826
24HR100YR	B-2-6	N-2-6	24.6000	1309239
24HR100YR	B-2-6	N-2-6	24.6833	1309564
24HR100YR	B-2-6	N-2-6	24.7667	1309820
24HR100YR	B-2-6	N-2-6	24.8500	1310015
24HR100YR	B-2-6	N-2-6	24.9333	1310160
24HR100YR	B-2-6	N-2-6	25.0167	1310262
24HR100YR	B-2-6	N-2-6	25.1000	1310330
24HR100YR	B-2-6	N-2-6	25.1833	1310374
24HR100YR	B-2-6	N-2-6	25.2667	1310400
24HR100YR	B-2-6	N-2-6	25.3500	1310413
24HR100YR	B-2-6	N-2-6	25.4333	1310417
24HR100YR	B-2-6	N-2-6	25.5167	1310418
24HR100YR	B-2-6	N-2-6	25.6000	1310418
24HR100YR	B-2-6	N-2-6	25.6833	1310418
24HR100YR	B-2-6	N-2-6	25.7667	1310418
24HR100YR	B-2-6	N-2-6	25.8500	1310418
24HR100YR	B-2-6	N-2-6	25.9333	1310418
24HR100YR	B-2-6	N-2-6	26.0167	1310418
24HR100YR	B-2-6	N-2-6	26.1000	1310418
24HR100YR	B-2-6	N-2-6	26.1833	1310418
24HR100YR	B-2-6	N-2-6	26.2667	1310418
24HR100YR	B-2-6	N-2-6	26.3500	1310418
24HR100YR	B-2-6	N-2-6	26.4333	1310418
24HR100YR	B-2-6	N-2-6	26.5167	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	26.6000	1310418
24HR100YR	B-2-6	N-2-6	26.6833	1310418
24HR100YR	B-2-6	N-2-6	26.7667	1310418
24HR100YR	B-2-6	N-2-6	26.8500	1310418
24HR100YR	B-2-6	N-2-6	26.9333	1310418
24HR100YR	B-2-6	N-2-6	27.0167	1310418
24HR100YR	B-2-6	N-2-6	27.1000	1310418
24HR100YR	B-2-6	N-2-6	27.1833	1310418
24HR100YR	B-2-6	N-2-6	27.2667	1310418
24HR100YR	B-2-6	N-2-6	27.3500	1310418
24HR100YR	B-2-6	N-2-6	27.4333	1310418
24HR100YR	B-2-6	N-2-6	27.5167	1310418
24HR100YR	B-2-6	N-2-6	27.6000	1310418
24HR100YR	B-2-6	N-2-6	27.6833	1310418
24HR100YR	B-2-6	N-2-6	27.7667	1310418
24HR100YR	B-2-6	N-2-6	27.8500	1310418
24HR100YR	B-2-6	N-2-6	27.9333	1310418
24HR100YR	B-2-6	N-2-6	28.0167	1310418
24HR100YR	B-2-6	N-2-6	28.1000	1310418
24HR100YR	B-2-6	N-2-6	28.1833	1310418
24HR100YR	B-2-6	N-2-6	28.2667	1310418
24HR100YR	B-2-6	N-2-6	28.3500	1310418
24HR100YR	B-2-6	N-2-6	28.4333	1310418
24HR100YR	B-2-6	N-2-6	28.5167	1310418
24HR100YR	B-2-6	N-2-6	28.6000	1310418
24HR100YR	B-2-6	N-2-6	28.6833	1310418
24HR100YR	B-2-6	N-2-6	28.7667	1310418
24HR100YR	B-2-6	N-2-6	28.8500	1310418
24HR100YR	B-2-6	N-2-6	28.9333	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	29.0167	1310418
24HR100YR	B-2-6	N-2-6	29.1000	1310418
24HR100YR	B-2-6	N-2-6	29.1833	1310418
24HR100YR	B-2-6	N-2-6	29.2667	1310418
24HR100YR	B-2-6	N-2-6	29.3500	1310418
24HR100YR	B-2-6	N-2-6	29.4333	1310418
24HR100YR	B-2-6	N-2-6	29.5167	1310418
24HR100YR	B-2-6	N-2-6	29.6000	1310418
24HR100YR	B-2-6	N-2-6	29.6833	1310418
24HR100YR	B-2-6	N-2-6	29.7667	1310418
24HR100YR	B-2-6	N-2-6	29.8500	1310418
24HR100YR	B-2-6	N-2-6	29.9333	1310418
24HR100YR	B-2-6	N-2-6	30.0167	1310418
24HR100YR	B-2-6	N-2-6	30.2667	1310418
24HR100YR	B-2-6	N-2-6	30.5167	1310418
24HR100YR	B-2-6	N-2-6	30.7667	1310418
24HR100YR	B-2-6	N-2-6	31.0167	1310418
24HR100YR	B-2-6	N-2-6	31.2667	1310418
24HR100YR	B-2-6	N-2-6	31.5167	1310418
24HR100YR	B-2-6	N-2-6	31.7667	1310418
24HR100YR	B-2-6	N-2-6	32.0167	1310418
24HR100YR	B-2-6	N-2-6	32.2667	1310418
24HR100YR	B-2-6	N-2-6	32.5167	1310418
24HR100YR	B-2-6	N-2-6	32.7667	1310418
24HR100YR	B-2-6	N-2-6	33.0167	1310418
24HR100YR	B-2-6	N-2-6	33.2667	1310418
24HR100YR	B-2-6	N-2-6	33.5167	1310418
24HR100YR	B-2-6	N-2-6	33.7667	1310418
24HR100YR	B-2-6	N-2-6	34.0167	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	34.2667	1310418
24HR100YR	B-2-6	N-2-6	34.5167	1310418
24HR100YR	B-2-6	N-2-6	34.7667	1310418
24HR100YR	B-2-6	N-2-6	35.0167	1310418
24HR100YR	B-2-6	N-2-6	35.2667	1310418
24HR100YR	B-2-6	N-2-6	35.5167	1310418
24HR100YR	B-2-6	N-2-6	35.7667	1310418
24HR100YR	B-2-6	N-2-6	36.0167	1310418
24HR100YR	B-2-6	N-2-6	36.2667	1310418
24HR100YR	B-2-6	N-2-6	36.5167	1310418
24HR100YR	B-2-6	N-2-6	36.7667	1310418
24HR100YR	B-2-6	N-2-6	37.0167	1310418
24HR100YR	B-2-6	N-2-6	37.2667	1310418
24HR100YR	B-2-6	N-2-6	37.5167	1310418
24HR100YR	B-2-6	N-2-6	37.7667	1310418
24HR100YR	B-2-6	N-2-6	38.0167	1310418
24HR100YR	B-2-6	N-2-6	38.2667	1310418
24HR100YR	B-2-6	N-2-6	38.5167	1310418
24HR100YR	B-2-6	N-2-6	38.7667	1310418
24HR100YR	B-2-6	N-2-6	39.0167	1310418
24HR100YR	B-2-6	N-2-6	39.2667	1310418
24HR100YR	B-2-6	N-2-6	39.5167	1310418
24HR100YR	B-2-6	N-2-6	39.7667	1310418
24HR100YR	B-2-6	N-2-6	40.0167	1310418
24HR100YR	B-2-6	N-2-6	40.2667	1310418
24HR100YR	B-2-6	N-2-6	40.5167	1310418
24HR100YR	B-2-6	N-2-6	40.7667	1310418
24HR100YR	B-2-6	N-2-6	41.0167	1310418
24HR100YR	B-2-6	N-2-6	41.2667	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	41.5167	1310418
24HR100YR	B-2-6	N-2-6	41.7667	1310418
24HR100YR	B-2-6	N-2-6	42.0167	1310418
24HR100YR	B-2-6	N-2-6	42.2667	1310418
24HR100YR	B-2-6	N-2-6	42.5167	1310418
24HR100YR	B-2-6	N-2-6	42.7667	1310418
24HR100YR	B-2-6	N-2-6	43.0167	1310418
24HR100YR	B-2-6	N-2-6	43.2667	1310418
24HR100YR	B-2-6	N-2-6	43.5167	1310418
24HR100YR	B-2-6	N-2-6	43.7667	1310418
24HR100YR	B-2-6	N-2-6	44.0167	1310418
24HR100YR	B-2-6	N-2-6	44.2667	1310418
24HR100YR	B-2-6	N-2-6	44.5167	1310418
24HR100YR	B-2-6	N-2-6	44.7667	1310418
24HR100YR	B-2-6	N-2-6	45.0167	1310418
24HR100YR	B-2-6	N-2-6	45.2667	1310418
24HR100YR	B-2-6	N-2-6	45.5167	1310418
24HR100YR	B-2-6	N-2-6	45.7667	1310418
24HR100YR	B-2-6	N-2-6	46.0167	1310418
24HR100YR	B-2-6	N-2-6	46.2667	1310418
24HR100YR	B-2-6	N-2-6	46.5167	1310418
24HR100YR	B-2-6	N-2-6	46.7667	1310418
24HR100YR	B-2-6	N-2-6	47.0167	1310418
24HR100YR	B-2-6	N-2-6	47.2667	1310418
24HR100YR	B-2-6	N-2-6	47.5167	1310418
24HR100YR	B-2-6	N-2-6	47.7667	1310418
24HR100YR	B-2-6	N-2-6	48.0167	1310418
24HR100YR	B-2-6	N-2-6	48.2667	1310418
24HR100YR	B-2-6	N-2-6	48.5167	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	48.7667	1310418
24HR100YR	B-2-6	N-2-6	49.0167	1310418
24HR100YR	B-2-6	N-2-6	49.2667	1310418
24HR100YR	B-2-6	N-2-6	49.5167	1310418
24HR100YR	B-2-6	N-2-6	49.7667	1310418
24HR100YR	B-2-6	N-2-6	50.0167	1310418
24HR100YR	B-2-6	N-2-6	50.2667	1310418
24HR100YR	B-2-6	N-2-6	50.5167	1310418
24HR100YR	B-2-6	N-2-6	50.7667	1310418
24HR100YR	B-2-6	N-2-6	51.0167	1310418
24HR100YR	B-2-6	N-2-6	51.2667	1310418
24HR100YR	B-2-6	N-2-6	51.5167	1310418
24HR100YR	B-2-6	N-2-6	51.7667	1310418
24HR100YR	B-2-6	N-2-6	52.0167	1310418
24HR100YR	B-2-6	N-2-6	52.2667	1310418
24HR100YR	B-2-6	N-2-6	52.5167	1310418
24HR100YR	B-2-6	N-2-6	52.7667	1310418
24HR100YR	B-2-6	N-2-6	53.0167	1310418
24HR100YR	B-2-6	N-2-6	53.2667	1310418
24HR100YR	B-2-6	N-2-6	53.5167	1310418
24HR100YR	B-2-6	N-2-6	53.7667	1310418
24HR100YR	B-2-6	N-2-6	54.0167	1310418
24HR100YR	B-2-6	N-2-6	54.2667	1310418
24HR100YR	B-2-6	N-2-6	54.5167	1310418
24HR100YR	B-2-6	N-2-6	54.7667	1310418
24HR100YR	B-2-6	N-2-6	55.0167	1310418
24HR100YR	B-2-6	N-2-6	55.2667	1310418
24HR100YR	B-2-6	N-2-6	55.5167	1310418
24HR100YR	B-2-6	N-2-6	55.7667	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	56.0167	1310418
24HR100YR	B-2-6	N-2-6	56.2667	1310418
24HR100YR	B-2-6	N-2-6	56.5167	1310418
24HR100YR	B-2-6	N-2-6	56.7667	1310418
24HR100YR	B-2-6	N-2-6	57.0167	1310418
24HR100YR	B-2-6	N-2-6	57.2667	1310418
24HR100YR	B-2-6	N-2-6	57.5167	1310418
24HR100YR	B-2-6	N-2-6	57.7667	1310418
24HR100YR	B-2-6	N-2-6	58.0167	1310418
24HR100YR	B-2-6	N-2-6	58.2667	1310418
24HR100YR	B-2-6	N-2-6	58.5167	1310418
24HR100YR	B-2-6	N-2-6	58.7667	1310418
24HR100YR	B-2-6	N-2-6	59.0167	1310418
24HR100YR	B-2-6	N-2-6	59.2667	1310418
24HR100YR	B-2-6	N-2-6	59.5167	1310418
24HR100YR	B-2-6	N-2-6	59.7667	1310418
24HR100YR	B-2-6	N-2-6	60.0167	1310418
24HR100YR	B-2-6	N-2-6	60.2667	1310418
24HR100YR	B-2-6	N-2-6	60.5167	1310418
24HR100YR	B-2-6	N-2-6	60.7667	1310418
24HR100YR	B-2-6	N-2-6	61.0167	1310418
24HR100YR	B-2-6	N-2-6	61.2667	1310418
24HR100YR	B-2-6	N-2-6	61.5167	1310418
24HR100YR	B-2-6	N-2-6	61.7667	1310418
24HR100YR	B-2-6	N-2-6	62.0167	1310418
24HR100YR	B-2-6	N-2-6	62.2667	1310418
24HR100YR	B-2-6	N-2-6	62.5167	1310418
24HR100YR	B-2-6	N-2-6	62.7667	1310418
24HR100YR	B-2-6	N-2-6	63.0167	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	63.2667	1310418
24HR100YR	B-2-6	N-2-6	63.5167	1310418
24HR100YR	B-2-6	N-2-6	63.7667	1310418
24HR100YR	B-2-6	N-2-6	64.0167	1310418
24HR100YR	B-2-6	N-2-6	64.2667	1310418
24HR100YR	B-2-6	N-2-6	64.5167	1310418
24HR100YR	B-2-6	N-2-6	64.7667	1310418
24HR100YR	B-2-6	N-2-6	65.0167	1310418
24HR100YR	B-2-6	N-2-6	65.2667	1310418
24HR100YR	B-2-6	N-2-6	65.5167	1310418
24HR100YR	B-2-6	N-2-6	65.7667	1310418
24HR100YR	B-2-6	N-2-6	66.0167	1310418
24HR100YR	B-2-6	N-2-6	66.2667	1310418
24HR100YR	B-2-6	N-2-6	66.5167	1310418
24HR100YR	B-2-6	N-2-6	66.7667	1310418
24HR100YR	B-2-6	N-2-6	67.0167	1310418
24HR100YR	B-2-6	N-2-6	67.2667	1310418
24HR100YR	B-2-6	N-2-6	67.5167	1310418
24HR100YR	B-2-6	N-2-6	67.7667	1310418
24HR100YR	B-2-6	N-2-6	68.0167	1310418
24HR100YR	B-2-6	N-2-6	68.2667	1310418
24HR100YR	B-2-6	N-2-6	68.5167	1310418
24HR100YR	B-2-6	N-2-6	68.7667	1310418
24HR100YR	B-2-6	N-2-6	69.0167	1310418
24HR100YR	B-2-6	N-2-6	69.2667	1310418
24HR100YR	B-2-6	N-2-6	69.5167	1310418
24HR100YR	B-2-6	N-2-6	69.7667	1310418
24HR100YR	B-2-6	N-2-6	70.0167	1310418
24HR100YR	B-2-6	N-2-6	70.2667	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	70.5167	1310418
24HR100YR	B-2-6	N-2-6	70.7667	1310418
24HR100YR	B-2-6	N-2-6	71.0167	1310418
24HR100YR	B-2-6	N-2-6	71.2667	1310418
24HR100YR	B-2-6	N-2-6	71.5167	1310418
24HR100YR	B-2-6	N-2-6	71.7667	1310418
24HR100YR	B-2-6	N-2-6	72.0167	1310418
24HR100YR	B-2-6	N-2-6	72.2667	1310418
24HR100YR	B-2-6	N-2-6	72.5167	1310418
24HR100YR	B-2-6	N-2-6	72.7667	1310418
24HR100YR	B-2-6	N-2-6	73.0167	1310418
24HR100YR	B-2-6	N-2-6	73.2667	1310418
24HR100YR	B-2-6	N-2-6	73.5167	1310418
24HR100YR	B-2-6	N-2-6	73.7667	1310418
24HR100YR	B-2-6	N-2-6	74.0167	1310418
24HR100YR	B-2-6	N-2-6	74.2667	1310418
24HR100YR	B-2-6	N-2-6	74.5167	1310418
24HR100YR	B-2-6	N-2-6	74.7667	1310418
24HR100YR	B-2-6	N-2-6	75.0167	1310418
24HR100YR	B-2-6	N-2-6	75.2667	1310418
24HR100YR	B-2-6	N-2-6	75.5167	1310418
24HR100YR	B-2-6	N-2-6	75.7667	1310418
24HR100YR	B-2-6	N-2-6	76.0167	1310418
24HR100YR	B-2-6	N-2-6	76.2667	1310418
24HR100YR	B-2-6	N-2-6	76.5167	1310418
24HR100YR	B-2-6	N-2-6	76.7667	1310418
24HR100YR	B-2-6	N-2-6	77.0167	1310418
24HR100YR	B-2-6	N-2-6	77.2667	1310418
24HR100YR	B-2-6	N-2-6	77.5167	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	77.7667	1310418
24HR100YR	B-2-6	N-2-6	78.0167	1310418
24HR100YR	B-2-6	N-2-6	78.2667	1310418
24HR100YR	B-2-6	N-2-6	78.5167	1310418
24HR100YR	B-2-6	N-2-6	78.7667	1310418
24HR100YR	B-2-6	N-2-6	79.0167	1310418
24HR100YR	B-2-6	N-2-6	79.2667	1310418
24HR100YR	B-2-6	N-2-6	79.5167	1310418
24HR100YR	B-2-6	N-2-6	79.7667	1310418
24HR100YR	B-2-6	N-2-6	80.0167	1310418
24HR100YR	B-2-6	N-2-6	80.2667	1310418
24HR100YR	B-2-6	N-2-6	80.5167	1310418
24HR100YR	B-2-6	N-2-6	80.7667	1310418
24HR100YR	B-2-6	N-2-6	81.0167	1310418
24HR100YR	B-2-6	N-2-6	81.2667	1310418
24HR100YR	B-2-6	N-2-6	81.5167	1310418
24HR100YR	B-2-6	N-2-6	81.7667	1310418
24HR100YR	B-2-6	N-2-6	82.0167	1310418
24HR100YR	B-2-6	N-2-6	82.2667	1310418
24HR100YR	B-2-6	N-2-6	82.5167	1310418
24HR100YR	B-2-6	N-2-6	82.7667	1310418
24HR100YR	B-2-6	N-2-6	83.0167	1310418
24HR100YR	B-2-6	N-2-6	83.2667	1310418
24HR100YR	B-2-6	N-2-6	83.5167	1310418
24HR100YR	B-2-6	N-2-6	83.7667	1310418
24HR100YR	B-2-6	N-2-6	84.0167	1310418
24HR100YR	B-2-6	N-2-6	84.2667	1310418
24HR100YR	B-2-6	N-2-6	84.5167	1310418
24HR100YR	B-2-6	N-2-6	84.7667	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	85.0167	1310418
24HR100YR	B-2-6	N-2-6	85.2667	1310418
24HR100YR	B-2-6	N-2-6	85.5167	1310418
24HR100YR	B-2-6	N-2-6	85.7667	1310418
24HR100YR	B-2-6	N-2-6	86.0167	1310418
24HR100YR	B-2-6	N-2-6	86.2667	1310418
24HR100YR	B-2-6	N-2-6	86.5167	1310418
24HR100YR	B-2-6	N-2-6	86.7667	1310418
24HR100YR	B-2-6	N-2-6	87.0167	1310418
24HR100YR	B-2-6	N-2-6	87.2667	1310418
24HR100YR	B-2-6	N-2-6	87.5167	1310418
24HR100YR	B-2-6	N-2-6	87.7667	1310418
24HR100YR	B-2-6	N-2-6	88.0167	1310418
24HR100YR	B-2-6	N-2-6	88.2667	1310418
24HR100YR	B-2-6	N-2-6	88.5167	1310418
24HR100YR	B-2-6	N-2-6	88.7667	1310418
24HR100YR	B-2-6	N-2-6	89.0167	1310418
24HR100YR	B-2-6	N-2-6	89.2667	1310418
24HR100YR	B-2-6	N-2-6	89.5167	1310418
24HR100YR	B-2-6	N-2-6	89.7667	1310418
24HR100YR	B-2-6	N-2-6	90.0167	1310418
24HR100YR	B-2-6	N-2-6	90.2667	1310418
24HR100YR	B-2-6	N-2-6	90.5167	1310418
24HR100YR	B-2-6	N-2-6	90.7667	1310418
24HR100YR	B-2-6	N-2-6	91.0167	1310418
24HR100YR	B-2-6	N-2-6	91.2667	1310418
24HR100YR	B-2-6	N-2-6	91.5167	1310418
24HR100YR	B-2-6	N-2-6	91.7667	1310418
24HR100YR	B-2-6	N-2-6	92.0167	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	92.2667	1310418
24HR100YR	B-2-6	N-2-6	92.5167	1310418
24HR100YR	B-2-6	N-2-6	92.7667	1310418
24HR100YR	B-2-6	N-2-6	93.0167	1310418
24HR100YR	B-2-6	N-2-6	93.2667	1310418
24HR100YR	B-2-6	N-2-6	93.5167	1310418
24HR100YR	B-2-6	N-2-6	93.7667	1310418
24HR100YR	B-2-6	N-2-6	94.0167	1310418
24HR100YR	B-2-6	N-2-6	94.2667	1310418
24HR100YR	B-2-6	N-2-6	94.5167	1310418
24HR100YR	B-2-6	N-2-6	94.7667	1310418
24HR100YR	B-2-6	N-2-6	95.0167	1310418
24HR100YR	B-2-6	N-2-6	95.2667	1310418
24HR100YR	B-2-6	N-2-6	95.5167	1310418
24HR100YR	B-2-6	N-2-6	95.7667	1310418
24HR100YR	B-2-6	N-2-6	96.0167	1310418
24HR100YR	B-2-6	N-2-6	96.2667	1310418
24HR100YR	B-2-6	N-2-6	96.5167	1310418
24HR100YR	B-2-6	N-2-6	96.7667	1310418
24HR100YR	B-2-6	N-2-6	97.0167	1310418
24HR100YR	B-2-6	N-2-6	97.2667	1310418
24HR100YR	B-2-6	N-2-6	97.5167	1310418
24HR100YR	B-2-6	N-2-6	97.7667	1310418
24HR100YR	B-2-6	N-2-6	98.0167	1310418
24HR100YR	B-2-6	N-2-6	98.2667	1310418
24HR100YR	B-2-6	N-2-6	98.5167	1310418
24HR100YR	B-2-6	N-2-6	98.7667	1310418
24HR100YR	B-2-6	N-2-6	99.0167	1310418
24HR100YR	B-2-6	N-2-6	99.2667	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	99.5167	1310418
24HR100YR	B-2-6	N-2-6	99.7667	1310418
24HR100YR	B-2-6	N-2-6	100.0167	1310418
24HR100YR	B-2-6	N-2-6	100.2667	1310418
24HR100YR	B-2-6	N-2-6	100.5167	1310418
24HR100YR	B-2-6	N-2-6	100.7667	1310418
24HR100YR	B-2-6	N-2-6	101.0167	1310418
24HR100YR	B-2-6	N-2-6	101.2667	1310418
24HR100YR	B-2-6	N-2-6	101.5167	1310418
24HR100YR	B-2-6	N-2-6	101.7667	1310418
24HR100YR	B-2-6	N-2-6	102.0167	1310418
24HR100YR	B-2-6	N-2-6	102.2667	1310418
24HR100YR	B-2-6	N-2-6	102.5167	1310418
24HR100YR	B-2-6	N-2-6	102.7667	1310418
24HR100YR	B-2-6	N-2-6	103.0167	1310418
24HR100YR	B-2-6	N-2-6	103.2667	1310418
24HR100YR	B-2-6	N-2-6	103.5167	1310418
24HR100YR	B-2-6	N-2-6	103.7667	1310418
24HR100YR	B-2-6	N-2-6	104.0167	1310418
24HR100YR	B-2-6	N-2-6	104.2667	1310418
24HR100YR	B-2-6	N-2-6	104.5167	1310418
24HR100YR	B-2-6	N-2-6	104.7667	1310418
24HR100YR	B-2-6	N-2-6	105.0167	1310418
24HR100YR	B-2-6	N-2-6	105.2667	1310418
24HR100YR	B-2-6	N-2-6	105.5167	1310418
24HR100YR	B-2-6	N-2-6	105.7667	1310418
24HR100YR	B-2-6	N-2-6	106.0167	1310418
24HR100YR	B-2-6	N-2-6	106.2667	1310418
24HR100YR	B-2-6	N-2-6	106.5167	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	106.7667	1310418
24HR100YR	B-2-6	N-2-6	107.0167	1310418
24HR100YR	B-2-6	N-2-6	107.2667	1310418
24HR100YR	B-2-6	N-2-6	107.5167	1310418
24HR100YR	B-2-6	N-2-6	107.7667	1310418
24HR100YR	B-2-6	N-2-6	108.0167	1310418
24HR100YR	B-2-6	N-2-6	108.2667	1310418
24HR100YR	B-2-6	N-2-6	108.5167	1310418
24HR100YR	B-2-6	N-2-6	108.7667	1310418
24HR100YR	B-2-6	N-2-6	109.0167	1310418
24HR100YR	B-2-6	N-2-6	109.2667	1310418
24HR100YR	B-2-6	N-2-6	109.5167	1310418
24HR100YR	B-2-6	N-2-6	109.7667	1310418
24HR100YR	B-2-6	N-2-6	110.0167	1310418
24HR100YR	B-2-6	N-2-6	110.2667	1310418
24HR100YR	B-2-6	N-2-6	110.5167	1310418
24HR100YR	B-2-6	N-2-6	110.7667	1310418
24HR100YR	B-2-6	N-2-6	111.0167	1310418
24HR100YR	B-2-6	N-2-6	111.2667	1310418
24HR100YR	B-2-6	N-2-6	111.5167	1310418
24HR100YR	B-2-6	N-2-6	111.7667	1310418
24HR100YR	B-2-6	N-2-6	112.0167	1310418
24HR100YR	B-2-6	N-2-6	112.2667	1310418
24HR100YR	B-2-6	N-2-6	112.5167	1310418
24HR100YR	B-2-6	N-2-6	112.7667	1310418
24HR100YR	B-2-6	N-2-6	113.0167	1310418
24HR100YR	B-2-6	N-2-6	113.2667	1310418
24HR100YR	B-2-6	N-2-6	113.5167	1310418
24HR100YR	B-2-6	N-2-6	113.7667	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	114.0167	1310418
24HR100YR	B-2-6	N-2-6	114.2667	1310418
24HR100YR	B-2-6	N-2-6	114.5167	1310418
24HR100YR	B-2-6	N-2-6	114.7667	1310418
24HR100YR	B-2-6	N-2-6	115.0167	1310418
24HR100YR	B-2-6	N-2-6	115.2667	1310418
24HR100YR	B-2-6	N-2-6	115.5167	1310418
24HR100YR	B-2-6	N-2-6	115.7667	1310418
24HR100YR	B-2-6	N-2-6	116.0167	1310418
24HR100YR	B-2-6	N-2-6	116.2667	1310418
24HR100YR	B-2-6	N-2-6	116.5167	1310418
24HR100YR	B-2-6	N-2-6	116.7667	1310418
24HR100YR	B-2-6	N-2-6	117.0167	1310418
24HR100YR	B-2-6	N-2-6	117.2667	1310418
24HR100YR	B-2-6	N-2-6	117.5167	1310418
24HR100YR	B-2-6	N-2-6	117.7667	1310418
24HR100YR	B-2-6	N-2-6	118.0167	1310418
24HR100YR	B-2-6	N-2-6	118.2667	1310418
24HR100YR	B-2-6	N-2-6	118.5167	1310418
24HR100YR	B-2-6	N-2-6	118.7667	1310418
24HR100YR	B-2-6	N-2-6	119.0167	1310418
24HR100YR	B-2-6	N-2-6	119.2667	1310418
24HR100YR	B-2-6	N-2-6	119.5167	1310418
24HR100YR	B-2-6	N-2-6	119.7667	1310418
24HR100YR	B-2-6	N-2-6	120.0167	1310418
24HR100YR	B-2-6	N-2-6	120.2667	1310418
24HR100YR	B-2-6	N-2-6	120.5167	1310418
24HR100YR	B-2-6	N-2-6	120.7667	1310418
24HR100YR	B-2-6	N-2-6	121.0167	1310418

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-6	N-2-6	121.2667	1310418
24HR100YR	B-2-6	N-2-6	121.5167	1310418
24HR100YR	B-2-6	N-2-6	121.7667	1310418
24HR100YR	B-2-6	N-2-6	122.0167	1310418
24HR100YR	B-2-6	N-2-6	122.2667	1310418
24HR100YR	B-2-6	N-2-6	122.5167	1310418
24HR100YR	B-2-6	N-2-6	122.7667	1310418
24HR100YR	B-2-6	N-2-6	123.0167	1310418
24HR100YR	B-2-6	N-2-6	123.2667	1310418
24HR100YR	B-2-6	N-2-6	123.5167	1310418
24HR100YR	B-2-6	N-2-6	123.7667	1310418
24HR100YR	B-2-6	N-2-6	124.0167	1310418
24HR100YR	B-2-6	N-2-6	124.2667	1310418
24HR100YR	B-2-6	N-2-6	124.5167	1310418
24HR100YR	B-2-6	N-2-6	124.7667	1310418
24HR100YR	B-2-6	N-2-6	125.0167	1310418

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Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	0.0000	0
24HR100YR	B-2-7	N-2-7	0.0833	21
24HR100YR	B-2-7	N-2-7	0.1667	154
24HR100YR	B-2-7	N-2-7	0.2667	459
24HR100YR	B-2-7	N-2-7	0.3333	720
24HR100YR	B-2-7	N-2-7	0.4167	1090
24HR100YR	B-2-7	N-2-7	0.5000	1494
24HR100YR	B-2-7	N-2-7	0.5833	1924
24HR100YR	B-2-7	N-2-7	0.6667	2374
24HR100YR	B-2-7	N-2-7	0.7500	2841
24HR100YR	B-2-7	N-2-7	0.8333	3317
24HR100YR	B-2-7	N-2-7	0.9167	3799
24HR100YR	B-2-7	N-2-7	1.0000	4284
24HR100YR	B-2-7	N-2-7	1.0833	4772
24HR100YR	B-2-7	N-2-7	1.1667	5269
24HR100YR	B-2-7	N-2-7	1.2500	5775
24HR100YR	B-2-7	N-2-7	1.3333	6288
24HR100YR	B-2-7	N-2-7	1.4167	6805
24HR100YR	B-2-7	N-2-7	1.5000	7324
24HR100YR	B-2-7	N-2-7	1.6000	7951
24HR100YR	B-2-7	N-2-7	1.6833	8475
24HR100YR	B-2-7	N-2-7	1.7667	9000
24HR100YR	B-2-7	N-2-7	1.8500	9525
24HR100YR	B-2-7	N-2-7	1.9333	10052
24HR100YR	B-2-7	N-2-7	2.0167	10578
24HR100YR	B-2-7	N-2-7	2.1000	11107
24HR100YR	B-2-7	N-2-7	2.1833	11645
24HR100YR	B-2-7	N-2-7	2.2667	12191
24HR100YR	B-2-7	N-2-7	2.3500	12742

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	2.4333	13297
24HR100YR	B-2-7	N-2-7	2.5167	13854
24HR100YR	B-2-7	N-2-7	2.6000	14412
24HR100YR	B-2-7	N-2-7	2.6833	14972
24HR100YR	B-2-7	N-2-7	2.7667	15533
24HR100YR	B-2-7	N-2-7	2.8500	16095
24HR100YR	B-2-7	N-2-7	2.9333	16657
24HR100YR	B-2-7	N-2-7	3.0167	17220
24HR100YR	B-2-7	N-2-7	3.1000	17785
24HR100YR	B-2-7	N-2-7	3.1833	18363
24HR100YR	B-2-7	N-2-7	3.2667	18951
24HR100YR	B-2-7	N-2-7	3.3500	19547
24HR100YR	B-2-7	N-2-7	3.4333	20147
24HR100YR	B-2-7	N-2-7	3.5167	20751
24HR100YR	B-2-7	N-2-7	3.6000	21358
24HR100YR	B-2-7	N-2-7	3.6833	21967
24HR100YR	B-2-7	N-2-7	3.7667	22577
24HR100YR	B-2-7	N-2-7	3.8500	23188
24HR100YR	B-2-7	N-2-7	3.9333	23800
24HR100YR	B-2-7	N-2-7	4.0167	24412
24HR100YR	B-2-7	N-2-7	4.1000	25030
24HR100YR	B-2-7	N-2-7	4.1833	25667
24HR100YR	B-2-7	N-2-7	4.2667	26321
24HR100YR	B-2-7	N-2-7	4.3500	26985
24HR100YR	B-2-7	N-2-7	4.4333	27657
24HR100YR	B-2-7	N-2-7	4.5167	28333
24HR100YR	B-2-7	N-2-7	4.6000	29013
24HR100YR	B-2-7	N-2-7	4.6833	29697
24HR100YR	B-2-7	N-2-7	4.7667	30383

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	4.8500	31070
24HR100YR	B-2-7	N-2-7	4.9333	31758
24HR100YR	B-2-7	N-2-7	5.0167	32446
24HR100YR	B-2-7	N-2-7	5.1000	33138
24HR100YR	B-2-7	N-2-7	5.1833	33839
24HR100YR	B-2-7	N-2-7	5.2667	34550
24HR100YR	B-2-7	N-2-7	5.3500	35266
24HR100YR	B-2-7	N-2-7	5.4333	35986
24HR100YR	B-2-7	N-2-7	5.5167	36708
24HR100YR	B-2-7	N-2-7	5.6000	37432
24HR100YR	B-2-7	N-2-7	5.6833	38159
24HR100YR	B-2-7	N-2-7	5.7667	38886
24HR100YR	B-2-7	N-2-7	5.8500	39614
24HR100YR	B-2-7	N-2-7	5.9333	40343
24HR100YR	B-2-7	N-2-7	6.0167	41071
24HR100YR	B-2-7	N-2-7	6.1000	41809
24HR100YR	B-2-7	N-2-7	6.1833	42578
24HR100YR	B-2-7	N-2-7	6.2667	43372
24HR100YR	B-2-7	N-2-7	6.3500	44183
24HR100YR	B-2-7	N-2-7	6.4333	45006
24HR100YR	B-2-7	N-2-7	6.5167	45837
24HR100YR	B-2-7	N-2-7	6.6000	46673
24HR100YR	B-2-7	N-2-7	6.6833	47515
24HR100YR	B-2-7	N-2-7	6.7667	48361
24HR100YR	B-2-7	N-2-7	6.8500	49208
24HR100YR	B-2-7	N-2-7	6.9333	50057
24HR100YR	B-2-7	N-2-7	7.0167	50907
24HR100YR	B-2-7	N-2-7	7.1000	51765
24HR100YR	B-2-7	N-2-7	7.1833	52655

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	7.2667	53571
24HR100YR	B-2-7	N-2-7	7.3500	54505
24HR100YR	B-2-7	N-2-7	7.4333	55450
24HR100YR	B-2-7	N-2-7	7.5167	56403
24HR100YR	B-2-7	N-2-7	7.6000	57362
24HR100YR	B-2-7	N-2-7	7.6833	58327
24HR100YR	B-2-7	N-2-7	7.7667	59295
24HR100YR	B-2-7	N-2-7	7.8500	60266
24HR100YR	B-2-7	N-2-7	7.9333	61238
24HR100YR	B-2-7	N-2-7	8.0167	62210
24HR100YR	B-2-7	N-2-7	8.1000	63195
24HR100YR	B-2-7	N-2-7	8.1833	64220
24HR100YR	B-2-7	N-2-7	8.2500	65066
24HR100YR	B-2-7	N-2-7	8.3333	66145
24HR100YR	B-2-7	N-2-7	8.4167	67240
24HR100YR	B-2-7	N-2-7	8.5000	68346
24HR100YR	B-2-7	N-2-7	8.5833	69468
24HR100YR	B-2-7	N-2-7	8.6667	70634
24HR100YR	B-2-7	N-2-7	8.7500	71843
24HR100YR	B-2-7	N-2-7	8.8333	73081
24HR100YR	B-2-7	N-2-7	8.9167	74336
24HR100YR	B-2-7	N-2-7	9.0000	75605
24HR100YR	B-2-7	N-2-7	9.0833	76885
24HR100YR	B-2-7	N-2-7	9.1667	78192
24HR100YR	B-2-7	N-2-7	9.2500	79522
24HR100YR	B-2-7	N-2-7	9.3333	80868
24HR100YR	B-2-7	N-2-7	9.4167	82225
24HR100YR	B-2-7	N-2-7	9.5000	83588
24HR100YR	B-2-7	N-2-7	9.5833	84966

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	9.6667	86403
24HR100YR	B-2-7	N-2-7	9.7500	87900
24HR100YR	B-2-7	N-2-7	9.8333	89434
24HR100YR	B-2-7	N-2-7	9.9167	90995
24HR100YR	B-2-7	N-2-7	10.0000	92573
24HR100YR	B-2-7	N-2-7	10.0833	94182
24HR100YR	B-2-7	N-2-7	10.1667	95894
24HR100YR	B-2-7	N-2-7	10.2500	97709
24HR100YR	B-2-7	N-2-7	10.3333	99591
24HR100YR	B-2-7	N-2-7	10.4167	101517
24HR100YR	B-2-7	N-2-7	10.5000	103473
24HR100YR	B-2-7	N-2-7	10.5833	105476
24HR100YR	B-2-7	N-2-7	10.6667	107626
24HR100YR	B-2-7	N-2-7	10.7500	109922
24HR100YR	B-2-7	N-2-7	10.8333	112312
24HR100YR	B-2-7	N-2-7	10.9167	114766
24HR100YR	B-2-7	N-2-7	11.0000	117261
24HR100YR	B-2-7	N-2-7	11.0833	119795
24HR100YR	B-2-7	N-2-7	11.1667	122390
24HR100YR	B-2-7	N-2-7	11.2500	125040
24HR100YR	B-2-7	N-2-7	11.3333	127848
24HR100YR	B-2-7	N-2-7	11.4167	131342
24HR100YR	B-2-7	N-2-7	11.5000	135605
24HR100YR	B-2-7	N-2-7	11.5833	141157
24HR100YR	B-2-7	N-2-7	11.6667	151148
24HR100YR	B-2-7	N-2-7	11.7500	166322
24HR100YR	B-2-7	N-2-7	11.8333	186802
24HR100YR	B-2-7	N-2-7	11.9167	216541
24HR100YR	B-2-7	N-2-7	12.0000	256313

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	12.0833	302912
24HR100YR	B-2-7	N-2-7	12.1667	347033
24HR100YR	B-2-7	N-2-7	12.2500	386618
24HR100YR	B-2-7	N-2-7	12.3333	423131
24HR100YR	B-2-7	N-2-7	12.4167	454449
24HR100YR	B-2-7	N-2-7	12.5000	481009
24HR100YR	B-2-7	N-2-7	12.5833	503996
24HR100YR	B-2-7	N-2-7	12.6667	523102
24HR100YR	B-2-7	N-2-7	12.7500	538940
24HR100YR	B-2-7	N-2-7	12.8333	552376
24HR100YR	B-2-7	N-2-7	12.9167	563764
24HR100YR	B-2-7	N-2-7	13.0000	573632
24HR100YR	B-2-7	N-2-7	13.0833	582534
24HR100YR	B-2-7	N-2-7	13.1667	590547
24HR100YR	B-2-7	N-2-7	13.2500	597871
24HR100YR	B-2-7	N-2-7	13.3333	604794
24HR100YR	B-2-7	N-2-7	13.4167	611464
24HR100YR	B-2-7	N-2-7	13.5000	617976
24HR100YR	B-2-7	N-2-7	13.5833	624340
24HR100YR	B-2-7	N-2-7	13.6667	630340
24HR100YR	B-2-7	N-2-7	13.7500	635989
24HR100YR	B-2-7	N-2-7	13.8333	641424
24HR100YR	B-2-7	N-2-7	13.9167	646721
24HR100YR	B-2-7	N-2-7	14.0000	651930
24HR100YR	B-2-7	N-2-7	14.0833	657050
24HR100YR	B-2-7	N-2-7	14.1667	661967
24HR100YR	B-2-7	N-2-7	14.2500	666693
24HR100YR	B-2-7	N-2-7	14.3333	671299
24HR100YR	B-2-7	N-2-7	14.4167	675829

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	14.5000	680312
24HR100YR	B-2-7	N-2-7	14.5833	684737
24HR100YR	B-2-7	N-2-7	14.6667	688983
24HR100YR	B-2-7	N-2-7	14.7500	693054
24HR100YR	B-2-7	N-2-7	14.8333	697013
24HR100YR	B-2-7	N-2-7	14.9167	700901
24HR100YR	B-2-7	N-2-7	15.0000	704744
24HR100YR	B-2-7	N-2-7	15.0833	708545
24HR100YR	B-2-7	N-2-7	15.1667	712269
24HR100YR	B-2-7	N-2-7	15.2500	715923
24HR100YR	B-2-7	N-2-7	15.3333	719534
24HR100YR	B-2-7	N-2-7	15.4167	723118
24HR100YR	B-2-7	N-2-7	15.5000	726687
24HR100YR	B-2-7	N-2-7	15.5833	730228
24HR100YR	B-2-7	N-2-7	15.6667	733656
24HR100YR	B-2-7	N-2-7	15.7500	736970
24HR100YR	B-2-7	N-2-7	15.8333	740213
24HR100YR	B-2-7	N-2-7	15.9167	743409
24HR100YR	B-2-7	N-2-7	16.0000	746575
24HR100YR	B-2-7	N-2-7	16.0833	749708
24HR100YR	B-2-7	N-2-7	16.1667	752772
24HR100YR	B-2-7	N-2-7	16.2500	755769
24HR100YR	B-2-7	N-2-7	16.3333	758724
24HR100YR	B-2-7	N-2-7	16.4167	761653
24HR100YR	B-2-7	N-2-7	16.5000	764566
24HR100YR	B-2-7	N-2-7	16.5833	767458
24HR100YR	B-2-7	N-2-7	16.6667	770289
24HR100YR	B-2-7	N-2-7	16.7500	773060
24HR100YR	B-2-7	N-2-7	16.8333	775792

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	16.9167	778500
24HR100YR	B-2-7	N-2-7	17.0000	781193
24HR100YR	B-2-7	N-2-7	17.0833	783875
24HR100YR	B-2-7	N-2-7	17.1667	786550
24HR100YR	B-2-7	N-2-7	17.2500	789220
24HR100YR	B-2-7	N-2-7	17.3333	791887
24HR100YR	B-2-7	N-2-7	17.4167	794555
24HR100YR	B-2-7	N-2-7	17.5000	797224
24HR100YR	B-2-7	N-2-7	17.5833	799874
24HR100YR	B-2-7	N-2-7	17.6667	802416
24HR100YR	B-2-7	N-2-7	17.7500	804845
24HR100YR	B-2-7	N-2-7	17.8333	807204
24HR100YR	B-2-7	N-2-7	17.9167	809515
24HR100YR	B-2-7	N-2-7	18.0000	811795
24HR100YR	B-2-7	N-2-7	18.0833	814060
24HR100YR	B-2-7	N-2-7	18.1667	816363
24HR100YR	B-2-7	N-2-7	18.2500	818710
24HR100YR	B-2-7	N-2-7	18.3333	821087
24HR100YR	B-2-7	N-2-7	18.4167	823484
24HR100YR	B-2-7	N-2-7	18.5000	825898
24HR100YR	B-2-7	N-2-7	18.5833	828306
24HR100YR	B-2-7	N-2-7	18.6667	830613
24HR100YR	B-2-7	N-2-7	18.7500	832814
24HR100YR	B-2-7	N-2-7	18.8333	834947
24HR100YR	B-2-7	N-2-7	18.9167	837034
24HR100YR	B-2-7	N-2-7	19.0000	839090
24HR100YR	B-2-7	N-2-7	19.0833	841132
24HR100YR	B-2-7	N-2-7	19.1667	843211
24HR100YR	B-2-7	N-2-7	19.2500	845335

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	19.3333	847487
24HR100YR	B-2-7	N-2-7	19.4167	849661
24HR100YR	B-2-7	N-2-7	19.5000	851851
24HR100YR	B-2-7	N-2-7	19.5833	854045
24HR100YR	B-2-7	N-2-7	19.6667	856194
24HR100YR	B-2-7	N-2-7	19.7500	858294
24HR100YR	B-2-7	N-2-7	19.8333	860363
24HR100YR	B-2-7	N-2-7	19.9167	862412
24HR100YR	B-2-7	N-2-7	20.0000	864446
24HR100YR	B-2-7	N-2-7	20.0833	866457
24HR100YR	B-2-7	N-2-7	20.1667	868402
24HR100YR	B-2-7	N-2-7	20.2500	870282
24HR100YR	B-2-7	N-2-7	20.3333	872120
24HR100YR	B-2-7	N-2-7	20.4167	873930
24HR100YR	B-2-7	N-2-7	20.5000	875722
24HR100YR	B-2-7	N-2-7	20.5833	877502
24HR100YR	B-2-7	N-2-7	20.6667	879272
24HR100YR	B-2-7	N-2-7	20.7500	881035
24HR100YR	B-2-7	N-2-7	20.8333	882795
24HR100YR	B-2-7	N-2-7	20.9167	884553
24HR100YR	B-2-7	N-2-7	21.0000	886310
24HR100YR	B-2-7	N-2-7	21.0833	888068
24HR100YR	B-2-7	N-2-7	21.1667	889827
24HR100YR	B-2-7	N-2-7	21.2500	891588
24HR100YR	B-2-7	N-2-7	21.3333	893349
24HR100YR	B-2-7	N-2-7	21.4167	895111
24HR100YR	B-2-7	N-2-7	21.5000	896875
24HR100YR	B-2-7	N-2-7	21.5833	898639
24HR100YR	B-2-7	N-2-7	21.6667	900405

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	21.7500	902171
24HR100YR	B-2-7	N-2-7	21.8333	903938
24HR100YR	B-2-7	N-2-7	21.9167	905707
24HR100YR	B-2-7	N-2-7	22.0000	907476
24HR100YR	B-2-7	N-2-7	22.0833	909246
24HR100YR	B-2-7	N-2-7	22.1667	911017
24HR100YR	B-2-7	N-2-7	22.2500	912790
24HR100YR	B-2-7	N-2-7	22.3333	914564
24HR100YR	B-2-7	N-2-7	22.4167	916339
24HR100YR	B-2-7	N-2-7	22.5000	918115
24HR100YR	B-2-7	N-2-7	22.5833	919881
24HR100YR	B-2-7	N-2-7	22.6667	921590
24HR100YR	B-2-7	N-2-7	22.7500	923241
24HR100YR	B-2-7	N-2-7	22.8333	924855
24HR100YR	B-2-7	N-2-7	22.9167	926445
24HR100YR	B-2-7	N-2-7	23.0000	928017
24HR100YR	B-2-7	N-2-7	23.0833	929576
24HR100YR	B-2-7	N-2-7	23.1667	931124
24HR100YR	B-2-7	N-2-7	23.2500	932663
24HR100YR	B-2-7	N-2-7	23.3333	934197
24HR100YR	B-2-7	N-2-7	23.4167	935729
24HR100YR	B-2-7	N-2-7	23.5000	937259
24HR100YR	B-2-7	N-2-7	23.5833	938779
24HR100YR	B-2-7	N-2-7	23.6667	940241
24HR100YR	B-2-7	N-2-7	23.7500	941644
24HR100YR	B-2-7	N-2-7	23.8500	943279
24HR100YR	B-2-7	N-2-7	23.9333	944615
24HR100YR	B-2-7	N-2-7	24.0167	945934
24HR100YR	B-2-7	N-2-7	24.1000	947146

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	24.1833	948025
24HR100YR	B-2-7	N-2-7	24.2667	948619
24HR100YR	B-2-7	N-2-7	24.3500	949030
24HR100YR	B-2-7	N-2-7	24.4333	949317
24HR100YR	B-2-7	N-2-7	24.5167	949519
24HR100YR	B-2-7	N-2-7	24.6000	949654
24HR100YR	B-2-7	N-2-7	24.6833	949737
24HR100YR	B-2-7	N-2-7	24.7667	949782
24HR100YR	B-2-7	N-2-7	24.8500	949804
24HR100YR	B-2-7	N-2-7	24.9333	949811
24HR100YR	B-2-7	N-2-7	25.0167	949812
24HR100YR	B-2-7	N-2-7	25.1000	949812
24HR100YR	B-2-7	N-2-7	25.1833	949812
24HR100YR	B-2-7	N-2-7	25.2667	949812
24HR100YR	B-2-7	N-2-7	25.3500	949812
24HR100YR	B-2-7	N-2-7	25.4333	949812
24HR100YR	B-2-7	N-2-7	25.5167	949812
24HR100YR	B-2-7	N-2-7	25.6000	949812
24HR100YR	B-2-7	N-2-7	25.6833	949812
24HR100YR	B-2-7	N-2-7	25.7667	949812
24HR100YR	B-2-7	N-2-7	25.8500	949812
24HR100YR	B-2-7	N-2-7	25.9333	949812
24HR100YR	B-2-7	N-2-7	26.0167	949812
24HR100YR	B-2-7	N-2-7	26.1000	949812
24HR100YR	B-2-7	N-2-7	26.1833	949812
24HR100YR	B-2-7	N-2-7	26.2667	949812
24HR100YR	B-2-7	N-2-7	26.3500	949812
24HR100YR	B-2-7	N-2-7	26.4333	949812
24HR100YR	B-2-7	N-2-7	26.5167	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	26.6000	949812
24HR100YR	B-2-7	N-2-7	26.6833	949812
24HR100YR	B-2-7	N-2-7	26.7667	949812
24HR100YR	B-2-7	N-2-7	26.8500	949812
24HR100YR	B-2-7	N-2-7	26.9333	949812
24HR100YR	B-2-7	N-2-7	27.0167	949812
24HR100YR	B-2-7	N-2-7	27.1000	949812
24HR100YR	B-2-7	N-2-7	27.1833	949812
24HR100YR	B-2-7	N-2-7	27.2667	949812
24HR100YR	B-2-7	N-2-7	27.3500	949812
24HR100YR	B-2-7	N-2-7	27.4333	949812
24HR100YR	B-2-7	N-2-7	27.5167	949812
24HR100YR	B-2-7	N-2-7	27.6000	949812
24HR100YR	B-2-7	N-2-7	27.6833	949812
24HR100YR	B-2-7	N-2-7	27.7667	949812
24HR100YR	B-2-7	N-2-7	27.8500	949812
24HR100YR	B-2-7	N-2-7	27.9333	949812
24HR100YR	B-2-7	N-2-7	28.0167	949812
24HR100YR	B-2-7	N-2-7	28.1000	949812
24HR100YR	B-2-7	N-2-7	28.1833	949812
24HR100YR	B-2-7	N-2-7	28.2667	949812
24HR100YR	B-2-7	N-2-7	28.3500	949812
24HR100YR	B-2-7	N-2-7	28.4333	949812
24HR100YR	B-2-7	N-2-7	28.5167	949812
24HR100YR	B-2-7	N-2-7	28.6000	949812
24HR100YR	B-2-7	N-2-7	28.6833	949812
24HR100YR	B-2-7	N-2-7	28.7667	949812
24HR100YR	B-2-7	N-2-7	28.8500	949812
24HR100YR	B-2-7	N-2-7	28.9333	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	29.0167	949812
24HR100YR	B-2-7	N-2-7	29.1000	949812
24HR100YR	B-2-7	N-2-7	29.1833	949812
24HR100YR	B-2-7	N-2-7	29.2667	949812
24HR100YR	B-2-7	N-2-7	29.3500	949812
24HR100YR	B-2-7	N-2-7	29.4333	949812
24HR100YR	B-2-7	N-2-7	29.5167	949812
24HR100YR	B-2-7	N-2-7	29.6000	949812
24HR100YR	B-2-7	N-2-7	29.6833	949812
24HR100YR	B-2-7	N-2-7	29.7667	949812
24HR100YR	B-2-7	N-2-7	29.8500	949812
24HR100YR	B-2-7	N-2-7	29.9333	949812
24HR100YR	B-2-7	N-2-7	30.0167	949812
24HR100YR	B-2-7	N-2-7	30.2667	949812
24HR100YR	B-2-7	N-2-7	30.5167	949812
24HR100YR	B-2-7	N-2-7	30.7667	949812
24HR100YR	B-2-7	N-2-7	31.0167	949812
24HR100YR	B-2-7	N-2-7	31.2667	949812
24HR100YR	B-2-7	N-2-7	31.5167	949812
24HR100YR	B-2-7	N-2-7	31.7667	949812
24HR100YR	B-2-7	N-2-7	32.0167	949812
24HR100YR	B-2-7	N-2-7	32.2667	949812
24HR100YR	B-2-7	N-2-7	32.5167	949812
24HR100YR	B-2-7	N-2-7	32.7667	949812
24HR100YR	B-2-7	N-2-7	33.0167	949812
24HR100YR	B-2-7	N-2-7	33.2667	949812
24HR100YR	B-2-7	N-2-7	33.5167	949812
24HR100YR	B-2-7	N-2-7	33.7667	949812
24HR100YR	B-2-7	N-2-7	34.0167	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	34.2667	949812
24HR100YR	B-2-7	N-2-7	34.5167	949812
24HR100YR	B-2-7	N-2-7	34.7667	949812
24HR100YR	B-2-7	N-2-7	35.0167	949812
24HR100YR	B-2-7	N-2-7	35.2667	949812
24HR100YR	B-2-7	N-2-7	35.5167	949812
24HR100YR	B-2-7	N-2-7	35.7667	949812
24HR100YR	B-2-7	N-2-7	36.0167	949812
24HR100YR	B-2-7	N-2-7	36.2667	949812
24HR100YR	B-2-7	N-2-7	36.5167	949812
24HR100YR	B-2-7	N-2-7	36.7667	949812
24HR100YR	B-2-7	N-2-7	37.0167	949812
24HR100YR	B-2-7	N-2-7	37.2667	949812
24HR100YR	B-2-7	N-2-7	37.5167	949812
24HR100YR	B-2-7	N-2-7	37.7667	949812
24HR100YR	B-2-7	N-2-7	38.0167	949812
24HR100YR	B-2-7	N-2-7	38.2667	949812
24HR100YR	B-2-7	N-2-7	38.5167	949812
24HR100YR	B-2-7	N-2-7	38.7667	949812
24HR100YR	B-2-7	N-2-7	39.0167	949812
24HR100YR	B-2-7	N-2-7	39.2667	949812
24HR100YR	B-2-7	N-2-7	39.5167	949812
24HR100YR	B-2-7	N-2-7	39.7667	949812
24HR100YR	B-2-7	N-2-7	40.0167	949812
24HR100YR	B-2-7	N-2-7	40.2667	949812
24HR100YR	B-2-7	N-2-7	40.5167	949812
24HR100YR	B-2-7	N-2-7	40.7667	949812
24HR100YR	B-2-7	N-2-7	41.0167	949812
24HR100YR	B-2-7	N-2-7	41.2667	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	41.5167	949812
24HR100YR	B-2-7	N-2-7	41.7667	949812
24HR100YR	B-2-7	N-2-7	42.0167	949812
24HR100YR	B-2-7	N-2-7	42.2667	949812
24HR100YR	B-2-7	N-2-7	42.5167	949812
24HR100YR	B-2-7	N-2-7	42.7667	949812
24HR100YR	B-2-7	N-2-7	43.0167	949812
24HR100YR	B-2-7	N-2-7	43.2667	949812
24HR100YR	B-2-7	N-2-7	43.5167	949812
24HR100YR	B-2-7	N-2-7	43.7667	949812
24HR100YR	B-2-7	N-2-7	44.0167	949812
24HR100YR	B-2-7	N-2-7	44.2667	949812
24HR100YR	B-2-7	N-2-7	44.5167	949812
24HR100YR	B-2-7	N-2-7	44.7667	949812
24HR100YR	B-2-7	N-2-7	45.0167	949812
24HR100YR	B-2-7	N-2-7	45.2667	949812
24HR100YR	B-2-7	N-2-7	45.5167	949812
24HR100YR	B-2-7	N-2-7	45.7667	949812
24HR100YR	B-2-7	N-2-7	46.0167	949812
24HR100YR	B-2-7	N-2-7	46.2667	949812
24HR100YR	B-2-7	N-2-7	46.5167	949812
24HR100YR	B-2-7	N-2-7	46.7667	949812
24HR100YR	B-2-7	N-2-7	47.0167	949812
24HR100YR	B-2-7	N-2-7	47.2667	949812
24HR100YR	B-2-7	N-2-7	47.5167	949812
24HR100YR	B-2-7	N-2-7	47.7667	949812
24HR100YR	B-2-7	N-2-7	48.0167	949812
24HR100YR	B-2-7	N-2-7	48.2667	949812
24HR100YR	B-2-7	N-2-7	48.5167	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	48.7667	949812
24HR100YR	B-2-7	N-2-7	49.0167	949812
24HR100YR	B-2-7	N-2-7	49.2667	949812
24HR100YR	B-2-7	N-2-7	49.5167	949812
24HR100YR	B-2-7	N-2-7	49.7667	949812
24HR100YR	B-2-7	N-2-7	50.0167	949812
24HR100YR	B-2-7	N-2-7	50.2667	949812
24HR100YR	B-2-7	N-2-7	50.5167	949812
24HR100YR	B-2-7	N-2-7	50.7667	949812
24HR100YR	B-2-7	N-2-7	51.0167	949812
24HR100YR	B-2-7	N-2-7	51.2667	949812
24HR100YR	B-2-7	N-2-7	51.5167	949812
24HR100YR	B-2-7	N-2-7	51.7667	949812
24HR100YR	B-2-7	N-2-7	52.0167	949812
24HR100YR	B-2-7	N-2-7	52.2667	949812
24HR100YR	B-2-7	N-2-7	52.5167	949812
24HR100YR	B-2-7	N-2-7	52.7667	949812
24HR100YR	B-2-7	N-2-7	53.0167	949812
24HR100YR	B-2-7	N-2-7	53.2667	949812
24HR100YR	B-2-7	N-2-7	53.5167	949812
24HR100YR	B-2-7	N-2-7	53.7667	949812
24HR100YR	B-2-7	N-2-7	54.0167	949812
24HR100YR	B-2-7	N-2-7	54.2667	949812
24HR100YR	B-2-7	N-2-7	54.5167	949812
24HR100YR	B-2-7	N-2-7	54.7667	949812
24HR100YR	B-2-7	N-2-7	55.0167	949812
24HR100YR	B-2-7	N-2-7	55.2667	949812
24HR100YR	B-2-7	N-2-7	55.5167	949812
24HR100YR	B-2-7	N-2-7	55.7667	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	56.0167	949812
24HR100YR	B-2-7	N-2-7	56.2667	949812
24HR100YR	B-2-7	N-2-7	56.5167	949812
24HR100YR	B-2-7	N-2-7	56.7667	949812
24HR100YR	B-2-7	N-2-7	57.0167	949812
24HR100YR	B-2-7	N-2-7	57.2667	949812
24HR100YR	B-2-7	N-2-7	57.5167	949812
24HR100YR	B-2-7	N-2-7	57.7667	949812
24HR100YR	B-2-7	N-2-7	58.0167	949812
24HR100YR	B-2-7	N-2-7	58.2667	949812
24HR100YR	B-2-7	N-2-7	58.5167	949812
24HR100YR	B-2-7	N-2-7	58.7667	949812
24HR100YR	B-2-7	N-2-7	59.0167	949812
24HR100YR	B-2-7	N-2-7	59.2667	949812
24HR100YR	B-2-7	N-2-7	59.5167	949812
24HR100YR	B-2-7	N-2-7	59.7667	949812
24HR100YR	B-2-7	N-2-7	60.0167	949812
24HR100YR	B-2-7	N-2-7	60.2667	949812
24HR100YR	B-2-7	N-2-7	60.5167	949812
24HR100YR	B-2-7	N-2-7	60.7667	949812
24HR100YR	B-2-7	N-2-7	61.0167	949812
24HR100YR	B-2-7	N-2-7	61.2667	949812
24HR100YR	B-2-7	N-2-7	61.5167	949812
24HR100YR	B-2-7	N-2-7	61.7667	949812
24HR100YR	B-2-7	N-2-7	62.0167	949812
24HR100YR	B-2-7	N-2-7	62.2667	949812
24HR100YR	B-2-7	N-2-7	62.5167	949812
24HR100YR	B-2-7	N-2-7	62.7667	949812
24HR100YR	B-2-7	N-2-7	63.0167	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	63.2667	949812
24HR100YR	B-2-7	N-2-7	63.5167	949812
24HR100YR	B-2-7	N-2-7	63.7667	949812
24HR100YR	B-2-7	N-2-7	64.0167	949812
24HR100YR	B-2-7	N-2-7	64.2667	949812
24HR100YR	B-2-7	N-2-7	64.5167	949812
24HR100YR	B-2-7	N-2-7	64.7667	949812
24HR100YR	B-2-7	N-2-7	65.0167	949812
24HR100YR	B-2-7	N-2-7	65.2667	949812
24HR100YR	B-2-7	N-2-7	65.5167	949812
24HR100YR	B-2-7	N-2-7	65.7667	949812
24HR100YR	B-2-7	N-2-7	66.0167	949812
24HR100YR	B-2-7	N-2-7	66.2667	949812
24HR100YR	B-2-7	N-2-7	66.5167	949812
24HR100YR	B-2-7	N-2-7	66.7667	949812
24HR100YR	B-2-7	N-2-7	67.0167	949812
24HR100YR	B-2-7	N-2-7	67.2667	949812
24HR100YR	B-2-7	N-2-7	67.5167	949812
24HR100YR	B-2-7	N-2-7	67.7667	949812
24HR100YR	B-2-7	N-2-7	68.0167	949812
24HR100YR	B-2-7	N-2-7	68.2667	949812
24HR100YR	B-2-7	N-2-7	68.5167	949812
24HR100YR	B-2-7	N-2-7	68.7667	949812
24HR100YR	B-2-7	N-2-7	69.0167	949812
24HR100YR	B-2-7	N-2-7	69.2667	949812
24HR100YR	B-2-7	N-2-7	69.5167	949812
24HR100YR	B-2-7	N-2-7	69.7667	949812
24HR100YR	B-2-7	N-2-7	70.0167	949812
24HR100YR	B-2-7	N-2-7	70.2667	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	70.5167	949812
24HR100YR	B-2-7	N-2-7	70.7667	949812
24HR100YR	B-2-7	N-2-7	71.0167	949812
24HR100YR	B-2-7	N-2-7	71.2667	949812
24HR100YR	B-2-7	N-2-7	71.5167	949812
24HR100YR	B-2-7	N-2-7	71.7667	949812
24HR100YR	B-2-7	N-2-7	72.0167	949812
24HR100YR	B-2-7	N-2-7	72.2667	949812
24HR100YR	B-2-7	N-2-7	72.5167	949812
24HR100YR	B-2-7	N-2-7	72.7667	949812
24HR100YR	B-2-7	N-2-7	73.0167	949812
24HR100YR	B-2-7	N-2-7	73.2667	949812
24HR100YR	B-2-7	N-2-7	73.5167	949812
24HR100YR	B-2-7	N-2-7	73.7667	949812
24HR100YR	B-2-7	N-2-7	74.0167	949812
24HR100YR	B-2-7	N-2-7	74.2667	949812
24HR100YR	B-2-7	N-2-7	74.5167	949812
24HR100YR	B-2-7	N-2-7	74.7667	949812
24HR100YR	B-2-7	N-2-7	75.0167	949812
24HR100YR	B-2-7	N-2-7	75.2667	949812
24HR100YR	B-2-7	N-2-7	75.5167	949812
24HR100YR	B-2-7	N-2-7	75.7667	949812
24HR100YR	B-2-7	N-2-7	76.0167	949812
24HR100YR	B-2-7	N-2-7	76.2667	949812
24HR100YR	B-2-7	N-2-7	76.5167	949812
24HR100YR	B-2-7	N-2-7	76.7667	949812
24HR100YR	B-2-7	N-2-7	77.0167	949812
24HR100YR	B-2-7	N-2-7	77.2667	949812
24HR100YR	B-2-7	N-2-7	77.5167	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	77.7667	949812
24HR100YR	B-2-7	N-2-7	78.0167	949812
24HR100YR	B-2-7	N-2-7	78.2667	949812
24HR100YR	B-2-7	N-2-7	78.5167	949812
24HR100YR	B-2-7	N-2-7	78.7667	949812
24HR100YR	B-2-7	N-2-7	79.0167	949812
24HR100YR	B-2-7	N-2-7	79.2667	949812
24HR100YR	B-2-7	N-2-7	79.5167	949812
24HR100YR	B-2-7	N-2-7	79.7667	949812
24HR100YR	B-2-7	N-2-7	80.0167	949812
24HR100YR	B-2-7	N-2-7	80.2667	949812
24HR100YR	B-2-7	N-2-7	80.5167	949812
24HR100YR	B-2-7	N-2-7	80.7667	949812
24HR100YR	B-2-7	N-2-7	81.0167	949812
24HR100YR	B-2-7	N-2-7	81.2667	949812
24HR100YR	B-2-7	N-2-7	81.5167	949812
24HR100YR	B-2-7	N-2-7	81.7667	949812
24HR100YR	B-2-7	N-2-7	82.0167	949812
24HR100YR	B-2-7	N-2-7	82.2667	949812
24HR100YR	B-2-7	N-2-7	82.5167	949812
24HR100YR	B-2-7	N-2-7	82.7667	949812
24HR100YR	B-2-7	N-2-7	83.0167	949812
24HR100YR	B-2-7	N-2-7	83.2667	949812
24HR100YR	B-2-7	N-2-7	83.5167	949812
24HR100YR	B-2-7	N-2-7	83.7667	949812
24HR100YR	B-2-7	N-2-7	84.0167	949812
24HR100YR	B-2-7	N-2-7	84.2667	949812
24HR100YR	B-2-7	N-2-7	84.5167	949812
24HR100YR	B-2-7	N-2-7	84.7667	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	85.0167	949812
24HR100YR	B-2-7	N-2-7	85.2667	949812
24HR100YR	B-2-7	N-2-7	85.5167	949812
24HR100YR	B-2-7	N-2-7	85.7667	949812
24HR100YR	B-2-7	N-2-7	86.0167	949812
24HR100YR	B-2-7	N-2-7	86.2667	949812
24HR100YR	B-2-7	N-2-7	86.5167	949812
24HR100YR	B-2-7	N-2-7	86.7667	949812
24HR100YR	B-2-7	N-2-7	87.0167	949812
24HR100YR	B-2-7	N-2-7	87.2667	949812
24HR100YR	B-2-7	N-2-7	87.5167	949812
24HR100YR	B-2-7	N-2-7	87.7667	949812
24HR100YR	B-2-7	N-2-7	88.0167	949812
24HR100YR	B-2-7	N-2-7	88.2667	949812
24HR100YR	B-2-7	N-2-7	88.5167	949812
24HR100YR	B-2-7	N-2-7	88.7667	949812
24HR100YR	B-2-7	N-2-7	89.0167	949812
24HR100YR	B-2-7	N-2-7	89.2667	949812
24HR100YR	B-2-7	N-2-7	89.5167	949812
24HR100YR	B-2-7	N-2-7	89.7667	949812
24HR100YR	B-2-7	N-2-7	90.0167	949812
24HR100YR	B-2-7	N-2-7	90.2667	949812
24HR100YR	B-2-7	N-2-7	90.5167	949812
24HR100YR	B-2-7	N-2-7	90.7667	949812
24HR100YR	B-2-7	N-2-7	91.0167	949812
24HR100YR	B-2-7	N-2-7	91.2667	949812
24HR100YR	B-2-7	N-2-7	91.5167	949812
24HR100YR	B-2-7	N-2-7	91.7667	949812
24HR100YR	B-2-7	N-2-7	92.0167	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	92.2667	949812
24HR100YR	B-2-7	N-2-7	92.5167	949812
24HR100YR	B-2-7	N-2-7	92.7667	949812
24HR100YR	B-2-7	N-2-7	93.0167	949812
24HR100YR	B-2-7	N-2-7	93.2667	949812
24HR100YR	B-2-7	N-2-7	93.5167	949812
24HR100YR	B-2-7	N-2-7	93.7667	949812
24HR100YR	B-2-7	N-2-7	94.0167	949812
24HR100YR	B-2-7	N-2-7	94.2667	949812
24HR100YR	B-2-7	N-2-7	94.5167	949812
24HR100YR	B-2-7	N-2-7	94.7667	949812
24HR100YR	B-2-7	N-2-7	95.0167	949812
24HR100YR	B-2-7	N-2-7	95.2667	949812
24HR100YR	B-2-7	N-2-7	95.5167	949812
24HR100YR	B-2-7	N-2-7	95.7667	949812
24HR100YR	B-2-7	N-2-7	96.0167	949812
24HR100YR	B-2-7	N-2-7	96.2667	949812
24HR100YR	B-2-7	N-2-7	96.5167	949812
24HR100YR	B-2-7	N-2-7	96.7667	949812
24HR100YR	B-2-7	N-2-7	97.0167	949812
24HR100YR	B-2-7	N-2-7	97.2667	949812
24HR100YR	B-2-7	N-2-7	97.5167	949812
24HR100YR	B-2-7	N-2-7	97.7667	949812
24HR100YR	B-2-7	N-2-7	98.0167	949812
24HR100YR	B-2-7	N-2-7	98.2667	949812
24HR100YR	B-2-7	N-2-7	98.5167	949812
24HR100YR	B-2-7	N-2-7	98.7667	949812
24HR100YR	B-2-7	N-2-7	99.0167	949812
24HR100YR	B-2-7	N-2-7	99.2667	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	99.5167	949812
24HR100YR	B-2-7	N-2-7	99.7667	949812
24HR100YR	B-2-7	N-2-7	100.0167	949812
24HR100YR	B-2-7	N-2-7	100.2667	949812
24HR100YR	B-2-7	N-2-7	100.5167	949812
24HR100YR	B-2-7	N-2-7	100.7667	949812
24HR100YR	B-2-7	N-2-7	101.0167	949812
24HR100YR	B-2-7	N-2-7	101.2667	949812
24HR100YR	B-2-7	N-2-7	101.5167	949812
24HR100YR	B-2-7	N-2-7	101.7667	949812
24HR100YR	B-2-7	N-2-7	102.0167	949812
24HR100YR	B-2-7	N-2-7	102.2667	949812
24HR100YR	B-2-7	N-2-7	102.5167	949812
24HR100YR	B-2-7	N-2-7	102.7667	949812
24HR100YR	B-2-7	N-2-7	103.0167	949812
24HR100YR	B-2-7	N-2-7	103.2667	949812
24HR100YR	B-2-7	N-2-7	103.5167	949812
24HR100YR	B-2-7	N-2-7	103.7667	949812
24HR100YR	B-2-7	N-2-7	104.0167	949812
24HR100YR	B-2-7	N-2-7	104.2667	949812
24HR100YR	B-2-7	N-2-7	104.5167	949812
24HR100YR	B-2-7	N-2-7	104.7667	949812
24HR100YR	B-2-7	N-2-7	105.0167	949812
24HR100YR	B-2-7	N-2-7	105.2667	949812
24HR100YR	B-2-7	N-2-7	105.5167	949812
24HR100YR	B-2-7	N-2-7	105.7667	949812
24HR100YR	B-2-7	N-2-7	106.0167	949812
24HR100YR	B-2-7	N-2-7	106.2667	949812
24HR100YR	B-2-7	N-2-7	106.5167	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	106.7667	949812
24HR100YR	B-2-7	N-2-7	107.0167	949812
24HR100YR	B-2-7	N-2-7	107.2667	949812
24HR100YR	B-2-7	N-2-7	107.5167	949812
24HR100YR	B-2-7	N-2-7	107.7667	949812
24HR100YR	B-2-7	N-2-7	108.0167	949812
24HR100YR	B-2-7	N-2-7	108.2667	949812
24HR100YR	B-2-7	N-2-7	108.5167	949812
24HR100YR	B-2-7	N-2-7	108.7667	949812
24HR100YR	B-2-7	N-2-7	109.0167	949812
24HR100YR	B-2-7	N-2-7	109.2667	949812
24HR100YR	B-2-7	N-2-7	109.5167	949812
24HR100YR	B-2-7	N-2-7	109.7667	949812
24HR100YR	B-2-7	N-2-7	110.0167	949812
24HR100YR	B-2-7	N-2-7	110.2667	949812
24HR100YR	B-2-7	N-2-7	110.5167	949812
24HR100YR	B-2-7	N-2-7	110.7667	949812
24HR100YR	B-2-7	N-2-7	111.0167	949812
24HR100YR	B-2-7	N-2-7	111.2667	949812
24HR100YR	B-2-7	N-2-7	111.5167	949812
24HR100YR	B-2-7	N-2-7	111.7667	949812
24HR100YR	B-2-7	N-2-7	112.0167	949812
24HR100YR	B-2-7	N-2-7	112.2667	949812
24HR100YR	B-2-7	N-2-7	112.5167	949812
24HR100YR	B-2-7	N-2-7	112.7667	949812
24HR100YR	B-2-7	N-2-7	113.0167	949812
24HR100YR	B-2-7	N-2-7	113.2667	949812
24HR100YR	B-2-7	N-2-7	113.5167	949812
24HR100YR	B-2-7	N-2-7	113.7667	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	114.0167	949812
24HR100YR	B-2-7	N-2-7	114.2667	949812
24HR100YR	B-2-7	N-2-7	114.5167	949812
24HR100YR	B-2-7	N-2-7	114.7667	949812
24HR100YR	B-2-7	N-2-7	115.0167	949812
24HR100YR	B-2-7	N-2-7	115.2667	949812
24HR100YR	B-2-7	N-2-7	115.5167	949812
24HR100YR	B-2-7	N-2-7	115.7667	949812
24HR100YR	B-2-7	N-2-7	116.0167	949812
24HR100YR	B-2-7	N-2-7	116.2667	949812
24HR100YR	B-2-7	N-2-7	116.5167	949812
24HR100YR	B-2-7	N-2-7	116.7667	949812
24HR100YR	B-2-7	N-2-7	117.0167	949812
24HR100YR	B-2-7	N-2-7	117.2667	949812
24HR100YR	B-2-7	N-2-7	117.5167	949812
24HR100YR	B-2-7	N-2-7	117.7667	949812
24HR100YR	B-2-7	N-2-7	118.0167	949812
24HR100YR	B-2-7	N-2-7	118.2667	949812
24HR100YR	B-2-7	N-2-7	118.5167	949812
24HR100YR	B-2-7	N-2-7	118.7667	949812
24HR100YR	B-2-7	N-2-7	119.0167	949812
24HR100YR	B-2-7	N-2-7	119.2667	949812
24HR100YR	B-2-7	N-2-7	119.5167	949812
24HR100YR	B-2-7	N-2-7	119.7667	949812
24HR100YR	B-2-7	N-2-7	120.0167	949812
24HR100YR	B-2-7	N-2-7	120.2667	949812
24HR100YR	B-2-7	N-2-7	120.5167	949812
24HR100YR	B-2-7	N-2-7	120.7667	949812
24HR100YR	B-2-7	N-2-7	121.0167	949812

Sim	Basin Name	Node Name	Relative Time [hrs]	Runoff Volume [ft3]
24HR100YR	B-2-7	N-2-7	121.2667	949812
24HR100YR	B-2-7	N-2-7	121.5167	949812
24HR100YR	B-2-7	N-2-7	121.7667	949812
24HR100YR	B-2-7	N-2-7	122.0167	949812
24HR100YR	B-2-7	N-2-7	122.2667	949812
24HR100YR	B-2-7	N-2-7	122.5167	949812
24HR100YR	B-2-7	N-2-7	122.7667	949812
24HR100YR	B-2-7	N-2-7	123.0167	949812
24HR100YR	B-2-7	N-2-7	123.2667	949812
24HR100YR	B-2-7	N-2-7	123.5167	949812
24HR100YR	B-2-7	N-2-7	123.7667	949812
24HR100YR	B-2-7	N-2-7	124.0167	949812
24HR100YR	B-2-7	N-2-7	124.2667	949812
24HR100YR	B-2-7	N-2-7	124.5167	949812
24HR100YR	B-2-7	N-2-7	124.7667	949812
24HR100YR	B-2-7	N-2-7	125.0167	949812

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APPENDIX D

Geotechnical Information

DRAFT

September 23, 2020

WBQ Design & Engineering, Inc.
201 N. Magnolia Avenue, Suite 200
Orlando, FL 32801

Attn: Mr. Troy Vargas P.E.

RE: PSR Geotechnical Report
Suncoast Parkway 2 (SR 589)
From SR 44 (W Gulf to Lake Hwy) to CR 486 (W Norvell Bryant Hwy)
Citrus County, Florida
FPN 442764-1-32-01
Tierra Project No.: 6511-18-108

Mr. Vargas:

Tierra, Inc. (Tierra) has completed preliminary geotechnical engineering services for the pond alternative sites for the above referenced project to support the Pond Siting Report (PSR). The results of our subsurface exploration are presented herein.

The objective of our study was to obtain information concerning subsurface conditions within the pond alternatives to provide preliminary geotechnical design parameters including *insitu* subsurface soil conditions and estimated Seasonal High Groundwater Table (SHGWT) depths to the project drainage engineer for the project PSR. It should be noted that as pond design progresses and pond sites have been selected, Tierra will perform additional pond geotechnical test borings and permeability testing to assist with final design.

Project Description and Background

The project consists of the design of approximately 2.7 miles of new alignment of the Suncoast Parkway 2 (SR 589) from SR 44 (W Gulf to Lake Hwy) to CR 486 (W Norvell Bryant Highway) in Citrus County, Florida. Approximately the first eighty percent of the project alignment (Station 4270+00 to 4382+00) traverses open and wooded natural areas and agricultural lands. The remainder of the project alignment from Knoll Road to CR 486 mostly traverses an area that was previously excavated for a sand mine. The existing elevation along this portion of the alignment is on the order of 40 feet lower than natural grades. An existing landfill site also exists to the south of the new alignment near Station 4385+00. The Knoll Road re-alignment will circumvent the landfill area.

Based on information provided by WBQ, we understand there are three (3) post-development drainage basins: Basins 2-5, 2-6 and 2-7. Basin 2-5 contains 4 alternative pond locations and Basins 2-6 and 2-7 each contain 3 alternative pond locations. Another pond is proposed along the Knoll Road re-alignment, DRA-1A. This pond along Knoll Road will replace an existing pond. Also, the existing District 7 Pond E along SR 44 will be replaced and moved further to the east and is denoted as DRA-E. This new pond will be larger than the previous pond.

Engineering services for the project (the extension of the Suncoast from US 98 to North of CR 486) started in 2007 and geotechnical services were performed to support the project. The project was taken to the 60% submittal and was then placed on hold in 2009. Tierra performed borings along the roadway alignment and within the proposed pond areas between 2007 and 2009. In 2013, the project was re-started up to SR 44. In 2018, the extension of the Suncoast from SR 44 to CR 486

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was initiated. However, the roadway corridor has shifted slightly from the previous design. Some previous pond sites are no longer being considered while others fall within or near proposed current pond alternative sites. Tierra utilized the previously performed applicable borings from 2008 and 2009 in our analyses and evaluation in conjunction with borings performed when the project was re-started. Thus, some borings will indicate “dates performed” in the 2008 to 2009 range and some in 2019.

Review of Published Information

Tierra has reviewed the Soil Survey of Citrus County, Florida published by the USDA and the “Crystal River, Florida” and “Homosassa, Florida” Quadrangle Maps produced by the USGS. A summary of the soil mapping units in the vicinity of the pond alternatives is presented on the **Summary of USDA Soil Survey Information** in the **Attachments** of this report. Reproductions of the **USDA Soil Survey Map** and **USGS Quadrangle Maps** are also provided in the **Attachments**.

Pond Alternative Site Pond 2-7, Alt 3 is located near/within a previous excavated sand borrow pit. The ground surface within the excavated areas is approximately 40 feet below natural grades.

Field Exploration Program

Tierra performed Standard Penetration Test (SPT) borings to depths ranging from approximately 15 to 50 feet below existing grades to evaluate deeper soil conditions near or within the footprint of the proposed pond sites. As previously mentioned, borings performed during the initial phases of the Suncoast Parkway 2 project from 2007 to 2009 are also being utilized as applicable. The SPT borings were performed with the use of a drill rig using Bentonite Mud drilling procedures. The soil sampling was performed in general accordance with ASTM test designation D-1586. Generally, SPT resistance N-values were taken at intervals of 2 feet in the initial 10 feet and at intervals of 5 feet thereafter. Within some of the SPT borings performed, the initial 2 to 4 feet were manually augered to verify utility clearances. Representative portions of these soil samples were sealed in glass jars, labeled and transferred to our laboratory for classification and analysis.

The area within Pond DRA-E was heavily vegetated and thus proved difficult to access with our drill rigs without clearing. For this PSR stage, Tierra performed hand auger borings advanced to depths ranging from approximately 11 to 13 feet below the existing ground surface. The auger borings terminated approximately 5 feet below the proposed pond bottom. The hand auger borings were performed in general accordance with the procedures of ASTM D-1452 by manually twisting and advancing a bucket auger into the ground, typically in 6-inch increments. As each soil type was revealed, representative samples were placed in air-tight containers and returned to our office for confirmation of the field classification by a geotechnical engineer.

To further identify the groundwater conditions present along the proposed alignment, temporary piezometers were installed. Temporary piezometers were installed through rotary wash drilling using bio-degradable drilling mud. During the rotary wash drilling, soil strata breaks were observed in the drill cuttings and recorded. Each temporary piezometer was constructed of 2-inch diameter, Schedule 40 PVC casing (riser) and 20 feet of 2-inch diameter, 0.01 inch slot size, Schedule 40 PVC mill-slotted screen. Both the riser and screen were equipped with threaded flush joints. Above the slotted screen, two feet of 20/30 silica sand was placed followed by approximately one foot of fine sand. Bentonite seal was then placed within the annular space above the sand to approximately

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the ground surface to provide a seal. The riser extended from the top of the screen to approximately 2 to 3 feet above the ground surface. The piezometers were installed to depths ranging from approximately 90 to 115 feet below the existing ground surface. The water level within each piezometer was measured on selected dates using an electric water level meter. A **Summary of Groundwater Table Measurements from Piezometers** is presented in the **Attachments**.

The locations and elevations of the borings and temporary piezometers were located by the project surveyor and are denoted as such on the attached **Pond Soil Profile Sheets and Temporary Piezometer Profiles Sheets**.

Results of Field Exploration Program

In general, the SPT borings encountered sandy soils underlain by plastic silty/clayey soils sometimes underlain by weathered limestone to the boring termination depths. Specific information on the soil conditions encountered within the borings performed to date can be found on the attached **Pond Soil Profiles** sheets.

The groundwater table was not apparent within the SPT borings prior to the introduction of drilling fluids (a depth of 10 feet) performed during our 2019 field exploration. As a result, GNA (Groundwater Not Apparent) is shown adjacent to the soil profiles. Some borings in the summer of 2008 within the pond alternatives near SR 44 did encountered a “perched” groundwater table. A perched condition is described in the following section of the report. The groundwater was not encountered (GNE) within the depth of the auger borings performed within pond DRA-E. Based on the groundwater measurements from the installed piezometers during the geotechnical exploration program, the stabilized groundwater table level in the project area ranges from +2.7 to +8.0 feet, NAVD88. A summary table with the individual piezometer readings is presented in the **Attachments**. However, a temporary “perched” groundwater condition could exist above Strata 3, 4, and 5 soils.

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences (i.e. existing water management canals, swales, drainage ponds, underdrains and areas of covered soils, such as paved parking lots and sidewalks).

Perched Groundwater and Recommendations

Based on the results of the borings performed to date for the preliminary pond site alternatives and the groundwater levels measured within the piezometers, it is our opinion that the apparent groundwater table will be encountered at elevations ranging from approximately +5 to +10 feet, NAVD88. Based on a review of the “Potentiometric surface elevation of the upper Floridan Aquifer, West-Central Florida maps” published by the USGS, these values are relatively consistent with the potentiometric surface elevation of the upper Floridan Aquifer along the project alignment.

The low hydraulic conductivity of the more plastic Strata 3, 4, and 5 soils could result in a temporary “perched” groundwater table during the rainy season. A “perched” groundwater condition can occur at locations where a less permeable layer exists (such as clayey sands or clays) below a more permeable soil (sand) layer. A perched groundwater condition can occur following rain events or during the rainy season at the interface above the less permeable layer. The “perched” water table

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is trapped at a higher elevation than the surrounding true apparent water table. The true or apparent water table was the level measured in the piezometers. During our field activities, groundwater table levels and the soils encountered indicated "perched" conditions at some locations. The SHGWT estimates due to a "perched" condition are shown adjacent to borings on the **Pond Soil Profiles** sheets. It is important to note that the "perched" groundwater is dependent upon the less permeable soils being present. Therefore, if the less permeable layer is excavated, the "perched" groundwater table will also be lowered accordingly.

The hydraulic conductivity within the Strata 3, 4, and 5 (clayey soils) is anticipated to be low and at least an order to orders of magnitude less than Strata 1 and 2. Strata 3, 4, and 5 should be treated as confining layers. As such, the "Base of Aquifer" value is recommended to be set at the top of the clayey soils (Strata 3, 4, and 5) to reflect the clayey soils "semi-confining to confining" properties compared to the sandy soils (Strata 1 and 2). Stratum 2 soils will be less permeable than Stratum 1 soils. Densely compacted sands will exhibit lower permeability values when compared to less dense sandy soils.

Based on a review of the USDA Soil Survey and past experience in the project area, the near-surface sandy soils along the project will have a high permeability and high infiltration potential. As the project progresses field infiltration and permeability testing will be perform to support this assertion and finalize the design.

Based on past testing along the Suncoast Corridor, Stratum 1 soils would have moderately permeability values of 10 to 20 feet/day (up to 50 feet/day in the upper loose sandy soils), Stratum 2 soils (A-2-4) would range from 0.5 to 6 feet/day depending on fines content, and Strata 3, 4 and 5 would have very low permeability values. Site specific field testing will be performed for the pond design as the project progresses.

The encountered or estimated insitu "perched" groundwater table elevations are presented adjacent to selected pond boring soil profiles on the **Pond Soil Profiles** sheets**.**

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A value for fillable porosity within Strata 1 and 2 may be assumed at 25% for modeling purposes to account for potential variability within the soil profile. This value is at the lower range for the *insitu* relative density of Strata 1 and 2.

Stratum 1 would be considered SELECT (S) per Index 120-001. Stratum 2 is also SELECT (S) per Index 120-002 but may be moisture sensitive. Strata 3 and 4 are PLASTIC (P) soils and Stratum 5 is a Highly Plastic (H) stratum.

Should there be any questions regarding this letter, please do not hesitate to contact our office at (813) 989-1354. We look forward to working with you and your organization on this and future projects.

Respectfully Submitted,

TIERRA, INC.

Dylan A. Nelson, E.I.
Geotechnical Engineer Intern

Marc E. Novak, Ph.D., P.E.
Senior Geotechnical Engineer
Florida License No. 67431

Kevin H. Scott, P.E.
Senior Geotechnical Engineer
Florida License No. 65514

Attachments:

USDA Soil Survey Map
USGS Quadrangle Map
Summary of USDA Soil Survey Information
Pond Soil Profile Sheets
Temporary Piezometer Location Plan Sheet
Temporary Piezometer Profile Sheets
Summary of Groundwater Table Measurements from Piezometers

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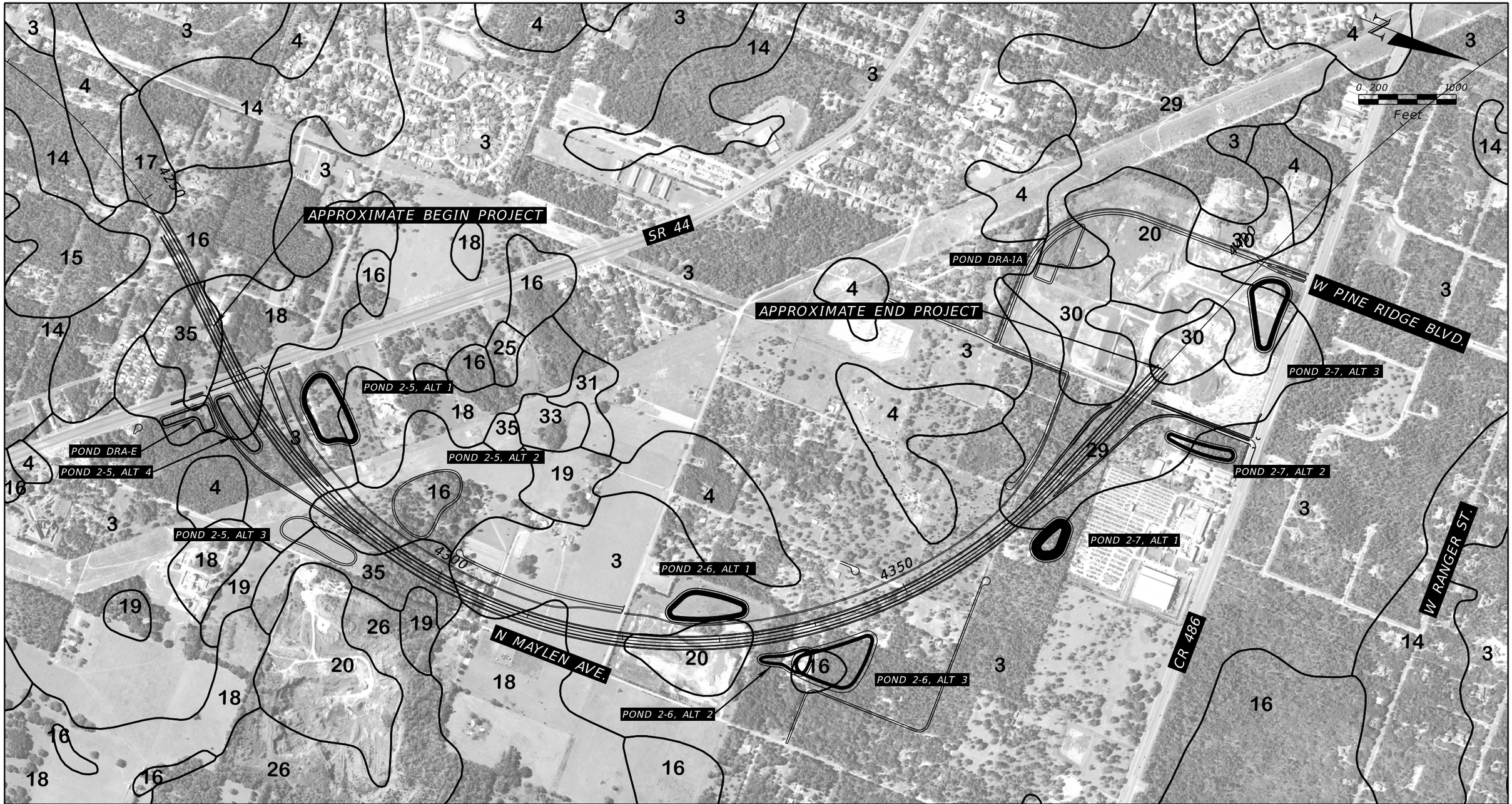


REFERENCE: USDA SOIL SURVEY OF CITRUS COUNTY, FLORIDA

TOWNSHIP:	18S	18S
RANGE:	18E	17E
SECTION:	29, 30, 32	12

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

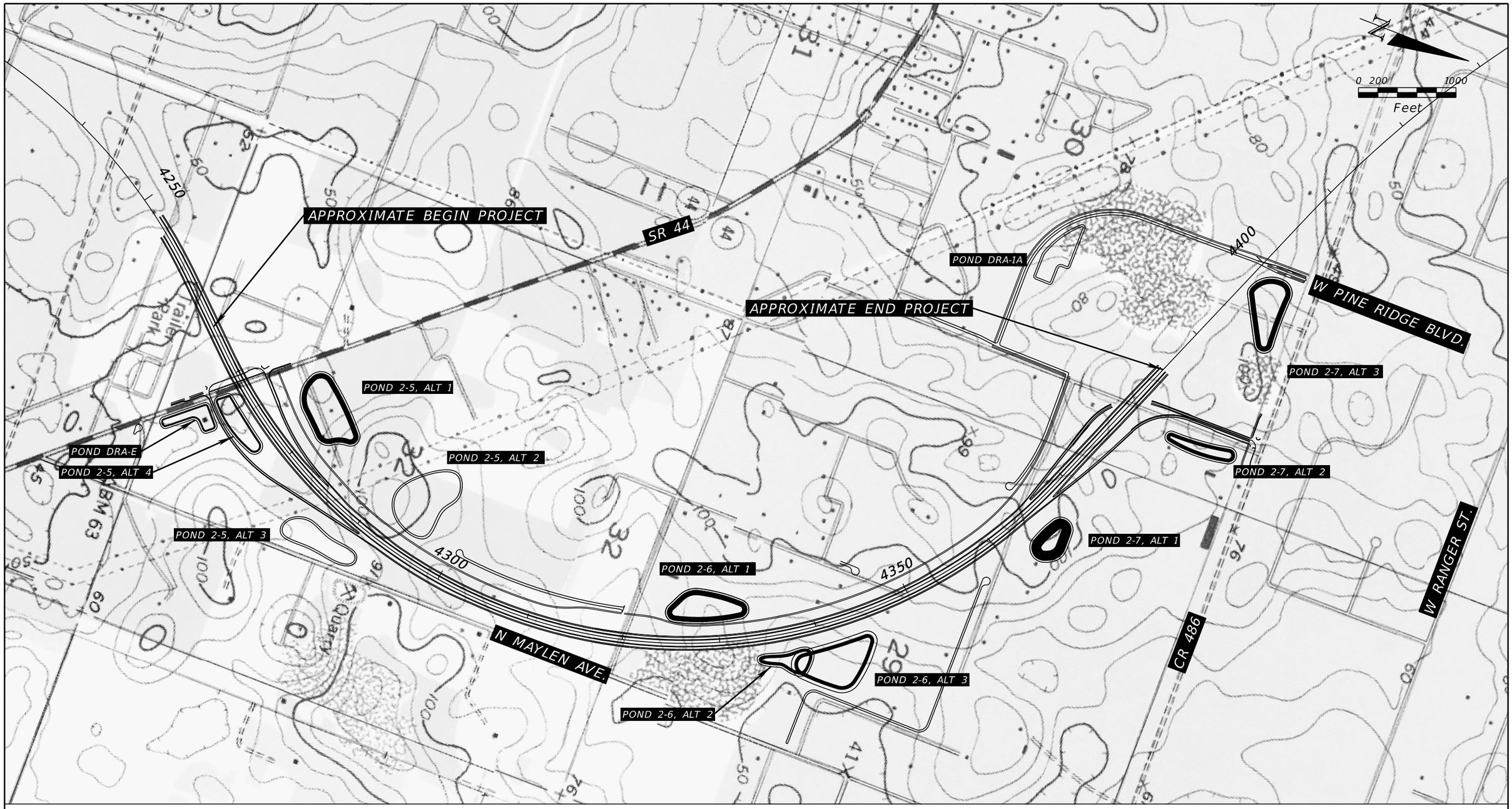
MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-32-01

USDA SOIL SURVEY MAP

SHEET NO.



REFERENCE: USGS QUADRANGLE MAP OF "CRYSTAL RIVER, FLORIDA" AND "HOMOSASSA, FLORIDA"

TOWNSHIP:	18S	18S
RANGE:	18E	17E
SECTION:	29, 30, 32	12

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-32-01

USGS QUADRANGLE MAP

SHEET NO.

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Summary of USDA Soil Survey Information
Suncoast Parkway 2 (SR 589) from SR 44 (W Gulf to Lake Hwy) to CR 486 (W Norvell Bryant Hwy)
Citrus County, Florida
FPN: 442764-1-32-01
Tierra Project No.: 6511-18-108

USDA Map Symbol and Soil Name	Soil Classification				pH	Seasonal High Water Table	
	Depth (in)	USCS	AASHTO	Saturated Hydraulic Conductivity (in/hr)		Depth (feet)	Months
(3) Candler fine sand, 0 to 5 percent slopes	0-5	SM, SP, SP-SM	A-2-4, A-3	6.0 - 50.0	4.5-6.0	>6.0	Jan-Dec
	5-74	SM, SP, SP-SM	A-2-4, A-3	6.0 - 50.0	4.5-6.0		
	74-80	SP-SM,SM, SP, SC-SM	A-2-4, A-3	6.0 - 20.0	4.5-6.0		
(4) Candler	0-6	SP-SM, SM	A-2-4, A-3	6.0 - 50.0	4.5-6.0	>6.0	Jan-Dec
	6-72	SP-SM, SM	A-2-4, A-3	6.0 - 50.0	4.5-6.0		
	72-80	SM, SP-SM, SC-SM	A-3, A-2-4	6.0 - 50.0	4.5-6.0		
(16) Arredondo fine sand, 0 to 5 percent slopes	0-8	SM, SP-SM	A-3, A-2-4	6.0 - 20.0	4.5-6.0	>6.0	Jan-Dec
	8-62	SM, SP-SM	A-3, A-2-4	6.0 - 20.0	4.5-6.0		
	62-69	SC-SM, SM	A-2-4, A-2-6	2.0 - 6.0	4.5-6.0		
	69-80	SC	A-6, A-7-6, A-2-4	0.6 - 6.0	4.5-6.0		
(18) Kendrick fine sand 5 to 8 percent slopes	0-7	SM, SP-SM	A-2-4, A-3	6.0 - 20.0	4.5-6.0	>6.0	Jan-Dec
	7-28	SM, SP-SM	A-2-4, A-3	6.0 - 20.0	4.5-6.0		
	28-73	SC	A-2-4, A-6, A-2-6	0.6 - 6.0	4.5-6.0		
	73-80	SC	A-6, A-2-6, A-2-4	0.6 - 6.0	4.5-6.0		
(20) Pits	INFORMATION NOT AVAILABLE						
(29) Astatula fine sand, 0 to 5 percent slopes	0-5	SP-SM	A-3, A-2-4	20.0 - 50.0	4.5-6.5	>6.0	Jan-Dec
	5-80	SP-SM	A-3, A-2-4	20.0 - 50.0	4.5-6.5		
(30) Astatula fine sand, 5 to 8 percent slopes	0-2	SP, SP-SM	A-3	20.0 - 50.0	4.5-6.5	>6.0	Jan-Dec
	2-80	SP, SP-SM	A-3	20.0 - 50.0	4.5-6.5		
(35) Sparr fine sand, 0 to 5 percent slopes	0-8	SM, SP-SM	A-3, A-2-4	6.0 - 20.0	4.5-6.5	1.5-3.5	July-Oct
	8-50	SM, SP-SM	A-2-4, A-3	6.0 - 20.0	4.5-6.5		
	50-59	SC, SC-SM, SM	A-2-4	0.6 - 2.0	4.5-6.5		
	59-80	SC, SC-SM	A-2, A-4, A-6	0.1 - 0.6	4.5-6.5		

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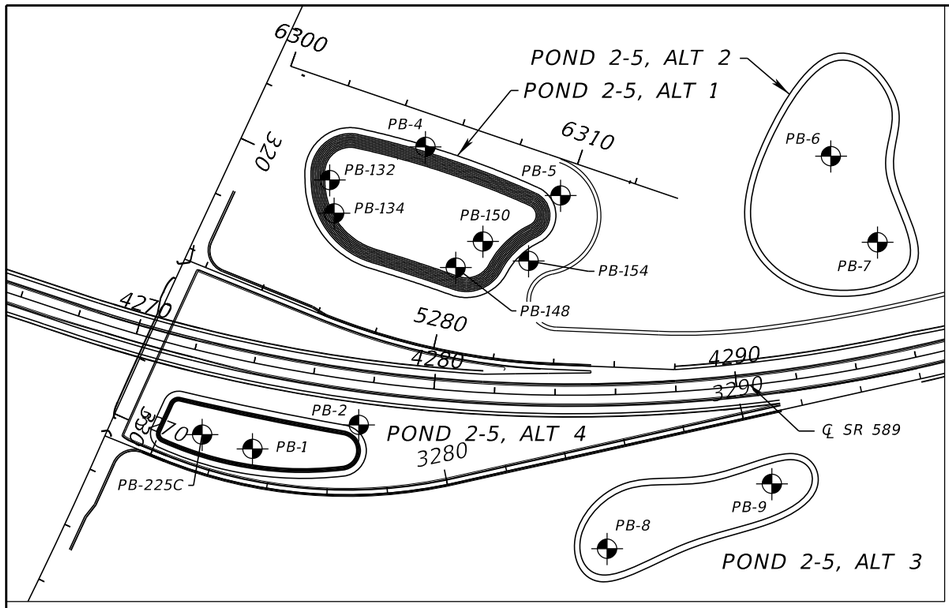
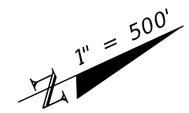




BORING LOCATION PLAN

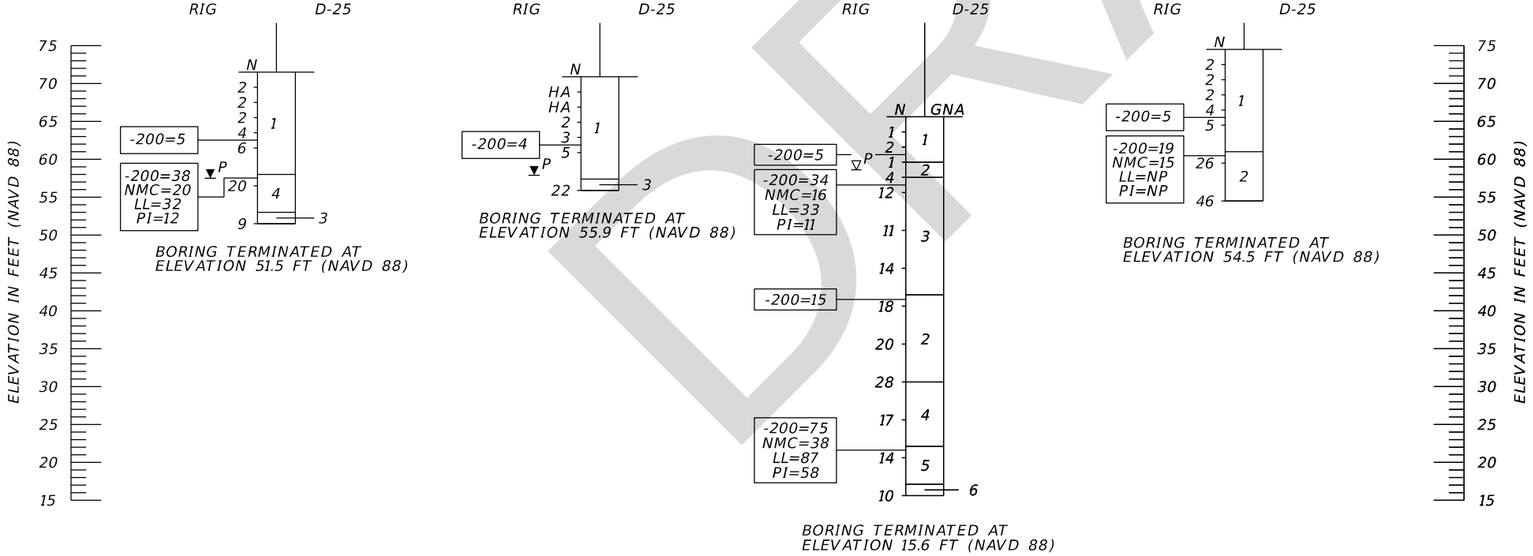
LEGEND

1.	GRAY TO ORANGE-BROWN TO BROWN SAND TO SAND WITH SILT (A-3/A-2-4)
2.	GRAY TO ORANGE-BROWN TO BROWN SILTY SAND (A-2-4)
3.	GRAY TO ORANGE-BROWN CLAYEY SAND (A-2-6)
4.	GRAY TO ORANGE-BROWN TO RED-BROWN SANDY TO SILTY CLAY (A-4/A-6/A-7-6)
5.	BLUE-GRAY TO ORANGE-BROWN SANDY CLAY TO CLAY (A-7-5/A-7-6)
6.	LIMESTONE OCCASIONALLY LAYERED WITH CALCAREOUS CLAY
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
▼P	PERCHED GROUNDWATER TABLE ENCOUNTERED
▽P	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE IS A PERCHED CONDITION
GNE	GROUNDWATER NOT ENCOUNTERED
GNA	GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
℄ CONST. SR 589	CENTERLINE CONSTRUCTION OF SR 589

NOTE: 1. BORING LOCATIONS WERE PROVIDED BY THE PROJECT SURVEYOR.

2. BORING LOCATIONS AND ELEVATIONS DENOTED WITH AN ASTERISK (*) WERE DETERMINED IN THE FIELD BY TIERRA USING HANDHELD GPS DEVICES AND USING PROJECT DESIGN FILES AND THEREFORE SHOULD BE CONSIDERED APPROXIMATE.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	LESS THAN 4 4 to 10 10 to 30 30 to 50 GREATER THAN 50	LESS THAN 3 3 to 8 8 to 24 24 to 40 GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT SOFT FIRM STIFF VERY STIFF HARD	LESS THAN 2 2 to 4 4 to 8 8 to 15 15 to 30 GREATER THAN 30	LESS THAN 1 1 to 3 3 to 6 6 to 12 12 to 24 GREATER THAN 24



POND 2-5, ALT 1

DRAFT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-52-01

POND BORINGS

SHEET NO.

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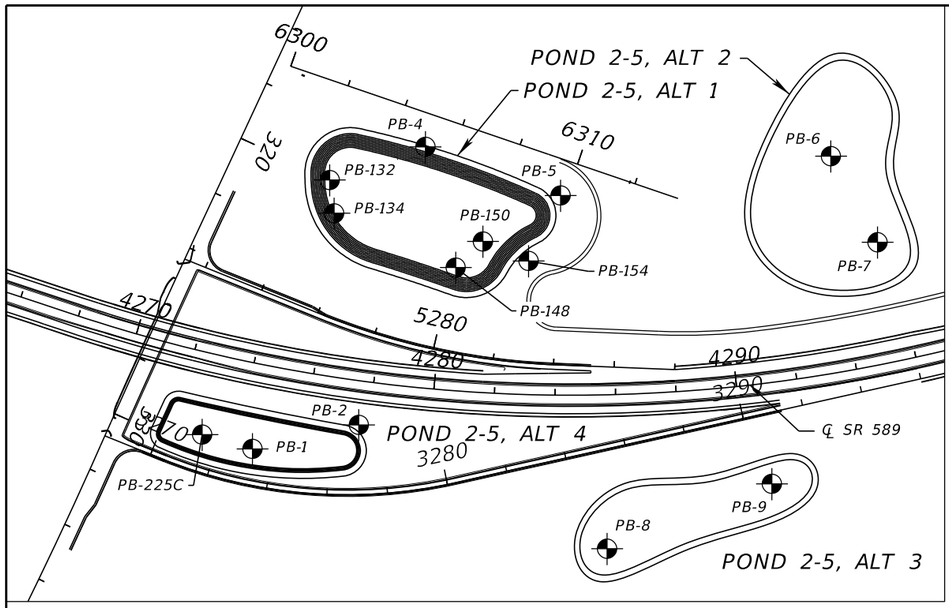
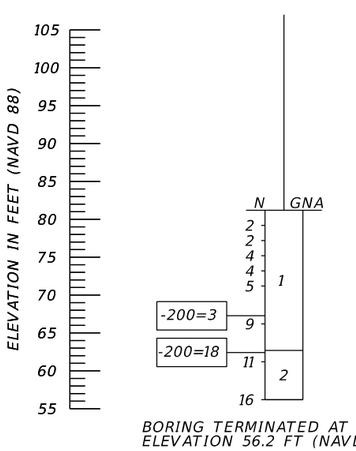


1" = 500'

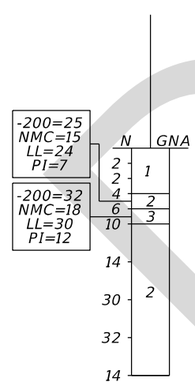
BORING LOCATION PLAN

BOR # PB-150
STA. 4281+31
REF. ℄ CONST. SR 589
OFF 498' LT.
ELEV. 81.2
DATE 8/30/2008
DRILLER A. TORRES
HAMMER SAFETY
RIG D-25



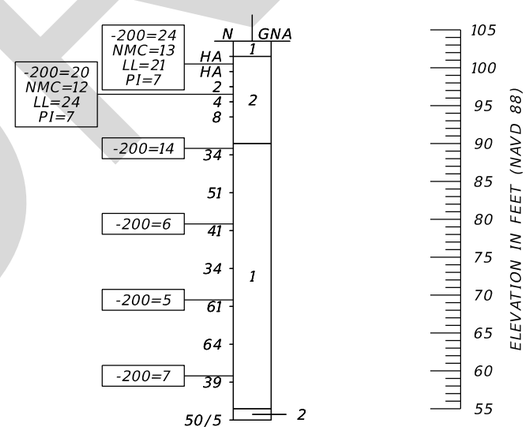
BORING TERMINATED AT ELEVATION 56.2 FT (NAVD 88)

BOR # PB-154
STA. 4282+99
REF. ℄ CONST. SR 589
OFF 441' LT.
ELEV. 89.4
DATE 8/31/2008
DRILLER A. TORRES
HAMMER SAFETY
RIG D-25



BORING TERMINATED AT ELEVATION 59.5 FT (NAVD 88)

BOR # PB-5
STA. 4284+13
REF. ℄ CONST. SR 589
OFF. 659' LT.
ELEV. 103.5
DATE 12/4/2019
DRILLER K. CAUDILL
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT ELEVATION 53.5 FT (NAVD 88)

LEGEND

1. GRAY TO ORANGE-BROWN TO BROWN SAND TO SAND WITH SILT (A-3/A-2-4)
2. GRAY TO ORANGE-BROWN TO BROWN SILTY SAND (A-2-4)
3. GRAY TO ORANGE-BROWN CLAYEY SAND (A-2-6)
4. GRAY TO ORANGE-BROWN TO RED-BROWN SANDY TO SILTY CLAY (A-4/A-6/A-7-6)
5. BLUE-GRAY TO ORANGE-BROWN SANDY CLAY TO CLAY (A-7-5/A-7-6)
6. LIMESTONE OCCASIONALLY LAYERED WITH CALCAREOUS CLAY

A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
▼P	PERCHED GROUNDWATER TABLE ENCOUNTERED
▽P	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE IS A PERCHED CONDITION
GNE	GROUNDWATER NOT ENCOUNTERED
GNA	GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
℄ CONST. SR 589	CENTERLINE CONSTRUCTION OF SR 589

NOTE:
1. BORING LOCATIONS WERE PROVIDED BY THE PROJECT SURVEYOR.
2. BORING LOCATIONS AND ELEVATIONS DENOTED WITH AN ASTERISK (*) WERE DETERMINED IN THE FIELD BY TIERRA USING HANDHELD GPS DEVICES AND USING PROJECT DESIGN FILES AND THEREFORE SHOULD BE CONSIDERED APPROXIMATE.

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

POND 2-5, ALT 1

DRAFT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-52-01

POND BORINGS

SHEET NO.

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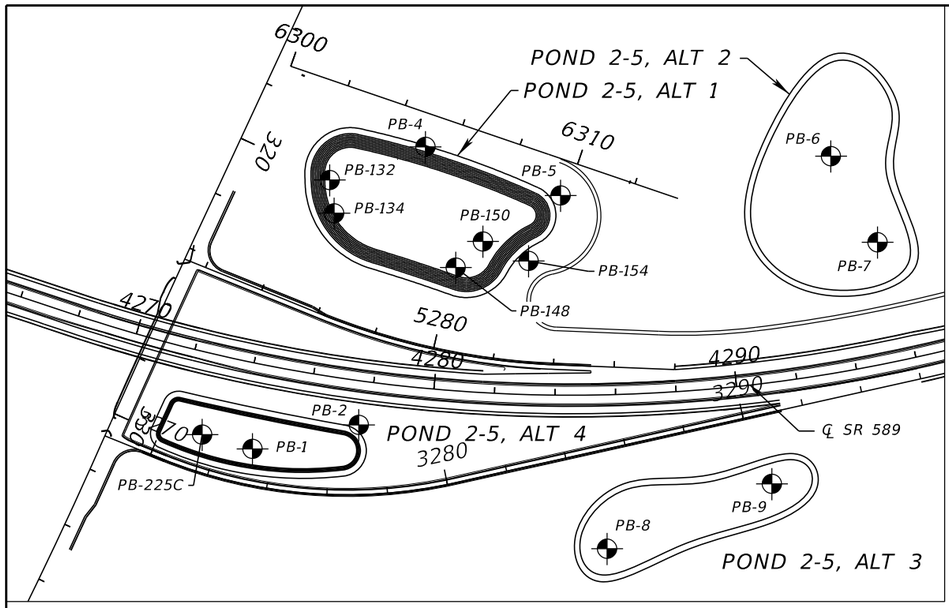
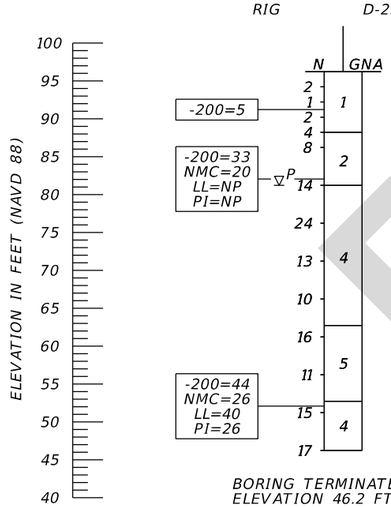


1" = 500'

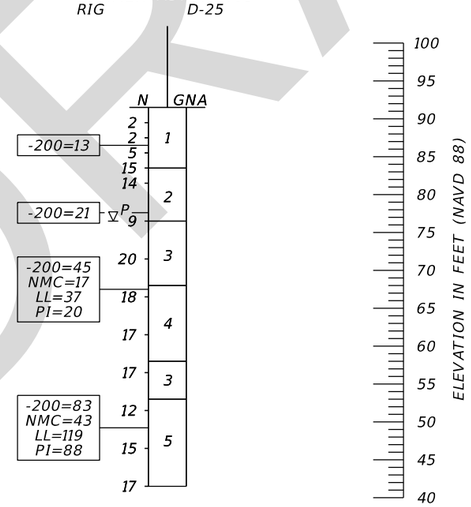
BORING LOCATION PLAN

BOR # PB-6
STA. 4294+51
REF. ℄ CONST. SR 589
OFF. 707' LT.
ELEV. 96.2
DATE 11/5/2019
DRILLER J. SMITH
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT
ELEVATION 46.2 FT (NAVD 88)

BOR # PB-7
STA. 4295+56
REF. ℄ CONST. SR 589
OFF. 398' LT.
ELEV. 91.5
DATE 11/5/2019
DRILLER J. SMITH
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT
ELEVATION 41.5 FT (NAVD 88)

LEGEND

1.	GRAY TO ORANGE-BROWN TO BROWN SAND TO SAND WITH SILT (A-3/A-2-4)
2.	GRAY TO ORANGE-BROWN TO BROWN SILTY SAND (A-2-4)
3.	GRAY TO ORANGE-BROWN CLAYEY SAND (A-2-6)
4.	GRAY TO ORANGE-BROWN TO RED-BROWN SANDY TO SILTY CLAY (A-4/A-6/A-7-6)
5.	BLUE-GRAY TO ORANGE-BROWN SANDY CLAY TO CLAY (A-7-5/A-7-6)
6.	LIMESTONE OCCASIONALLY LAYERED WITH CALCAREOUS CLAY
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
▼P	PERCHED GROUNDWATER TABLE ENCOUNTERED
▽P	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE IS A PERCHED CONDITION
GNE	GROUNDWATER NOT ENCOUNTERED
GNA	GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
℄ CONST. SR 589	CENTERLINE CONSTRUCTION OF SR 589

NOTE: 1. BORING LOCATIONS WERE PROVIDED BY THE PROJECT SURVEYOR.

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	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

POND 2-5, ALT 2

DRAFT

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-52-01

POND BORINGS

SHEET NO.

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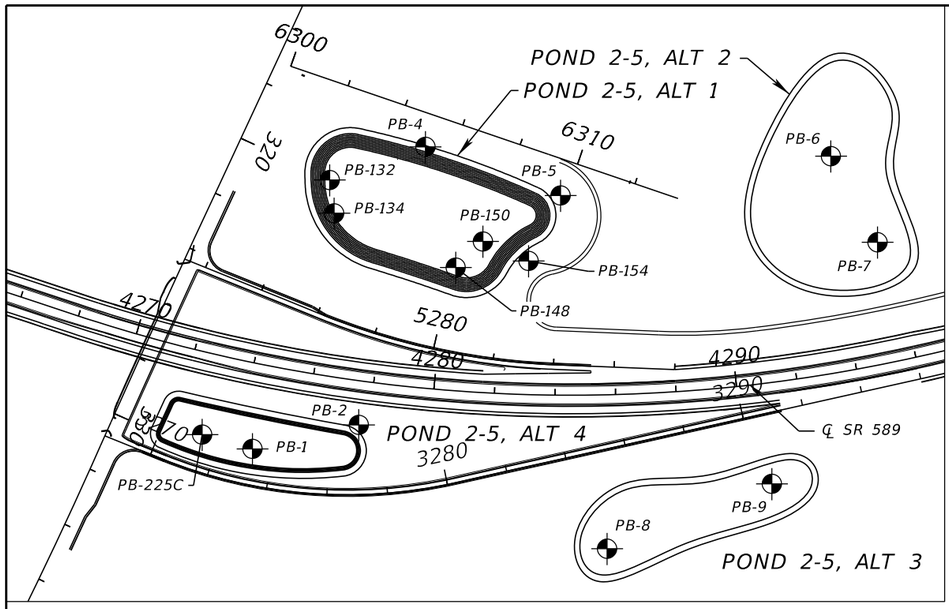
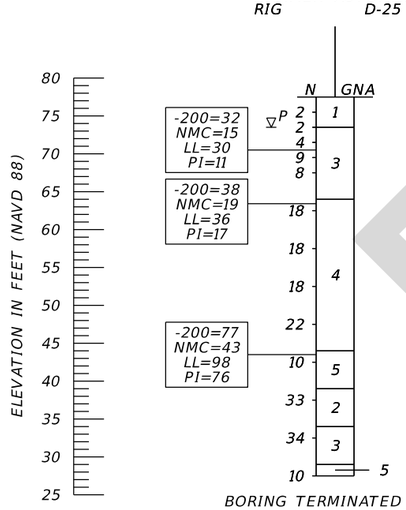


1" = 500'

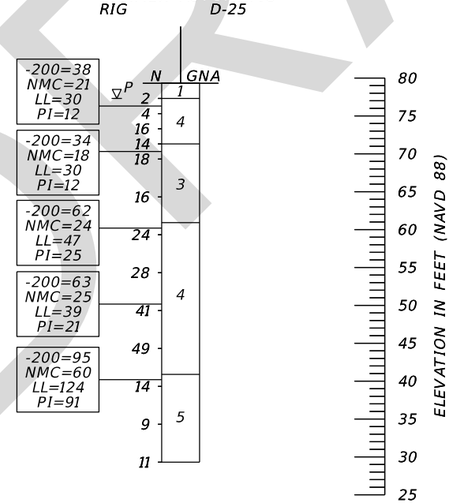
BORING LOCATION PLAN

BOR # PB-8
STA. 4285+62
REF. ℄ CONST. SR 589
OFF. 508' RT.
ELEV. 77.5
DATE 11/4/2019
DRILLER J. SMITH
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT
ELEVATION 27.5 FT (NAVD 88)

BOR # PB-9
STA. 4290+78
REF. ℄ CONST. SR 589
OFF. 332' RT.
ELEV. 79.3
DATE 11/4/2019
DRILLER J. SMITH
HAMMER AUTOMATIC
RIG D-25



BORING TERMINATED AT
ELEVATION 29.3 FT (NAVD 88)

LEGEND

1. GRAY TO ORANGE-BROWN TO BROWN SAND TO SAND WITH SILT (A-3/A-2-4)
2. GRAY TO ORANGE-BROWN TO BROWN SILTY SAND (A-2-4)
3. GRAY TO ORANGE-BROWN CLAYEY SAND (A-2-6)
4. GRAY TO ORANGE-BROWN TO RED-BROWN SANDY TO SILTY CLAY (A-4/A-6/A-7-6)
5. BLUE-GRAY TO ORANGE-BROWN SANDY CLAY TO CLAY (A-7-5/A-7-6)
6. LIMESTONE OCCASIONALLY LAYERED WITH CALCAREOUS CLAY

A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
▼P	PERCHED GROUNDWATER TABLE ENCOUNTERED
▽P	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE IS A PERCHED CONDITION
GNE	GROUNDWATER NOT ENCOUNTERED
GNA	GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
℄ CONST. SR 589	CENTERLINE CONSTRUCTION OF SR 589

NOTE:
1. BORING LOCATIONS WERE PROVIDED BY THE PROJECT SURVEYOR.
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	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

POND 2-5, ALT 3

DRAFT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-52-01

POND BORINGS

SHEET NO.

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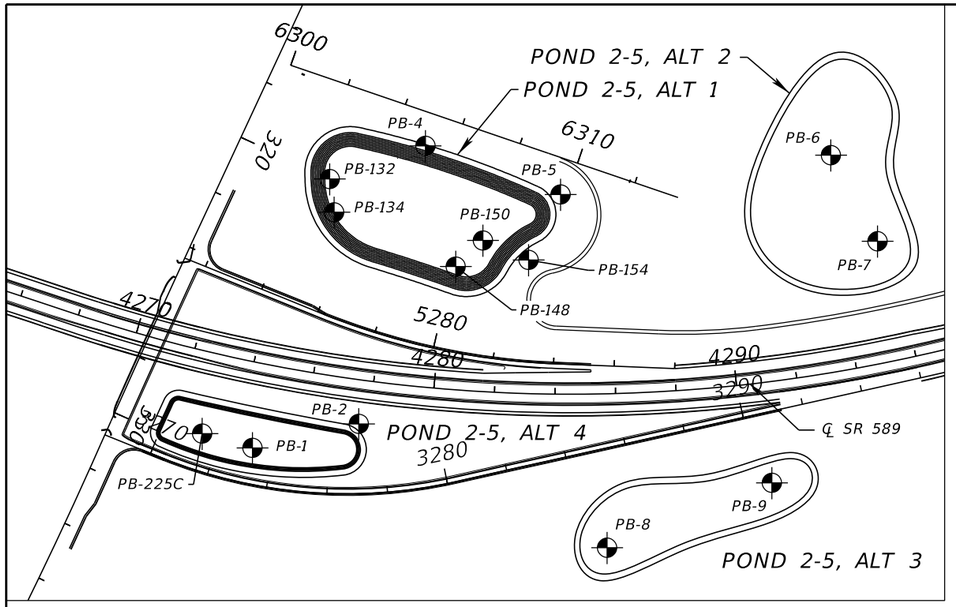
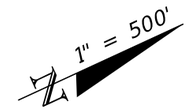
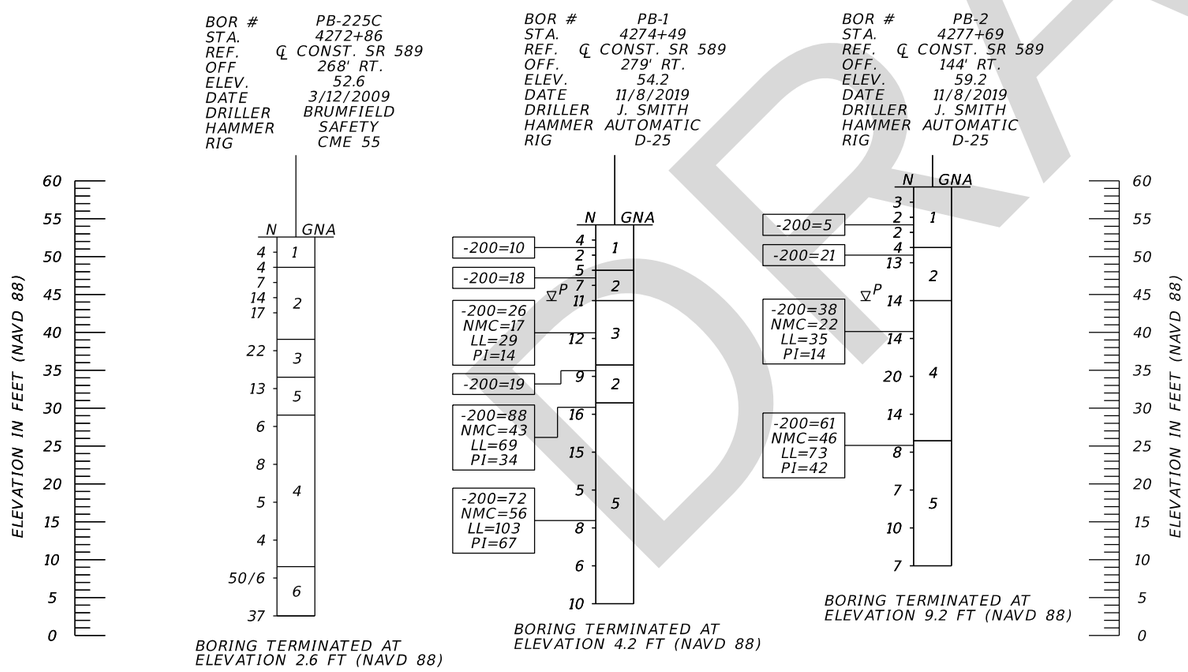


BORING LOCATION PLAN





LEGEND

1.	GRAY TO ORANGE-BROWN TO BROWN SAND TO SAND WITH SILT (A-3/A-2-4)
2.	GRAY TO ORANGE-BROWN TO BROWN SILTY SAND (A-2-4)
3.	GRAY TO ORANGE-BROWN CLAYEY SAND (A-2-6)
4.	GRAY TO ORANGE-BROWN TO RED-BROWN SANDY TO SILTY CLAY (A-4/A-6/A-7-6)
5.	BLUE-GRAY TO ORANGE-BROWN SANDY CLAY TO CLAY (A-7-5/A-7-6)
6.	LIMESTONE OCCASIONALLY LAYERED WITH CALCAREOUS CLAY
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
▼P	PERCHED GROUNDWATER TABLE ENCOUNTERED
▽P	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE IS A PERCHED CONDITION
GNE	GROUNDWATER NOT ENCOUNTERED
GNA	GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
℄ CONST. SR 589	CENTERLINE CONSTRUCTION OF SR 589

NOTE:
1. BORING LOCATIONS WERE PROVIDED BY THE PROJECT SURVEYOR.
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	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS-RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

POND 2-5, ALT 4

DRAFT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-52-01

POND BORINGS

SHEET NO.

9/23/2020 6:19:19 PM bsawaska
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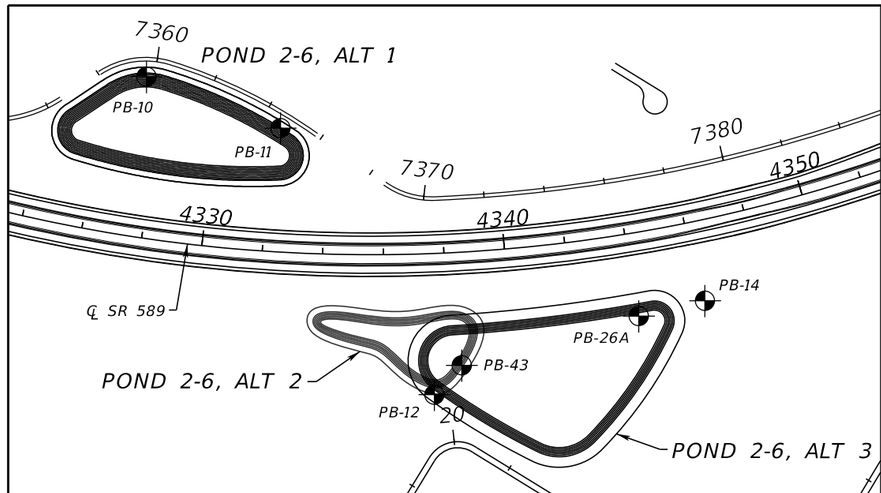

BORING LOCATION PLAN

1" = 500'

LEGEND

1.	GRAY TO ORANGE-BROWN TO BROWN SAND TO SAND WITH SILT (A-3/A-2-4)
2.	GRAY TO ORANGE-BROWN TO BROWN SILTY SAND (A-2-4)
3.	GRAY TO ORANGE-BROWN CLAYEY SAND (A-2-6)
4.	GRAY TO ORANGE-BROWN TO RED-BROWN SANDY TO SILTY CLAY (A-4/A-6/A-7-6)
5.	BLUE-GRAY TO ORANGE-BROWN SANDY CLAY TO CLAY (A-7-5/A-7-6)
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HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
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PI	PLASTICITY INDEX (%)
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NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
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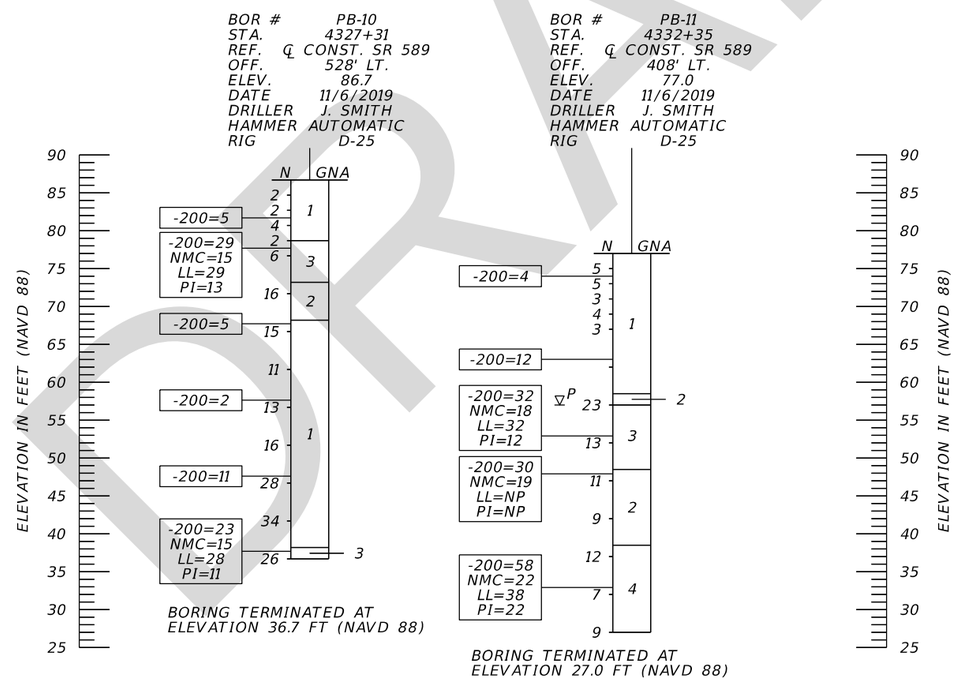

	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

POND 2-6, ALT 1

DRAFT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-52-01

POND BORINGS

SHEET NO.

9/23/2020 6:22:15 PM bsawaska
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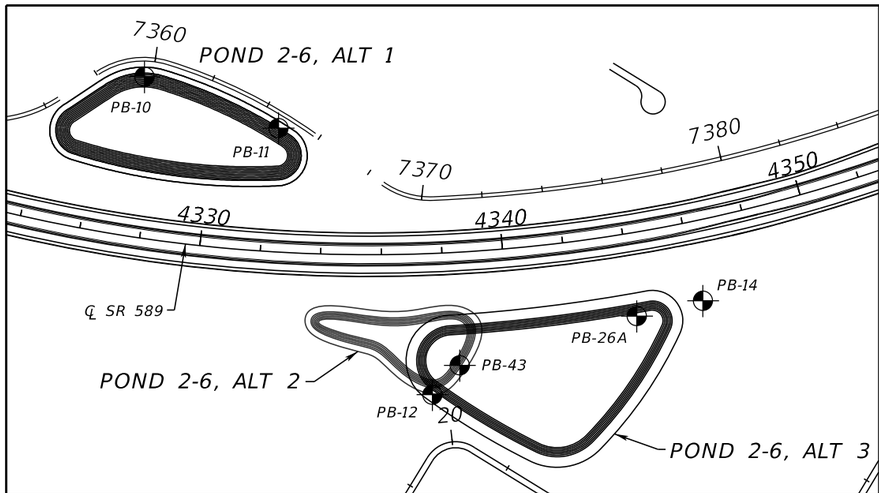


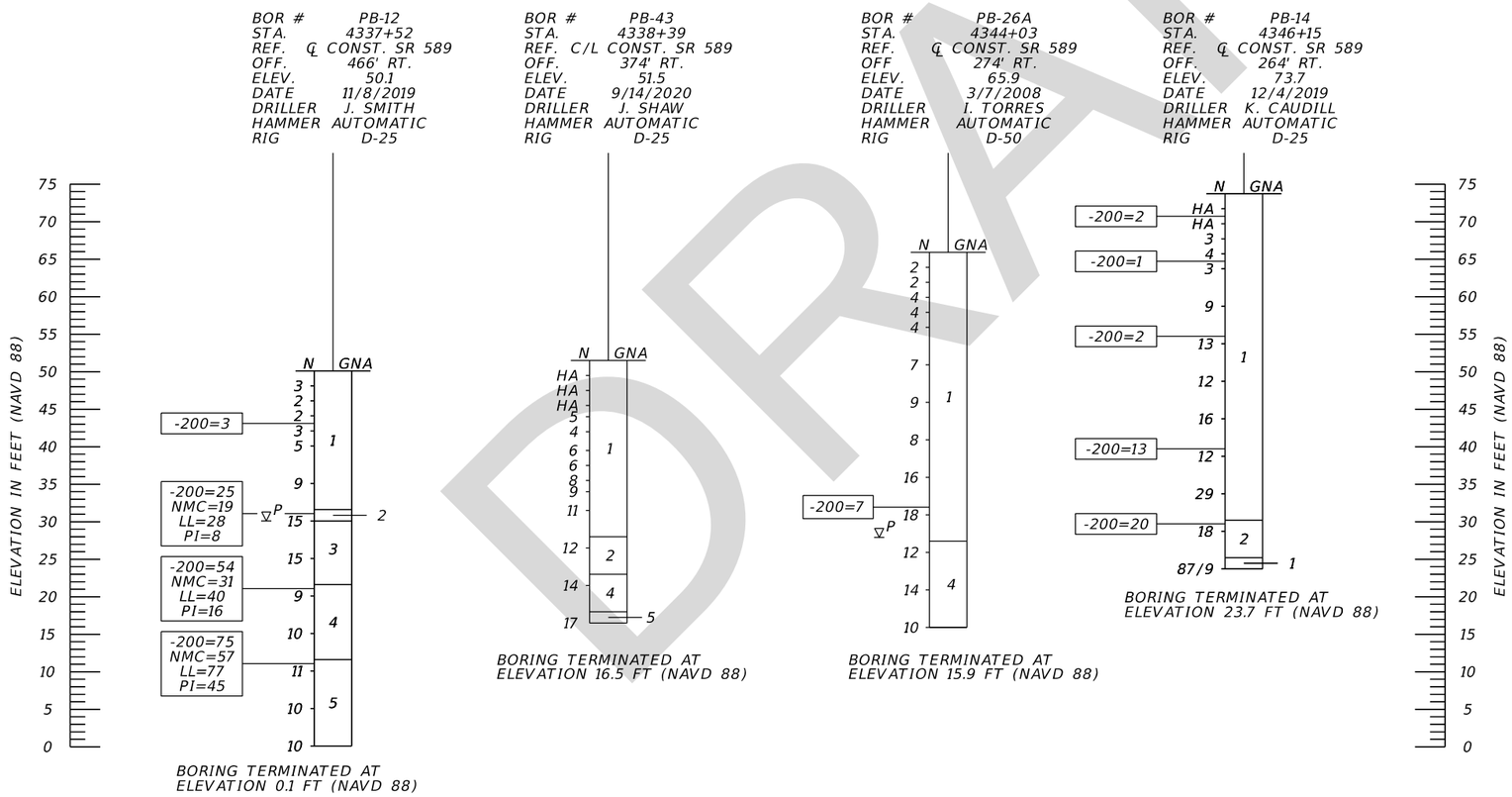
BORING LOCATION PLAN

1" = 500'

LEGEND

1.	GRAY TO ORANGE-BROWN TO BROWN SAND TO SAND WITH SILT (A-3/A-2-4)
2.	GRAY TO ORANGE-BROWN TO BROWN SILTY SAND (A-2-4)
3.	GRAY TO ORANGE-BROWN CLAYEY SAND (A-2-6)
4.	GRAY TO ORANGE-BROWN TO RED-BROWN SANDY TO SILTY CLAY (A-4/A-6/A-7-6)
5.	BLUE-GRAY TO ORANGE-BROWN SANDY CLAY TO CLAY (A-7-5/A-7-6)
6.	LIMESTONE OCCASIONALLY LAYERED WITH CALCAREOUS CLAY
A-3	AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.
N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
▼P	PERCHED GROUNDWATER TABLE ENCOUNTERED
▽P	ESTIMATED SEASONAL HIGH GROUNDWATER TABLE IS A PERCHED CONDITION
GNE	GROUNDWATER NOT ENCOUNTERED
GNA	GROUNDWATER NOT APPARENT DUE TO THE INTRODUCTION OF DRILLING FLUID.
℄ CONST. SR 589	CENTERLINE CONSTRUCTION OF SR 589

NOTE:
1. BORING LOCATIONS WERE PROVIDED BY THE PROJECT SURVEYOR.
2. BORING LOCATIONS AND ELEVATIONS DENOTED WITH AN ASTERISK (*) WERE DETERMINED IN THE FIELD BY TIERRA USING HANDHELD GPS DEVICES AND USING PROJECT DESIGN FILES AND THEREFORE SHOULD BE CONSIDERED APPROXIMATE.



	SAFETY HAMMER	AUTOMATIC HAMMER
GRANULAR MATERIALS- RELATIVE DENSITY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY LOOSE	LESS THAN 4	LESS THAN 3
LOOSE	4 to 10	3 to 8
MEDIUM DENSE	10 to 30	8 to 24
DENSE	30 to 50	24 to 40
VERY DENSE	GREATER THAN 50	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT N-VALUE (BLOWS/FT.)	SPT N-VALUE (BLOWS/FT.)
VERY SOFT	LESS THAN 2	LESS THAN 1
SOFT	2 to 4	1 to 3
FIRM	4 to 8	3 to 6
STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

POND 2-6, ALT 2 & POND 2-6, ALT 3

DRAFT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-52-01

POND BORINGS

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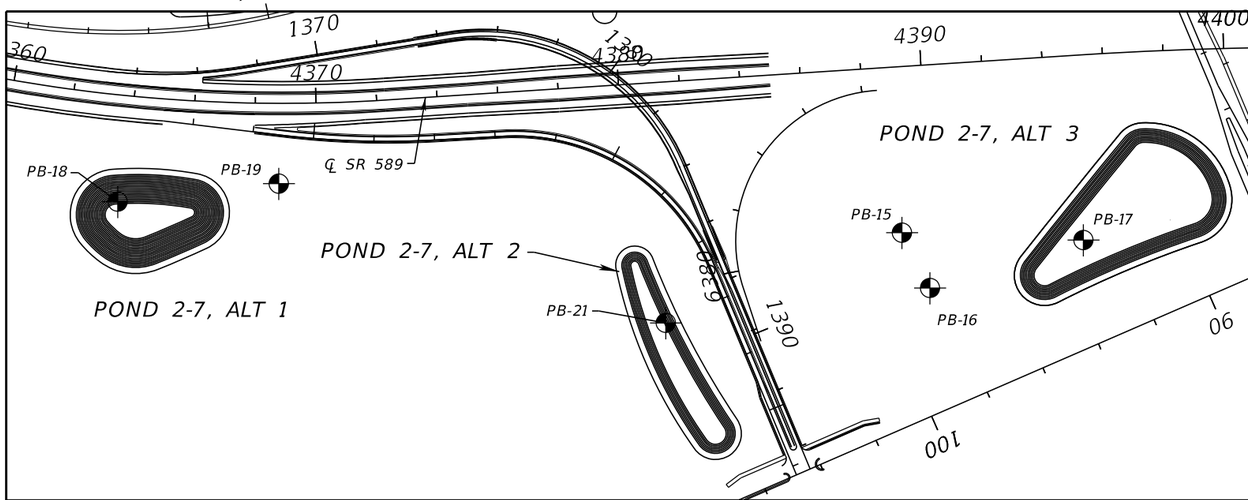
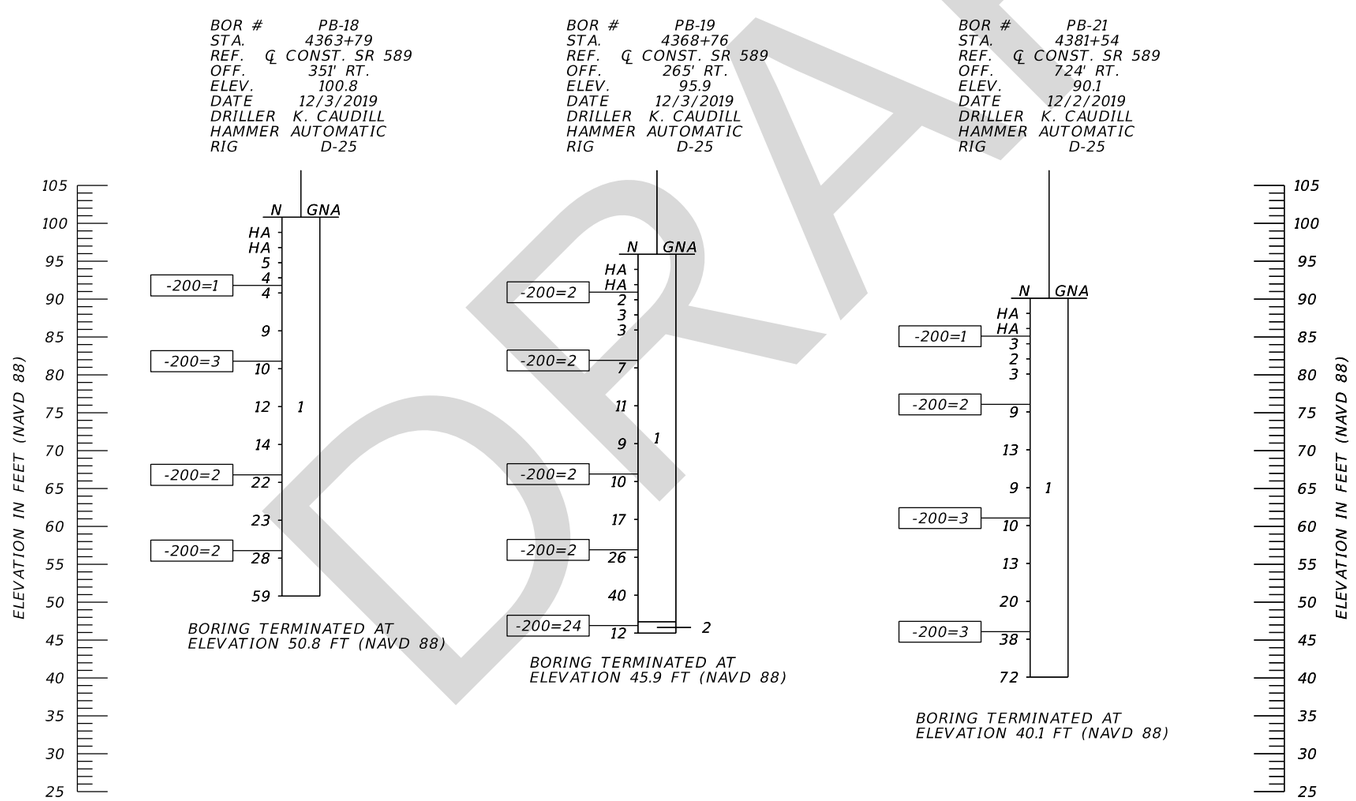


BORING LOCATION PLAN



LEGEND

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N	NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED).
50/4	NUMBER OF BLOWS FOR 4 INCHES OF PENETRATION
HA	HAND AUGERED TO VERIFY UTILITY CLEARANCE
-200	PERCENT PASSING #200 SIEVE
NMC	NATURAL MOISTURE CONTENT (%)
LL	LIQUID LIMIT (%)
PI	PLASTICITY INDEX (%)
NP	NON-PLASTIC
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988
⊕	APPROXIMATE SPT BORING LOCATION
▼P	PERCHED GROUNDWATER TABLE ENCOUNTERED
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GNE	GROUNDWATER NOT ENCOUNTERED
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℄ CONST. SR 589	CENTERLINE CONSTRUCTION OF SR 589

NOTE:
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STIFF	8 to 15	6 to 12
VERY STIFF	15 to 30	12 to 24
HARD	GREATER THAN 30	GREATER THAN 24

POND 2-7, ALT 1 & POND 2-7, ALT 2

DRAFT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-52-01

POND BORINGS

SHEET NO.

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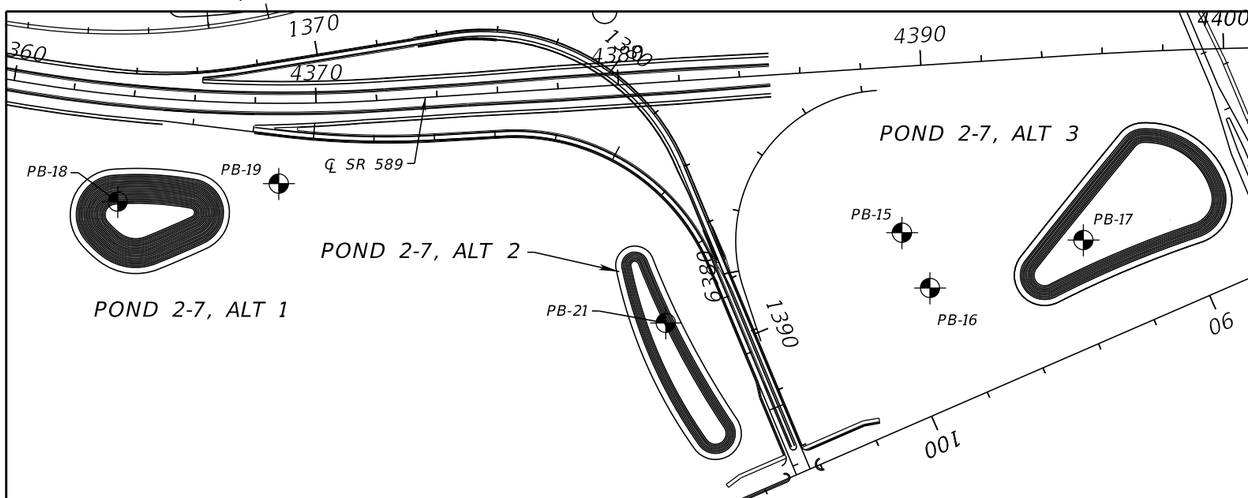
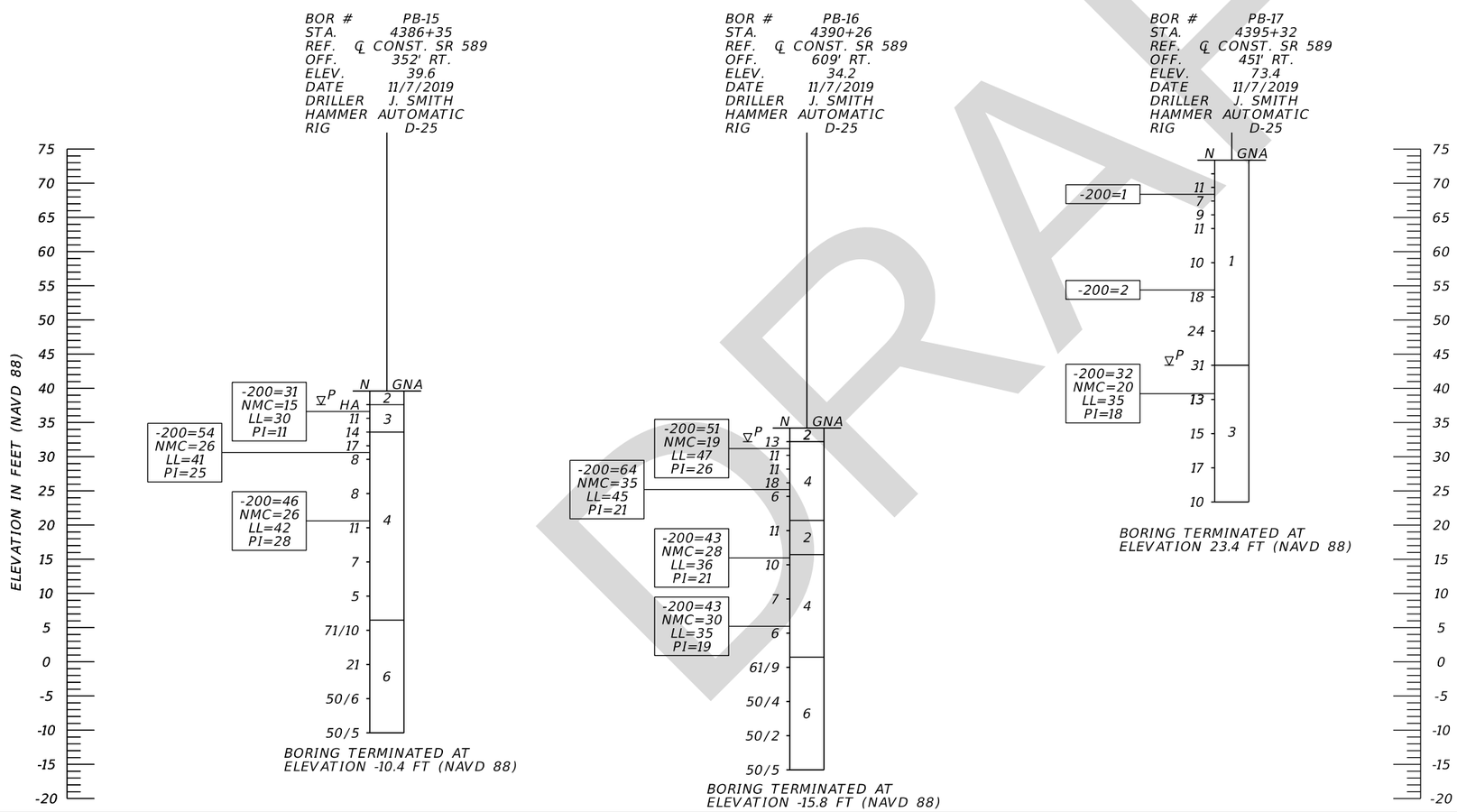


BORING LOCATION PLAN



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POND 2-7, ALT 3

DRAFT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MARC E. NOVAK, Ph.D., P.E.
P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-52-01

POND BORINGS

SHEET NO.

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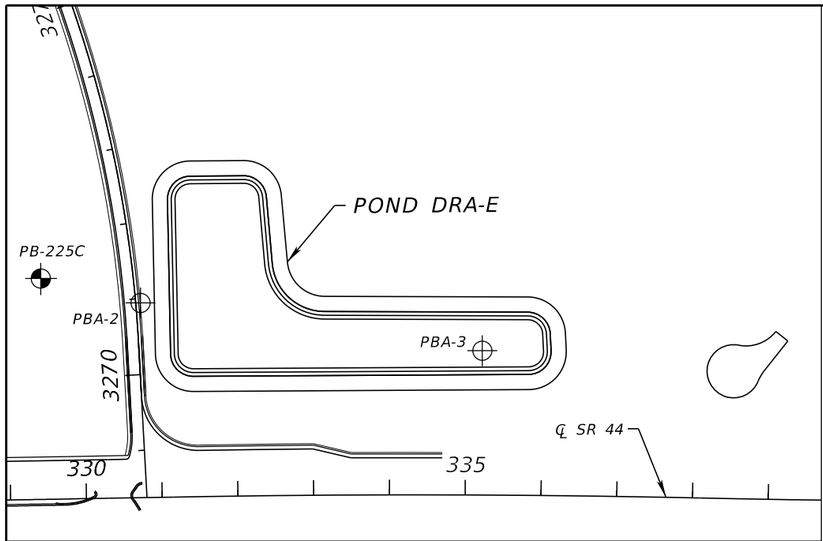

BORING LOCATION PLAN

1" = 200'

LEGEND

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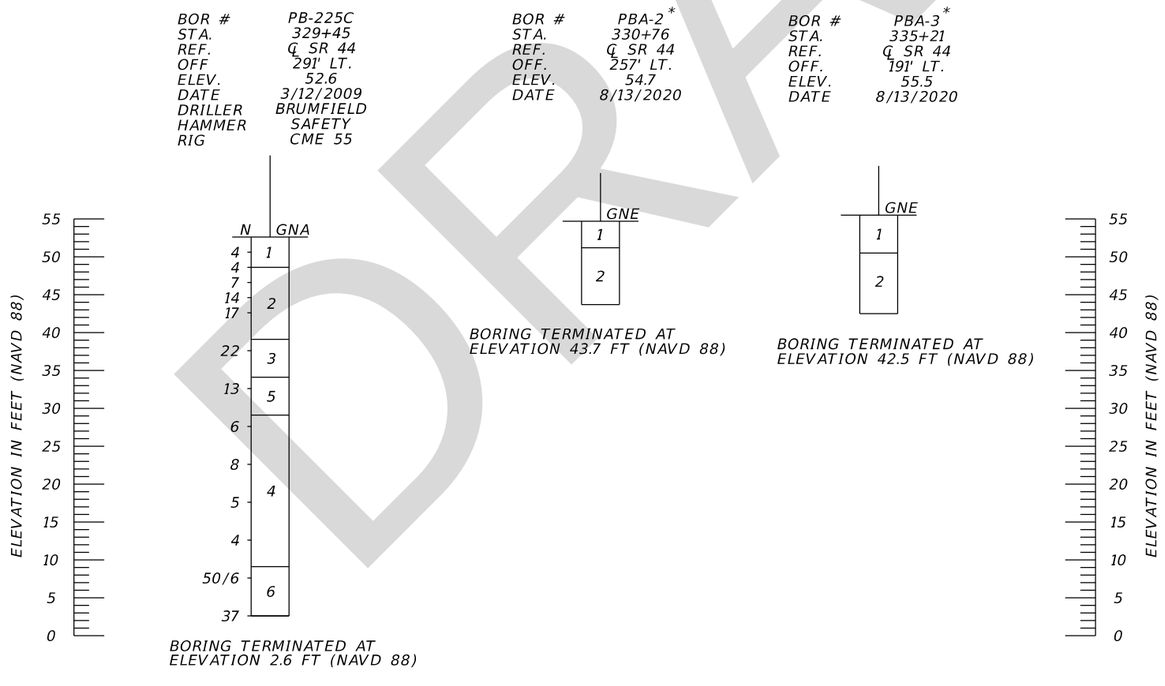

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HARD	GREATER THAN 30	GREATER THAN 24

POND DRA-E

DRAFT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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P.E. LICENSE NUMBER 67431
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-52-01

POND BORINGS

SHEET NO.

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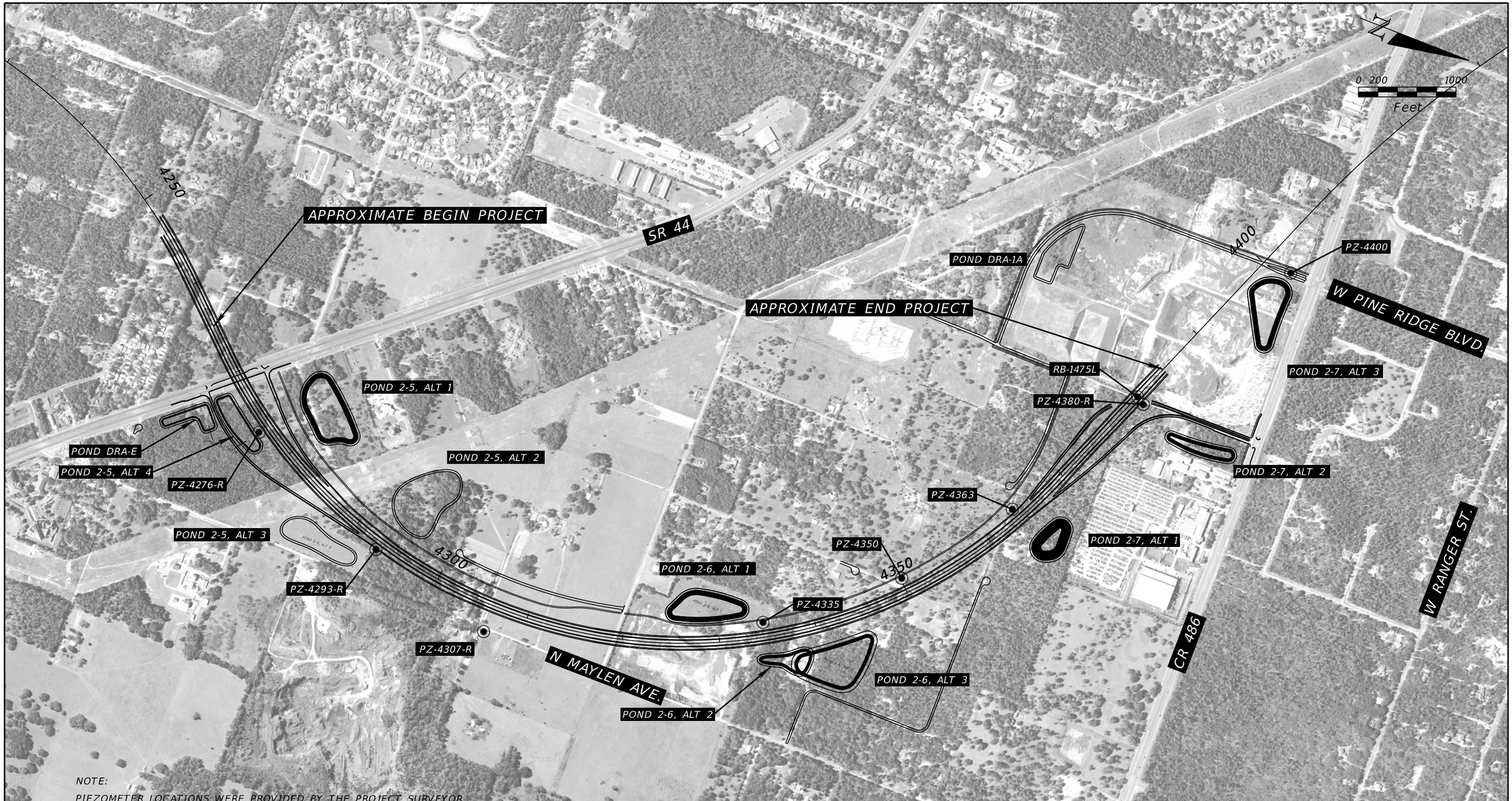

LEGEND

◉ APPROXIMATE PIEZOMETER LOCATION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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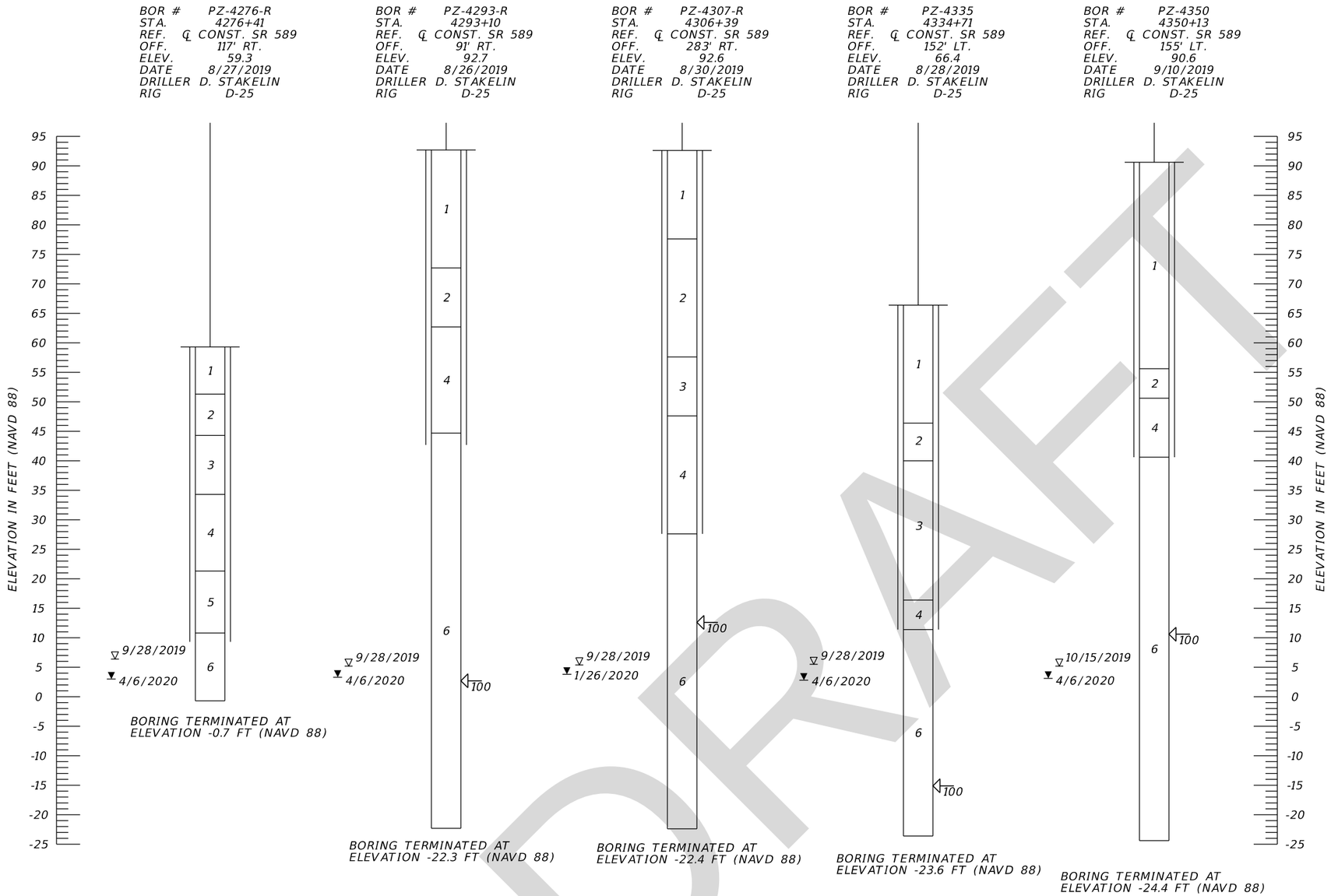
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 589	CITRUS	442764-1-32-01

TEMPORARY PIEZOMETER LOCATION PLAN

SHEET NO.



LEGEND

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A-3 — AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW.

NAVD 88 — NORTH AMERICAN VERTICAL DATUM OF 1988

100 — LOSS OF CIRCULATION OF DRILLING FLUID (%)

CASING

GNE — GROUNDWATER NOT ENCOUNTERED TO AN ELEVATION OF +5.5

10/15/2019 — HIGHEST GROUNDWATER LEVEL MEASURED IN PIEZOMETER DURING MONITORING PERIOD (OCTOBER 15, 2019)

4/6/2020 — LOWEST GROUNDWATER LEVEL MEASURED IN PIEZOMETER DURING MONITORING PERIOD (APRIL 6, 2020)

℄ CONST. SR 589 — CENTERLINE CONSTRUCTION OF SR 589

NOTES:

1. PIEZOMETER LOCATIONS WERE PROVIDED BY THE PROJECT SURVEYOR.
2. STRATA BREAKS WERE ESTIMATED FROM DRILL CUTTINGS DURING ROTARY WASH BORINGS AND SHALL BE CONSIDERED APPROXIMATE.

DRAFT

REVISIONS			
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SR 589	CITRUS	442764-1-52-01

TEMPORARY PIEZOMETER PROFILES (1)

SHEET NO.

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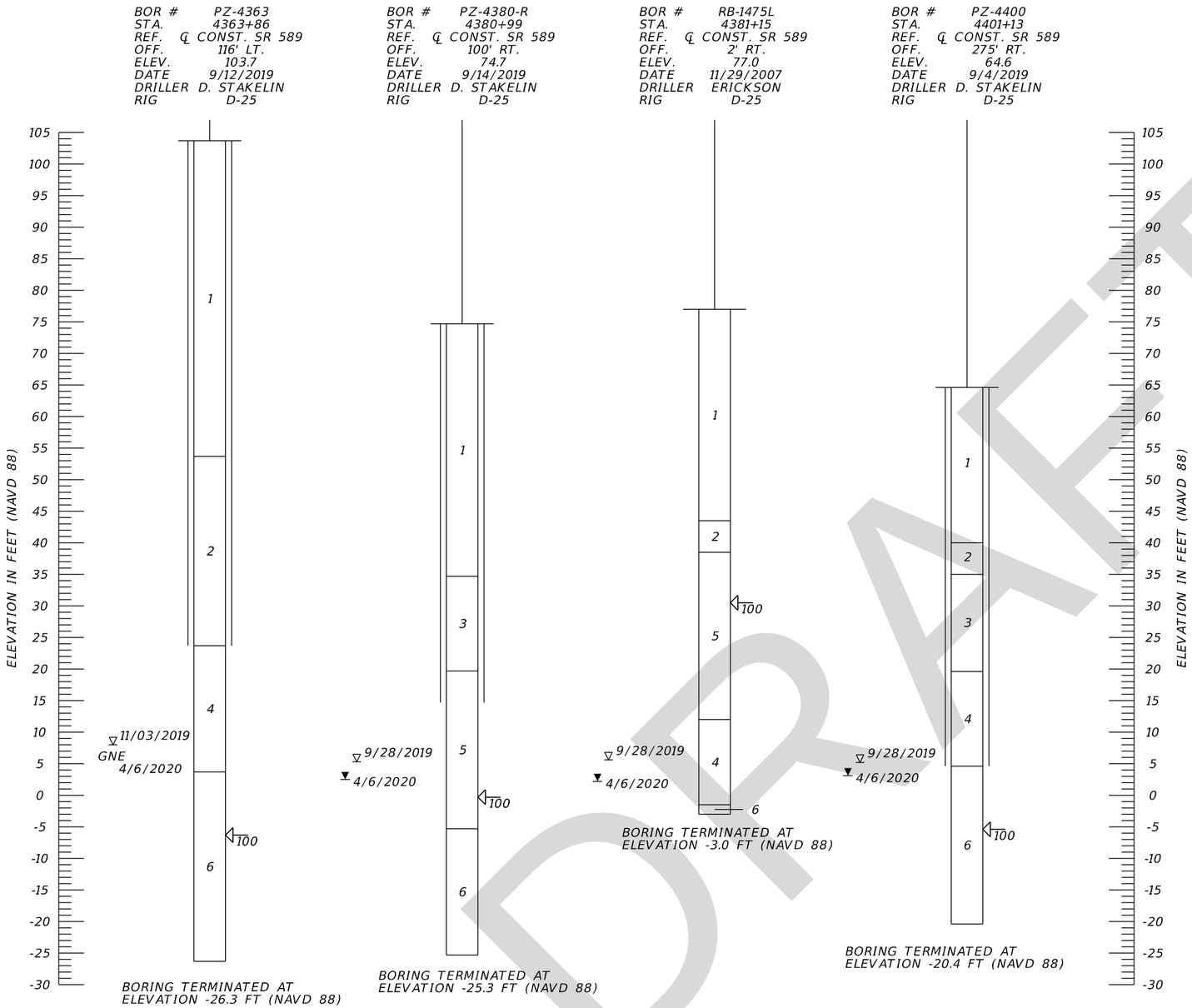

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	CASING
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10/15/2019	HIGHEST GROUNDWATER LEVEL MEASURED IN PIEZOMETER DURING MONITORING PERIOD (OCTOBER 15, 2019)
4/6/2020	LOWEST GROUNDWATER LEVEL MEASURED IN PIEZOMETER DURING MONITORING PERIOD (APRIL 6, 2020)
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DRAFT

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SR 589	CITRUS	442764-1-52-01

TEMPORARY PIEZOMETER PROFILES (2)

SHEET NO.

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Summary of Groundwater Table Measurements from Piezometers
SR 589 (Suncoast Parkway 2) from SR 44 to CR 486
Citrus County, Florida
FPN: 442764-1-32-01
Tierra Project No.: 6511-18-108

PIEZOMETER BORING IDENTIFICATION	PIEZOMETER LOCATION[1]		PIEZOMETER LOCATION[1]		GROUND ELEVATION[2] (feet, NAVD88)	GROUNDWATER ELEVATION[3] (feet, NAVD88)									
	EASTING	NORTHING	STATION (feet)	OFFSET (feet)		09/28/19	10/15/19	11/03/19	11/23/19	12/09/19	01/26/20	04/06/20	06/21/20	07/13/20	08/29/20
PZ-4276-R	493612	1647890	4276 + 41	117' RT.	59.3	6.4	5.3	5.0	4.4	4.3	3.7	3.0	3.1	3.1	3.3
PZ-4293-R	494294	1649443	4293 + 10	91' RT.	92.7	5.3	5.2	5.0	4.6	4.4	3.9	3.3	3.0	3.1	3.5
PZ-4307-R	494675	1650775	4306 + 39	283' RT.	92.6	5.4	5.2	4.9	4.6	4.4	3.8	---[5]	---[5]	---[5]	---[5]
PZ-4335	493545	1653406	4334 + 71	152' LT.	66.4	5.5	5.2	4.7	4.6	4.3	3.9	2.8	---	---	3.5
PZ-4350	492607	1654565	4350 + 13	155' LT.	90.6	5.1	5.2	4.8	4.5	4.3	3.7	3.1	3.1	3.0	3.4
PZ-4363	491538	1655363	4363 + 86	116' LT.	103.7	6.9	7.6	8.0	7.5	7.0	<5.5[4]	<5.5[4]	<5.5[4]	<5.5[4]	<5.5[4]
PZ-4380-R	490050	1656222	4380 + 99	100' RT.	74.7	5.3	5.2	4.9	4.6	4.3	3.6	2.5	2.8	---[5]	---[5]
RB-1475L	489998	1656137	4381 + 15	2' RT.	77.0	5.6	5.4	3.4	4.6	2.7	2.2	2.2	2.9	3.0	3.3
PZ-4400	488248	1657139	4401 + 13	275' RT.	64.6	5.2	5.1	4.7	4.5	4.2	3.6	3.1	3.0	3.1	3.5

[1] State Plane coordinates of the piezometer locations were provided by the project surveyor. The coordinates were then converted to Station and Offset using Microstation design files provided by WBQ.

[2] Ground elevations were provided by the project surveyor.

[3] Groundwater elevations calculated by subtracting the depth to the groundwater from the surveyed ground elevation.

[4] Groundwater not encountered to elevation shown.

[5] Piezometer was removed or destroyed.

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APPENDIX E

Pond Site Evaluation Matrix

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Table E1 - Pond Site Evaluation Matrix for Basin 2-5

PROJECT: Suncoast 2, Section 2 PREPARED: HMT DATE: 10/12/2020

LOCATION: CITRUS COUNTY, FLORIDA CHECKED: DATE:

	EVALUATION CRITERIA	POND 2-5 ALT 1	POND 2-5 ALT 2	POND 2-5 ALT 3	POND 2-5 ALT 4	POND DRA-E
General	Location	Northwest quadrant of the SR 44/SR 589 interchange. Sta. 4274+40 to Sta. 4283+50	Northwest of SR 44/SR 589 interchange. North of Duke Energy ROW. Sta. 4290+95 to Sta. 4296+88	Northeast of the SR 44/SR 589 interchange. Sta. 4284+63 to Sta. 4292+23	Infield pond within the SR 44/SR 589 interchange Sta. 4271+19 to Sta. 4277+50	Located on the southeastern side of SR 44/SR 589 interchange Sta. 330+20 to Sta. 339+00
	Treatment Method	Dry Retention	Dry Retention	Dry Retention	Dry Retention	Dry Retention
	Pre-Treatement Required	No	No	No	No	No
Pond Areas	Pond Area (AC)	7.17	7.77	4.30	2.21	4.56
	Drainage Easement Area (AC)	N/A	N/A	N/A	N/A	N/A
Soils and Land Use	Soils Name	Candler, Kendrick	Arredondo	Candler, Sparr	Kendrick, Candler	Kendrick, Spar
	Soils Description	Fine sand	Fine sand	Fine sand	Fine sand	Fine Sand
	Hydrological Group	A	A	A	A	A
	Land Use	Residential and undeveloped woods	Undeveloped woods	Cleared undeveloped land with isolated trees	Wooded with some open space	Cleared undeveloped land with isolated trees
Cultural and Environmental Impacts	Recorded Archeological/Historic Sites	8CI1026 (NRHP - ineligible)	8CI1027 (NRHP - ineligible)	None	None	None
	Protected Species Involvement	High	High	High	High	High
	Protected Species Impacts	Moderate	Moderate	Low	Moderate	Low
	Cultural Impact Potential	Low	Low	Low	Low	Low
	Wetland Involvement	No	No	No	No	No
Costs	ROW Cost	$252,263	$480,247	$705,035	-	$1,097,779
	Construction Cost	$646,370	$456,800	$221,626	$204,569	$229,057
	Total Cost	$898,633	$937,047	$926,661	$204,569	$1,326,836
Misc.	Contamination Risk Potential	Low	Low	Low	None	None
	Utility Impacts	Telephone Lines, Electric Line	-	-	-	-
	Construction Feasibility	Good	Good	Good	Good	Good
	Pond Site Rating	**GOOD**	**FAIR**	**FAIR**	**GOOD**	**GOOD**
	Pond Site Ranking	**#1**	**#2**	**#3**	**#1**	**#1**

LEGEND

	Preferred Pond Site
	Alternate Pond Site

DRAFT

Table E2 - Pond Site Evaluation Matrix for Basin 2-6

PROJECT: Suncoast 2, Section 2 PREPARED: HMT DATE: 10/12/2020

LOCATION: CITRUS COUNTY, FLORIDA CHECKED: DATE:

	EVALUATION CRITERIA	POND 2-6 ALT 1	POND 2-6 ALT 2	POND 2-6 ALT 3
General	Location	North of W Sanction Road Sta. 4324+60 to Sta. 4333+00	North of W Sanction Road Sta. 4290+95 to Sta. 4296+88	North of W Sanction Road Sta. 4337+00 to Sta. 4346+00
	Treatment Method	Dry Retention	Dry Retention	Dry Retention
	Pre-Treatement Required	No	No	No
Pond Areas	Pond Area (AC)	5.41	2.48	8.21
	Drainage Easement Area (AC)	N/A	N/A	N/A
Soils and Land Use	Soils Name	Candler	Arredondo	Candler
	Soils Description	Fine sand	Fine sand	Fine sand
	Hydrological Group	A	A	A
	Land Use	Open space, existing quarry	Undeveloped woods	Open space, sparce woods
Cultural and Environmental Impacts	Recorded Archeological/Historic Sites	None	None	None
	Protected Species Involvement	High	Low	Low
	Protected Species Impacts	Low	Low	Low
	Cultural Impact Potential	Low	Low	Low
	Wetland Involvement	No	No	No
Costs	ROW Cost	$190,314	$142,115	$445,386
	Construction Cost	$331,593	$115,168	$500,413
	Total Cost	$521,907	$257,283	$945,799
Misc.	Contamination Risk Potential	Low	Low	Medium
	Utility Impacts	-	-	-
	Construction Feasibility	Good	Good	Good
	Pond Site Rating	**FAIR**	**FAIR**	**GOOD**
	Pond Site Ranking	**#1**	**#2**	**#1**

LEGEND

	Preferred Pond Site
	Alternate Pond Site

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Table E3 - Pond Site Evaluation Matrix for Basin 2-7

PROJECT: Suncoast 2, Section 2 PREPARED: HMT DATE: 10/12/2020

LOCATION: CITRUS COUNTY, FLORIDA CHECKED: DATE:

	EVALUATION CRITERIA	POND 2-7 ALT 1	POND 2-7 ALT 2	POND 2-7 ALT 3
General	Location	South of Knoll Road Sta. 4361+70 to Sta. 4367+50	SR 589/Knoll Road interchange Sta. 4377+13 to Sta. 4383+83	North of the proposed SR 589/Knoll Road interchange Sta. 4391+00 to Sta. 4400+20
	Treatment Method	Dry Retention	Dry Retention	Dry Retention
	Pre-Treatement Required	No	No	No
Pond Areas	Pond Area (AC)	3.30	2.98	5.64
	Drainage Easement Area (AC)	N/A	N/A	N/A
Soils and Land Use	Soils Name	Candler, Astatula	Candler, Astatula	Candler, Astatula
	Soils Description	Fine sand	Fine sand	Fine sand
	Hydrological Group	A	A	A
	Land Use	Undeveloped woods	Undeveloped woods	Existing open cut sand mine
Cultural and Environmental Impacts	Recorded Archeological/Historic Sites	None	None	None
	Protected Species Involvement	High	High	Low
	Protected Species Impacts	Low	Low	Low
	Cultural Impact Potential	Low	Low	Low
	Wetland Involvement	No	No	No
Costs	ROW Cost	$170,302	$236,053	-
	Construction Cost	$264,367	$128,294	$479,363
	Total Cost	$434,669	$364,347	$479,363
Misc.	Contamination Risk Potential	Low	Low	Low
	Utility Impacts	-	-	Telephone Line, Water Supply Pipeline
	Construction Feasibility	Good	Good	Good
	Pond Site Rating	**GOOD**	**GOOD**	**GOOD**
	Pond Site Ranking	**#1**	**#2**	**#2**

LEGEND

	Preferred Pond Site
	Alternate Pond Site

Table E3 - Pond Site Evaluation Matrix for Basin 2-7

PROJECT: Suncoast 2, Section 2 PREPARED: HMT DATE: 10/12/2020

LOCATION: CITRUS COUNTY, FLORIDA CHECKED: DATE:

EVALUATION CRITERIA		POND DRA-1A
General	Location	North of the proposed SR 589/Knoll Road interchange Sta. 4385+34 to Sta. 4397+59
	Treatment Method	Dry Retention
	Pre-Treatement Required	No
Pond Areas	Pond Area (AC)	
	Drainage Easement Area (AC)	N/A
Soils and Land Use	Soils Name	Candler, Astatula
	Soils Description	Fine sand
	Hydrological Group	A
	Land Use	Existing open cut sand mine
Cultural and Environmental Impacts	Recorded Archeological/Historic Sites	None
	Protected Species Involvement	Low
	Protected Species Impacts	Low
	Cultural Impact Potential	Low
	Wetland Involvement	No
Costs	ROW Cost	-
	Construction Cost	$76,094
	Total Cost	$76,094
Misc.	Contamination Risk Potential	Medium
	Utility Impacts	Telephone Line, Water Supply Pipeline
	Construction Feasibility	Good
	Pond Site Rating	**GOOD**
	Pond Site Ranking	**#1**

LEGEND

	Preferred Pond Site
	Alternate Pond Site

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APPENDIX F

Previous Permit Information

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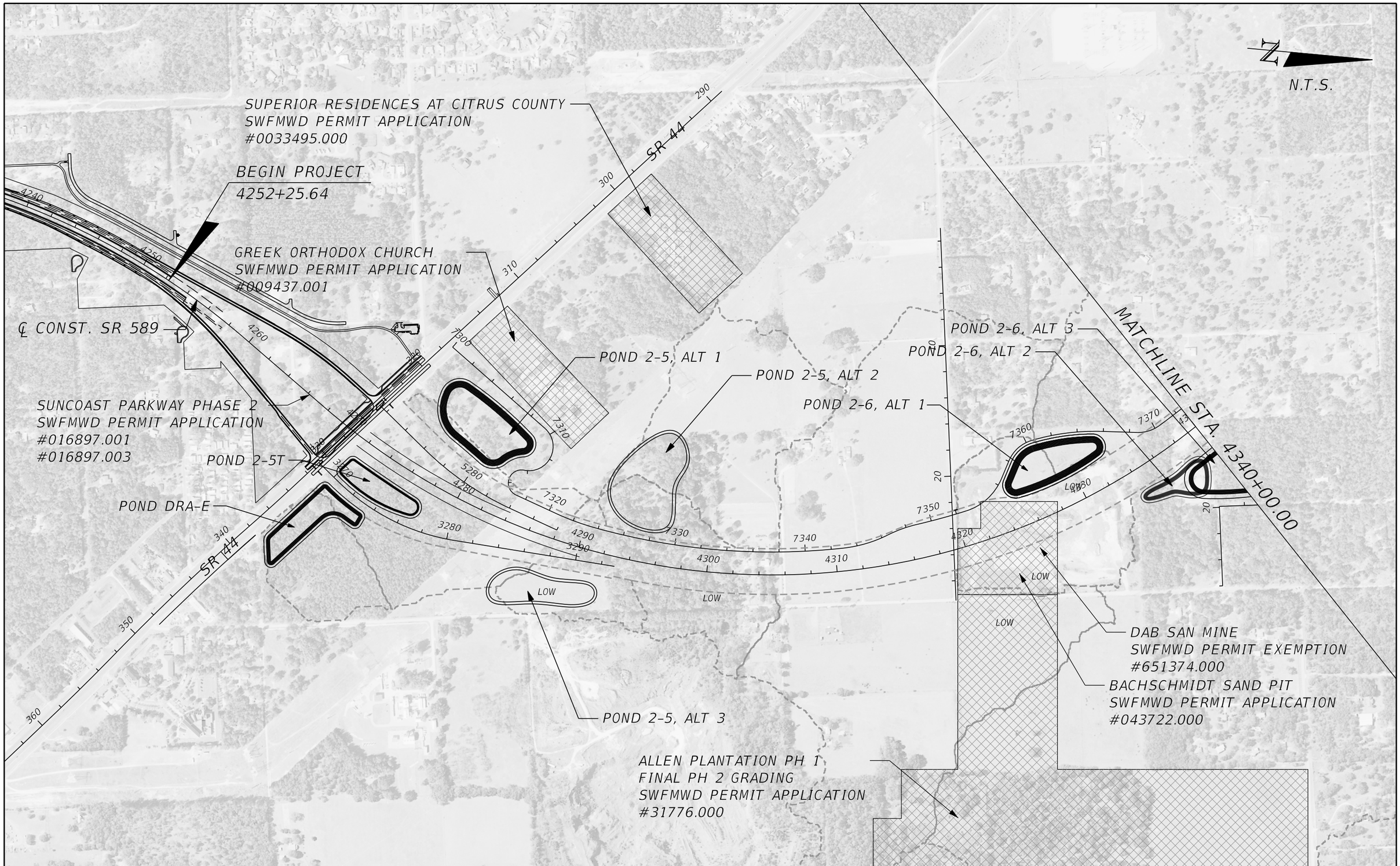


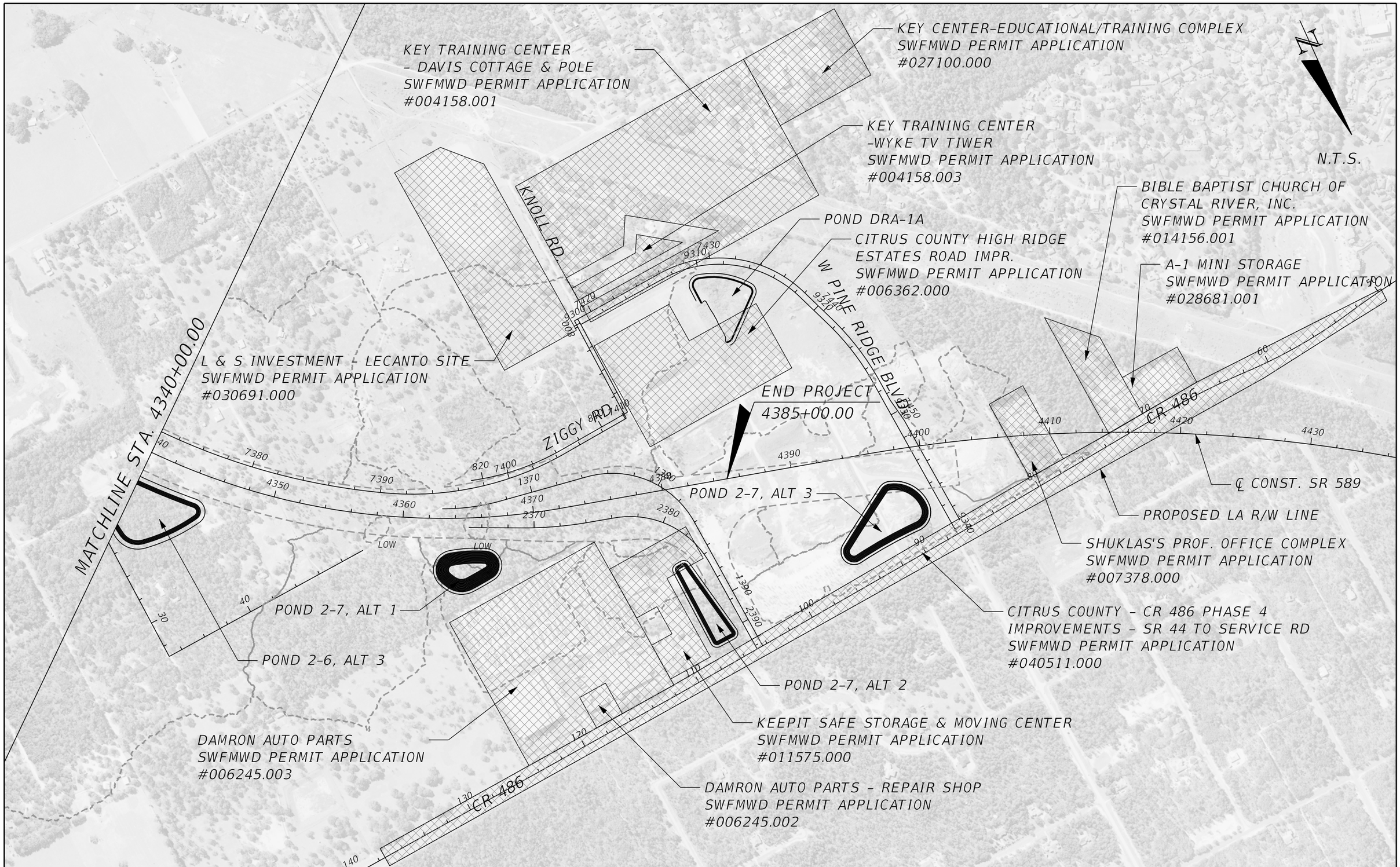
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

WBQ DESIGN & ENGINEERING, INC.
CERTIFICATE OF AUTHORIZATION NO. 6796
201 N. MAGNOLIA AVE.
SUITE 200
ORLANDO, FL 32801
TROY W. VARGAS, P.E. LICENSE NO. 57621

SUNCOAST PARKWAY 2
FPID 442764-1-52-01
POND SITING REPORT

PERMIT INVOLVEMENT (1)

EXHIBIT NO.
F-1



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

WBQ DESIGN & ENGINEERING, INC.
CERTIFICATE OF AUTHORIZATION NO. 6796
201 N. MAGNOLIA AVE.
SUITE 200
ORLANDO, FL 32801
TROY W. VARGAS, P.E. LICENSE NO. 57621

SUNCOAST PARKWAY 2
FPID 442764-1-52-01
POND SITING REPORT

PERMIT INVOLVEMENT (2)

EXHIBIT NO.
F-2

amoreno 10/12/2020 6:50:18 PM Exisiting Basins P:\19TUR_SUN2\44_486\4427641520I\drainage\DRDTRD06.dgn

Suncoast Parkway 2 Involved Permits

Project Name	Permit No.	Type	Description	Status	Station	Involvement	Resolution
Greek Orthodox Church - New Sanctuary	9437.001	ERP STANDARD GENERAL	SEMI-PUBLIC - CHURCHES	APPROVED	4275+00	Permit is located outside of basins that are predicted to be impacted by the project. However, Pond 2-5 Alt B is located immediately north-west.	Permit is located in a self-contained closed basin that will not be impacted by construction of pond. If Pond 2-5 Alt B is constructed, roadside ditches and pipe/drainage systems will be suitably sized so that excess runoff is not discharged into permit area.
Superior Residences at Citrus Coutny	33495.000	ERP STANDARD GENERAL	RESIDENTIAL - CONGREGATE LIVING FACILITY	APPROVED	4275+00	Project ROW is located upstream of permit. Therefore, the project may alter the amount of runoff being discharged towards the permit.	Only a small part of the Suncoast Trail ROW intersects the upstream reaches of one basin to which the permit contributes runoff. However, runoff from this section of the existing basin does not currently drain through the permit site. Therefore, construction of the project will not alter the quantity or quality of runoff draining to the permit.
Bachschmidt Sand Pit	43722.000	ERP STANDARD GENERAL	MINING - LANDFILL	APPROVED	4320+00	ROW extends across western part of permit site. The project may remove some floodplain storage and alter the quantity of runoff currently draining towards the permit.	It is likely that site will be acquired as part of the project. However, if part of site is retained, runoff falling within ROW will be conveyed to a stormwater pond. Therefore, there will be a reduction in the quantity of runoff being discharged to permit and compensatory storage will be provided resulting in no adverse impacts.
Dab San Mine	651374.000	EXEMPTION APPLICATION	MINING - DIRT	DENIED	4320+00	ROW extends across western part of permit site. The project may remove some floodplain storage and alter the quantity of runoff currently draining towards the permit.	It is likely that site will be acquired as part of the project. However, if part of site is retained, runoff falling within ROW will be conveyed to a stormwater pond. Therefore, there will be a reduction in the quantity of runoff being discharged to permit and compensatory storage will be provided resulting in no adverse impacts.
Allen Plantation PH 1 Final PH 2 Grading	31776.000	ERP INDIVIDUAL	RESIDENTIAL - SINGLE FAMILY; EXPIRED PERMITS (CONSTRUCTION NEVER INITIATED)	DELETED	4325+00	Project ROW is located upstream of permit. Therefore, the project may alter the amount of runoff being discharged towards the permit.	ROW runoff will be captured and treated in stormwater ponds ensuring that the quantity and quality of runoff being discharged to permit is not adversely impacted. Upstream off-site currently drains to the permit along W Sanction Road ditches. The existing ditches will be upgraded as part of the project ensuring that conveyance of upstream drainage areas to the permit is maintained.
L & S Investment - Lecanto Site	30691.000	ERP STANDARD GENERAL	RESIDENTIAL - DRAINAGE SYSTEMS; EXPIRED PERMITS (CONSTRUCTION NEVER INITIATED)	DELETED	4365+00	Project ROW is located upstream of permit. Therefore, the project may alter the amount of runoff being discharged towards the permit.	Upstream off-site runoff as well as ROW runoff will be captured and treated in stormwater ponds ensuring that the quantity and quality of runoff being discharged to permit is not adversely impacted.
Key Trainaing Center - Davis Cottage & Pole	4158.001	MSSW GENERAL PERMIT	GOVERNMENT - COUNTY, STATE, CITY	APPROVED	4370+00	Project ROW is located upstream of permit. Therefore, the project may alter the amount of runoff being discharged towards the permit	Runoff draining from the existing ROW area does not currently contribute any runoff to permit. Therefore, the project will not alter the quality or quantity of runoff being currently being conveyed to the permit.
Key Training Center - WYKE TV Tower	4158.003	MSSW GENERAL PERMIT	COMMERICAL - BUILDING	APPROVED	4372+00	Project ROW is located upstream of permit. Therefore, the project may alter the amount of runoff being discharged towards the permit.	Runoff draining from the existing ROW area does not currently contribute any runoff to permit. Therefore, the project will not alter the quality or quantity of runoff being currently being conveyed to the permit.
Key Center - Educational/Training Complex	27100.000	ERP STANDARD GENERAL	COMMERICAL - CONGREGATE LIVING FACILITY	APPROVED	4372+00	Permit is located outside of basins that are predicted to be impacted by project.	None required
Damron Auto Sales & Service-Parking	6245.002	ERP STANDARD GENERAL	COMMERICAL - BUSINESS	APPROVED	4375+00	Permit is located outside of basins that are predicted to be impacted by project.	None required

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Damron Auto Parts	6245.003	ERP STANDARD GENERAL	COMMERICAL - BUSINESS	APPROVED	4370+00	Permit is located outside of basins that are predicted to be impacted by project.	None required
Citrus Co. High Ridge Estates Road Impr.	6362.000	MSSW GENERAL PERMIT	ROAD PROJECTS - COUNTY, STATE, CITY; EXPIRED PERMITS (CONSTRUCTION NEVER INITIATED)	DELETED	4380+00	Project ROW is located upstream of permit. Therefore, the project may alter the amount and quality of runoff being discharged towards the permit.	ROW runoff will be conveyed to stormwater ponds. Therefore, the project will not adversely impact the quantity or quality of runoff being discharged to the permit area.
Keepit Safe Storage & Moving Center	11575.000	MSSW GENERAL PERMIT	COMMERICAL - BUSINESS	APPROVED	4380+00	Permit is located outside of basins that are predicted to be impacted by project.	None required
Shuklas's Prof. Office Complex	7378.000	MSSW NOTICED GENERAL	COMMERICAL - CONVERSION OF PERMITS, PROJECT CODE	APPROVED	4405+00	Permit is generally in a self-contained closed basin. However, the project ROW and proposed road extends across the northern corner of the permit. Therefore, any increase in runoff from th e project ROW may result in excess stormwater being discharged into the permit site.	ROW runoff will be captured and conveyed to stormwater ponds for treatment and retention ensuring a reduction in water quality and increases in stormwater discharges to the permit site do not occur. Off-site runoff currently drains towards the ROW and permit along roadside ditches for CR 486. The roadside ditches will be retained and upgraded as part of the project
Bible Baptist Church of Crystal River, Inc.	14156.001	ERP STANDARD GENERAL	SEMI-PUBLIC - CHURCHES	APPROVED	4410+00	The project ROW is located upstream of permit. Therefore, any increase in runoff from the project ROW may result in excess stormwater being discharged into the permit site.	ROW runoff will be captured and conveyed to stormwater ponds for treatment and retention ensuring a reduction in water quality and increases in stormwater discharges to the permit site do not occur. Off-site runoff currently drains towards the ROW and permit area along roadside ditches for CR 486. The roadside ditches will be retained and upgraded as part of the project.
A-1 Mini Storage	28681.001	ERP STANDARD GENERAL	COMMERICAL - BUSINESS	APPROVED	4415+00	The project ROW is located upstream of permit. Therefore, any increase in runoff from the project ROW may result in excess stormwater being discharged into the permit site.	ROW runoff will be captured and conveyed to stormwater ponds for treatment and retention ensuring a reduction in water quality and increases in stormwater discharges to the permit site do not occur. Off-site runoff currently drains towards the ROW and permit area along roadside ditches for CR 486. The roadside ditches will be retained and upgraded as part of the project.
Citrus County - CR 486 Phase 4 Improvements - SR 44 to Service Rd	40511.000	ERP STANDARD GENERAL	ROAD PROJECTS - COUNTY, STATE, CITY	APPROVED	4355+00	Permit is located outside of basins that are predicted to be impacted by project.	None required

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APPENDIX G

Pond Site Natural Environmental Evaluation

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SUNCOAST PARKWAY 2 FROM
STATE ROAD 44 TO COUNTY ROAD 486
FPID 442764-1
POND SITE NATURAL ENVIRONMENTAL EVALUATION

This document provides an environmental evaluation of the twelve (12) pond site alternatives considered in association with the proposed construction of the Suncoast Parkway 2 (SR 598) from State Road (SR) 44 to County Road (CR) 486, a new two-mile limited-access toll road facility. Multiple stormwater pond locations are being considered for this project in efforts to select locations that would avoid or minimize natural resource impacts to the greatest extent possible, as permitting regulations require. The results of the environmental evaluation are based on a combination of aerial interpretation, desktop review of on-site natural resources, and a field evaluation that was conducted on October 10, 2019, January 14, 2020 and May 15, 2020.

Methodology

Prior to the field investigation, a desktop literature search was performed to identify the soils, land use, potential wetland areas, and protected species that may occur within and adjacent to the pond site alternatives. The following resources were used for the desktop review:

- ESRI World Imagery (2019);
- U.S. Department of Agriculture (USDA), Soil Conservation Service Soil Survey of Citrus County, Florida (1988);
- Natural Resources Conservation Service (NRCS) Digital SSRUGO Soils Database (2019);
- Southwest Florida Water Management District's (SWFWMD) Land Use/Land Cover Data (2017);
- U.S. Fish and Wildlife Service (USFWS), "Classification of Wetlands and Deepwater Habitats of the United States." (Cowardin, *et.al.*, 1979);
- Final Regional Supplement to the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (2010);
- Florida's Endangered and Threatened Species List (Florida Fish and Wildlife Conservation Commission [FWC], 2018);
- Endangered & Threatened Wildlife and Plants. 50 CFR 17.11 and 17.12. (USFWS, 2019); and
- List of Florida's Endangered Plant Species (5B-40 FAC) (FDACS, 2019).

In an effort to select pond site locations that would avoid or minimize environmental impacts to the greatest extent possible, the Suncoast Parkway 2 pond site alternatives were evaluated for the presence of wetlands and the potential occurrence of protected wildlife species. A field evaluation was conducted by qualified ecologists on October 10, 2019, January 14, 2020 and May 15, 2020 to evaluate the extent and configuration of wetlands and other surface waters (OSW) and the potential for protected species to occur within and adjacent to the pond site alternatives.

Wetlands and OSW were defined in accordance with federal and state guidelines (2010 USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region and FAC Rule 62-340, respectively).

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Based on a review of the USFWS and FWC databases, six (6) protected species have the potential to occur in within or adjacent to the potential pond sites:

- Florida scrub-jay (*Aphelocoma coerulescens*);
- Red-cockaded woodpecker (*Picoides borealis*);
- Eastern indigo snake (*Drymarchon couperi*);
- Wood stork (*Mycteria americana*);
- Southeastern American kestrel (*Falco sparverius paulus*); and
- Gopher tortoise (*Gopherus polyphemus*).

Florida's Turnpike Enterprise (FTE) has coordinated with the USFWS regarding the potential for protected species that may occur within the Suncoast Parkway 2 project area, a copy of the Meeting Notes is included as Attachment 1.

The pond sites alternatives occur within the USFWS Consultation Area for the Florida scrub-jay. Species-specific scrub-jay surveys were conducted in spring 2020 in accordance with approved USFWS survey methods. Survey results indicate that scrub-jays are no longer present within any of the proposed pond sites and there are no documented occurrences reported within adjacent potential habitat. These findings have been confirmed through coordination with the FWC and USFWS. Therefore, pond site alternatives will have no effect on scrub-jays.

Although the pond sites alternatives occur within the USFWS Consultation Area for the red-cockaded woodpecker, the USFWS provided concurrence that the Suncoast Parkway 2 project area does not contain suitable habitat for the red-cockaded woodpecker. Therefore, pond site alternatives will have no effect on red-cockaded woodpeckers.

USFWS records indicate an eastern indigo snake was observed within 1 mile of the project area in the 1990's. Because of its cryptic nature, species-specific surveys for eastern indigo snake are not proposed and it is assumed all pond site alternatives contain suitable habitat. Unavoidable impacts to eastern indigo snake habitat in selected pond sites will be permitted through section 10 consultation with the USFWS. The project will utilize the USFWS's *Standard Protection Measures for the Eastern Indigo Snake* during site preparation and project construction.

The proposed project area is not located within a wood stork core foraging area; however, the pond sites alternatives were evaluated for the presence of wetlands and surface waters that have potential to provide suitable foraging or nesting habitat for the wood stork. No suitable habitat was observed; therefore, the pond site alternatives will have no effect on wood storks.

The southeastern American kestrel (kestrel) is documented to occur within the vicinity of the Suncoast Parkway 2 project area. During the field evaluation, the pond sites alternatives were evaluated for suitable kestrel habitat. A species-specific survey for the southeastern American kestrel was also conducted within the proposed pond sites May-July 2020, in accordance with FWC-approved methodology. During the species-specific survey, kestrels were observed foraging within the northern portion of the project area (pond site alternatives 2-7, Alt 3 and DRA 1A). No nest sites were observed.

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Gopher tortoises (*Gopherus polyphemus*) are documented to occur within and adjacent to the Suncoast Parkway 2 project area. All pond sites alternatives contain suitable gopher tortoise habitat and were evaluated for the presence of gopher tortoise burrows. Once the preferred pond site locations are finalized, a 100% gopher tortoise survey will be conducted, and all impacted gopher tortoises will be relocated to a long-term gopher tortoise recipient site prior to construction in accordance with FWC Gopher Tortoise Permitting Guidelines (April 2008 – Revised January 2017).

Pond Sites in Basin 2-5

Five (5) pond sites were evaluated in Basin 2-5. The locations of these pond site alternatives are displayed on Figure 1-1 at the conclusion of this section.

Pond Site 2-5, Alt 1

Pond Site 2-5, Alt 1 is found at the southern terminus of the proposed Suncoast Parkway 2 alignment, located northwest of the SR 44 and West Shady Knoll Place intersection. The site contains a mixture of coniferous-hardwood forest, residential, and roadways. The dominant vegetation within the pond site is slash pine (*Pinus elliottii*), live oak (*Quercus virginiana*), saltbush (*Baccharis halimifolia*), American beautyberry (*Callicarpa americana*), winged sumac (*Rhus copallinum*), and maintained pasture grasses.

No wetlands or OSW are located within the pond site.

During the field evaluation, a gopher tortoise and a kestrel nest box were observed foraging on the berm surrounding the adjacent dry treatment stormwater facility. No other protected species, or evidence thereof, were observed. The construction of this pond site may impact the southeastern American kestrel.

Pond Site 2-5, Alt 2

Pond Site 2-5, Alt 2 is located north of SR 44, adjacent to a powerline easement and northwest of Pond Site 2-5, Alt 3. This site consists of a hardwood forest within an active cattle pasture. The pond site is vegetated by slash pine, live oak, laurel oak (*Quercus laurifolia*), cabbage palm (*Sabal palmetto*), and bahiagrass (*Paspalum notatum*).

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No wetlands or OSWs are located within or adjacent to the pond site.

A gopher tortoise was observed foraging within this pond site alternative. Although no evidence of kestrel activity was observed during the site evaluation, Pond Site 2-5, Alt 2 contains open pasture with snags capable of supporting the southeastern American kestrel. No other protected species, or evidence thereof, were observed. The construction of this pond site may impact the southeastern American kestrel.

Pond Site 2-5, Alt 3

Pond Site 2-5, Alt 3 is located northeast of SR 44, adjacent to a powerline easement and southeast of Pond Site 2-5, Alt 2. The site is a fenced, active pasture which is dominated by bahiagrass, beggartick (*Bidens alba*), dog fennel (*Eupatorium capillifolium*), and other pasture grasses.

No wetlands or OSWs are located within or adjacent to the pond site.

No protected species, or evidence thereof, were observed within Pond Site 2-5, Alt 3; however, potentially occupied gopher tortoise burrows were observed adjacent to this pond site.

Pond Site 2-5, Alt 4

Pond Site 2-5, Alt 4 is located east of the SR 44 and West Shady Knoll Place intersection. This pond site contains forested habitat and a dry stormwater treatment facility. The forested habitat is vegetated by live oak, slash pine, and American beautyberry. The vegetation observed within the stormwater pond includes slash pine saplings, cabbage palm, salt bush, goldenrod (*Solidago sempervirens*), and various beaksedges (*Rhynchospora* spp.).

No wetlands or OSWs are located within or adjacent to the pond site. One dry stormwater treatment facility is located within this pond site alternative.

A gopher tortoise was observed foraging within the pond site and a kestrel nest box was observed on the fence surrounding the adjacent stormwater facility. No other protected species,

or evidence thereof, were observed within Pond Site 2-5, Alt 4. The construction of this pond site may impact the southeastern American kestrel.

Pond Site DRA-E

Pond Site DRA-E is located east of the Pond Site 2-5, Alt 4. This mostly forested pond site is dominated by live oak, slash pine, cabbage palm and American beautyberry. The groundcover within scattered herbaceous openings is predominately winged sumac, beggartick, and dog fennel.

No wetlands are located within or adjacent to the pond site.

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DRMP, Inc.
941 Lake Baldwin Ln.
Orlando, FL 32814
www.drmp.com
Phone: 407-896-0594
Fax: 407-896-4836

DATE:	DRAWN BY:	PROJECT NUMBER:
September 2020	Shappell	18-0145.000

Suncoast Parkway 2 - SR 44 to CR 486

FDOT Florida's Turnpike Enterprise
FPID No. 442764-1
Citrus County, Florida

Pond Site Alternatives Map

DATA SOURCE:
Aerial - ESRI 2019

Figure 1-1

Pond Sites in Basin 2-6

Three (3) pond sites were evaluated in Basin 2-6. The locations of these pond site alternatives are displayed on Figure 1-2 at the conclusion of this section.

Pond Site 2-6, Alt 1

Pond Site 2-6, Alt 1 is located north of West Sanction Road and west of North Maylen Avenue. The pond site is immediately adjacent to an inactive quarry where extensive excavation has taken place. Most of this site has been disturbed and the tree canopy is largely absent. Groundcover vegetation is dominated by common ragweed (*Ambrosia artemisiifolia*), bahiagrass, camphorweed (*Heterotheca subaxillaris*), and dog fennel.

There are no wetlands or OSWs in the proximity of the pond site.

Gopher tortoise burrows and a foraging tortoise were observed within Pond Site 2-6, Alt 1. No other protected species, or evidence thereof, were observed.

Pond Site 2-6, Alt 2

Pond Site 2-6, Alt 2 is located west of N Jali Point and consists of improved pasture and forested habitats. The improved pasture habitat is dominated by a scattered live oak canopy, bahiagrass, camphorweed, dog fennel and beggartick. The forested habitat is vegetated by mixed slash pine, live oak, and laurel oak canopy, with turkey oak (*Quercus laevis*), saw palmetto (*Serenoa repens*), bracken fern (*Pteridium aquilinum*), sand cordgrass (*Spartina bakeri*), and reindeer moss (*Cladonia rangiferina*).

No wetlands or OSWs are located within or adjacent to the pond site.

An abandoned gopher tortoise burrow was observed within Pond Site 2-6, Alt 2. No other protected species, or evidence thereof, were observed.

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Pond Site 2-6, Alt 3

Pond Site 2-6, Alt 3 is located west of N Jali Point. The mostly forested site is vegetated by mixed slash pine, live oak, and laurel oak canopy, with turkey oak, saw palmetto (*Serenoa repens*), bracken fern (*Pteridium aquilinum*), sand cordgrass (*Spartina bakeri*), and reindeer moss (*Cladonia rangiferina*).

No wetlands or OSWs are located within or adjacent to the pond site.

No protected species, or evidence thereof, were observed.

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Phone: 407-896-0594
Fax: 407-896-4836

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FDOT Florida's Turnpike Enterprise

FPID No. 442764-1

Citrus County, Florida

Pond Site Alternatives Map

DATA SOURCE:
Aerial - ESRI 2019

Figure 1-2

Pond Sites in Basin 2-7

Four (4) pond sites were evaluated in Basin 2-7. The locations of these pond site alternatives are displayed on Figure 1-3 at the conclusion of this section.

Pond Site 2-7, Alt 1

Pond Site 2-7, Alt 1 is located north of the West Ziggy Street and east of North Knoll Road. This pond site is dominated by a xeric oak forest. The habitat is dominated by longleaf pine (*Pinus palustris*), sand pine (*Pinus clausa*), sand live oak (*Quercus geminata*), live oak, turkey oak, rosemary shrub (*Ceratiola ericoides*), red cedar (*Juniperus virginiana*), saw palmetto, and sand cordgrass, natal grass (*Melinis repens*), reindeer moss, and dog fennel.

No wetlands or OSWs are located within or adjacent to the pond site.

No protected species, or evidence thereof, were observed.

Pond Site 2-7, Alt 2

Pond Site 2-7, Alt 2 is located south of CR 486 and east of North Knoll Road. This pond site is dominated by coniferous-hardwood forest. The habitat is dominated by sand pine, turkey oak, sand live oak, longleaf pine, rosemary shrub, red cedar, saw palmetto, and sand cordgrass, natal grass, and reindeer moss.

No wetlands or OSWs are located within or adjacent to the pond site.

No protected species, or evidence thereof, were observed.

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Pond Site 2-7, Alt 3

Pond Site 2-7, Alt 3 is located south of CR 486 and intersects North Quarterback Terrace. The pond site is within the Citrus Sand & Debris Closed Landfill where extensive excavation has taken place. Most of this site has been disturbed and the tree canopy is absent. Groundcover vegetation is dominated by broom sedge, Bermuda grass (*Cynodon dactylon*), dog fennel, common ragweed, camphorweed, and cogon grass (*Imperata cylindrica*).

No wetlands or OSWs are located within or adjacent to the pond site.

No protected species, or evidence thereof, were observed during the pond site evaluation; however, southeastern American kestrels were observed foraging within the pond site during the 2020 species-specific survey. No nest sites were observed. The construction of this pond site may impact the southeastern American kestrel.

Pond Site DRA 1A

Pond Site DRA 1A is located south of CR 486 and west of Knoll Rd, within the Citrus Sand & Debris Closed Landfill and adjacent to an existing, permitted stormwater treatment pond. This site has been disturbed and the tree canopy is largely absent. This pond site alternative is dominated Chapman's goldenrod (*Solidago odora chapmanii*), sand blackberry (*Rubus cuneifolius*), winged sumac, ragweed, eastern baccharis (*Baccharis halimifolia*), and mimosa tree (*Albizia julibrissin*).

No wetlands or OSWs are located within or adjacent to the pond site.

No protected species, or evidence thereof, were observed during the pond site evaluation; however, southeastern American kestrels were observed foraging within the pond site during the 2020 species-specific survey. No nest sites were observed. The construction of this pond site may impact the southeastern American kestrel.

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DRMP, Inc.
941 Lake Baldwin Ln.
Orlando, FL 32814
www.drmp.com
Phone: 407-896-0594
Fax: 407-896-4836

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Suncoast Parkway 2 - SR 44 to CR 486

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Pond Site Alternatives Map

DATA SOURCE:
Aerial - ESRI 2019

Figure 1-3

Summary

The pond site alternatives selected for proposed construction of the Suncoast Parkway 2 from SR 44 to CR 486 were evaluated for presence of wetlands and protected wildlife species. None of the pond site alternatives contain wetlands or OSWs. One stormwater treatment facility is located within Pond Site 2-5, Alt 4. Since the stormwater treatment facility is dry, it does not provide suitable wood stork foraging habitat.

All pond sites contain suitable habitat for eastern indigo snake and gopher tortoises. Unavoidable impacts to these species will be permitted through coordination with USFWS and FWC. Pond site alternatives were ranked for potential to impact listed species or habitat. Three pond sites within Basin 2-5 (Alt 1, Alt 2, and Alt 4) may occur within habitat protection areas of nesting southeastern American kestrels due to their proximity to potential nest sites. Kestrels were observed during the 2020 species-specific survey in Basin 2-7 within pond sites Alt 3 and DRA 1A. Therefore, the listed species impact potential for these pond site alternatives was ranked "moderate." The remaining alternatives were ranked "low" for listed species impact potential based on field reviews. Besides gopher tortoises, no protected species, or evidence thereof, were observed in these sites. A summary of the findings is provided in Table 1.

Table 1 - Suncoast Parkway 2 From SR 44 to CR 486 Pond Site Alternatives

Pond Site	Potential Wetland Impacts	Listed Species and Habitat Impact Potential†
2-5, Alt 1	No	Moderate
2-5, Alt 2	No	Moderate
2-5, Alt 3	No	Low
2-5, Alt 4	No	Moderate
DRA-E	No	Low
2-6, Alt 1	No	Low
2-6, Alt 2	No	Low
2-6, Alt 3	No	Low
2-7, Alt 1	No	Low
2-7, Alt 2	No	Low
2-7, Alt 3	No	Moderate
DRA 1A	No	Moderate

†Impacts may be avoided during design phase.

The following permits will be required for the Suncoast Parkway 2 project, including the above-mentioned pond site alternatives.

- Environmental Resource Permit – St. Johns River Water Management District
- National Pollutant Discharge Elimination System Permit – Florida Department of Environmental Protection
- Incidental Take Permit and Habitation Conservation Plan – USFWS
- Gopher Tortoise Relocation Permit – FWC

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Attachment 1:

2019 Florida's Turnpike Enterprise and United States Fish and Wildlife Service Meeting Notes

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Florida Department of Transportation

RON DESANTIS
GOVERNOR

Florida's Turnpike Enterprise
P.O. Box 613069, Ocoee, FL 34761
407-532-3999

KEVIN J. THIBAULT, P.E.
SECRETARY

Meeting Notes

FLORIDA DEPARTMENT OF TRANSPORTATION – FLORIDA'S TURNPIKE ENTERPRISE
UNITED STATES FISH AND WILDLIFE SERVICE
SUNCOAST PARKWAY 2 – FROM S.R. 44 TO C.R. 486 (FPID #442764-1)
CITRUS COUNTY
DECEMBER 11, 2019, 11:00 AM – CONFERENCE CALL

Attendees:

Zakia Williams	USFWS (via GoTo Meeting)
Annemarie Hammond	FTE/EMO (via GoTo Meeting)
Tiffany Crosby	FTE/Atkins, EMO (via GoTo Meeting)
Scott Stewart	WBQ/Roadway and Drainage (via GoTo Meeting)
Chuck Smith	DRMP / Env (via GoTo Meeting)

These notes are not intended to be verbatim, but rather a general synopsis of the discussion during the meeting.

I. Introductions

FTE began the meeting with introductions off all attendees. The goal of the conference call was to determine the protected species surveys, permitting, and mitigation requirements with the United States Fish and Wildlife Service (USFWS) for the proposed Suncoast Parkway 2 from SR 44 to CR 486 (proposed project).

II. Project Description/Background

- FTE provided an overview of the project history for Suncoast Parkway 2. FTE is proposing the construction of a two-mile new alignment of the Suncoast Parkway 2 from SR 44 to CR 486, (Land Use Map: Figure 1).
- FTE stated that the Stated Environmental Impacts Report (SEIR) was signed in February 1998 (Suncoast Parkway 2 from US 98 in Hernando County to US 19/98 in Citrus County, FPID # 405270-1), and reevaluations were approved in August 2010 and February 2017. The current proposed portion will also be reevaluated.
- FTE stated that there are no United States Army Corps of Engineers (USACE) jurisdictional wetlands within the proposed project area. Therefore, no USACE is permit anticipated. Two small, isolated surface waters are located in the project area and both were reviewed previously by USACE and determined non-jurisdictional. There are no state-owned lands or historical/archeological sites within the proposed project area.

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- FTE confirmed that the current Suncoast Parkway 2 project under construction was permitted via Section 10 consultation with an existing ITP for Eastern Indigo Snakes and Gopher Tortoises. An HCP was provided to support the ITP.
- Since there is no federal nexus anticipated with the USACE, FTE is proposing Section 10 Consultation with USFWS. Due to the permitting complexity of the south segment of Suncoast Parkway 2 under construction, FTE requested that a new Incidental Take Permit (ITP) and Habitation Conservation Plan (HCP) be developed for the proposed project.
    - Ms. Zakia Williams (USFWS) indicated that she will be the lead permit reviewer and Ms. Erin Gawera (USFWS) will assist her with the HCP review. Ms. Williams agreed that a new permit and HCP is preferred and to proceed with developing a new ITP/HCP for this project, but she will confirm if it would be acceptable in accordance with the USFWS regulations.

III. Federally protected species with the potential to occur within the proposed project area.

- **Florida scrub-jay (*Aphelocoma coerulescens*)**
    - FTE provided a history of scrub jay observations for the Suncoast Parkway 2 corridor in which the USFWS identified seven Florida scrub-jay groups in 1992. Subsequent corridor surveys were conducted for the SEIR in 1998 and four Florida scrub-jay groups were documented. Additional surveys for the corridor were conducted in 2009 and no Florida scrub-jay were observed. Surveys were completed within the Suncoast Parkway 2 alignment from South of SR 700 (US 98) to SR 44 project area in 2015 and no scrub jays were documented.
        - USFWS confirmed that their records show no current scrub jay observations within the project area.
    - FTE indicated that there was an existing commitment to the USFWS to survey all Type I Florida scrub jay habitat within the project area and all-natural habitat within ¼ mile of the Type I habitat.
        - USFWS acknowledged this commitment.
    - In order to meet the Florida scrub-jay commitment, FTE will conduct a Florida scrub-jay survey on all Type I habitat within the project footprint and all natural areas within ¼ mile of the Type I habitat proposed in Figure 2.
        - USFWS indicated they would review Figure 2 to confirm the proposed survey areas meet the commitment.
    - Based on the results of previous surveys results, it is anticipated that no impacts to Florida scrub-jays will occur.
        - USFWS agreed with this assessment.

- **Eastern indigo snake (EIS) (*Drymarchon couperi*)**
    - FTE is proposing no species-specific surveys for EIS and it is anticipated that the proposed project will receive a ***May Affect*** (A>B>C>D) determination

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based on the Eastern Indigo Snake Programmatic Key (2013). FTE is assuming presence of EIS habitat within the proposed project area.

    - FTE is proposing the avoid and minimize impacts to EIS by utilizing the Standard Protection Measures the Eastern Indigo Snake (August 2013)
    - FTE will obtain a Florida Fish and Wildlife Conservation Commission (FWC) gopher tortoise relocation permit as necessary and will follow the Interim Policy on the Relocation of Priority Commensal found in the Florida Fish and Wildlife Conservation Commission (FWC) Gopher Tortoise Permitting Guidelines (2017).
    - The HCP for the southern segment of Suncoast Parkway 2 had a commitment for the transfer of EIS eggs to the Orianne Society. FTE is proposing to maintain this commitment for this segment.
    - USFWS stated that the Eastern Indigo Snake Programmatic Key (2013) will be followed for the proposed project. USFWS also agreed to continuing the condition that EIS eggs discovered during the gopher tortoise relocation should be taken to the Orianne Society.
    - USFWS indicated that their records indicate an EIS was observed within 1 mile of the project area in the 1990's.
  - Mitigation Options
    - FTE is proposing the quantification of impacts to EIS habitat by using male and female home ranges within the proposed project ROW to determine mitigation for EIS.
      - USFWS agreed with this approach.
    - FTE proposed that observational data for EIS will be reported to USFWS, and proposed obtaining credits from Platt Branch Mitigation Bank to offset impacts to EIS habitat.
      - USFWS agreed with the reporting and the use of Platt Branch credits to offset EIS habitat impacts.

- **Red-cockaded woodpecker (RCW) (*Picoides borealis*)**
  - FTE proposed that no suitable habitat for RCW is located within project area. Therefore, no surveys for RCWs are proposed within the project area. It is anticipated that the proposed project will receive a ***No Affect*** determination.
    - USFWS agreed that no habitat for RCW is located within the project area and no surveys are required.
- **Wood stork (*Mycteria Americana*)**
  - FTE stated there are no wetlands within the project area that provide suitable foraging or nesting habitat. It is anticipated that the proposed project will receive a ***No Affect*** determination.
    - USFWS agreed that no habitat for wood stork is located within the project area.
- **Gopher tortoise (*Gopherus polyphemus*) (Candidate)**

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- FTE indicated that gopher tortoises will be included in the ITP and HCP. All gopher tortoises will be relocated prior constructions in accordance with FWC Gopher Tortoise Permitting Guidelines.
    - USFWS agreed that the gopher tortoise will be included in the ITP and HCP.

IV. Action Items

- USFWS to confirm if a new ITP and HCP will be developed for the proposed project. USFWS anticipates a 6-8 month review time for the proposed project but recommended to allow for eleven (11) months.
- USFWS will confirm that the Florida scrub-jay survey area presented in Figure 2 is sufficient to determined presence and/or absence of the Florida scrub-jay within the project area.
- FTE will provide a tentative permit submittal schedule to USFWS and confirm the Florida scrub-jay survey scheduled for March 2020.

Attachments **Figure 1 Land Use**
Figure 2 Scrub-Jay Type I Habitat Map

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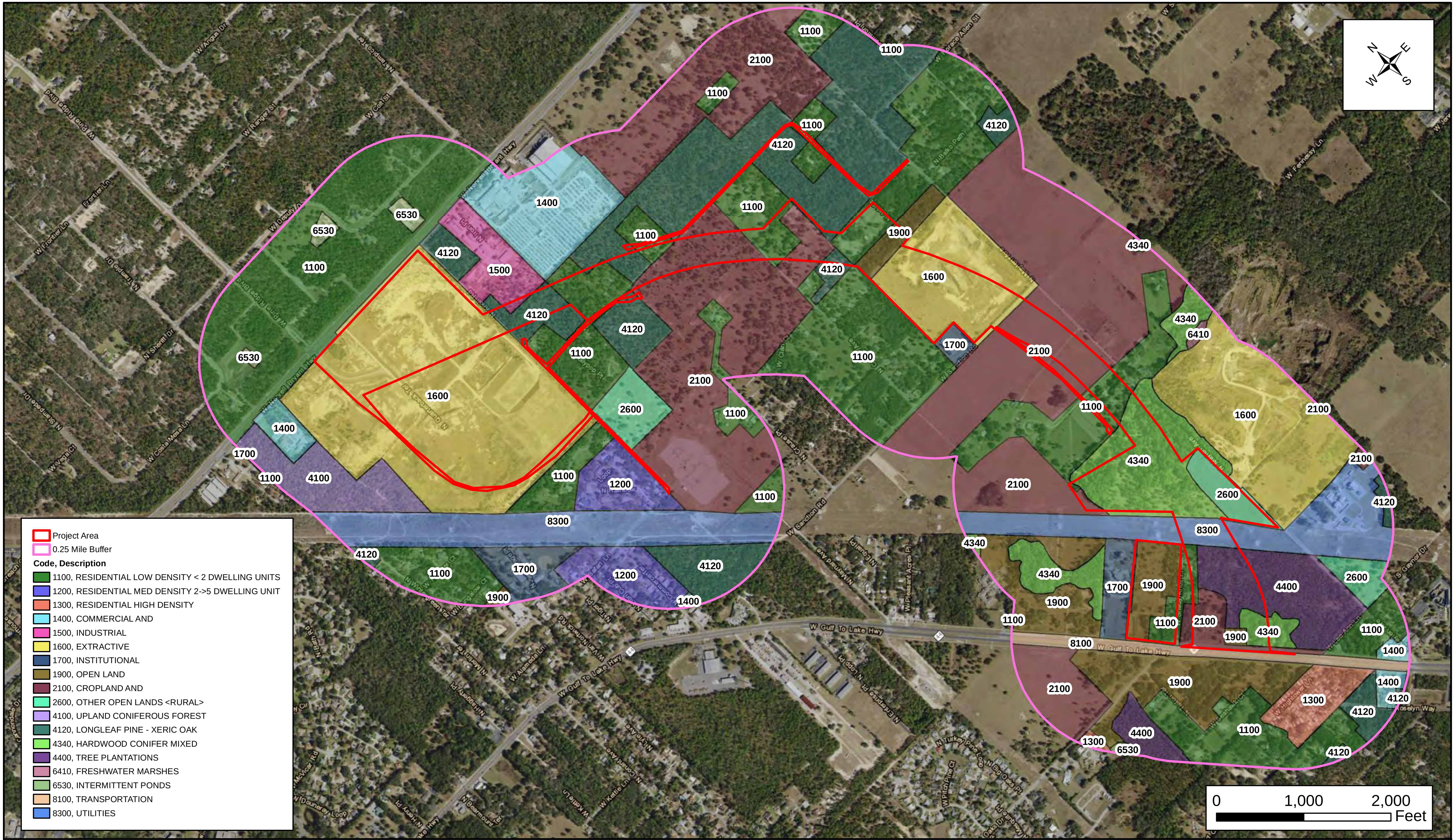

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DRMP, Inc.
941 Lake Baldwin Ln.
Orlando, FL 32814
www.drmp.com
Phone: 407-896-0594
Fax: 407-896-4836

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Citrus County, Florida

Land Use Map

DATA SOURCE:
Landuse: SWFWMD 2011
Imagery: ESRI 2016

Figure
1

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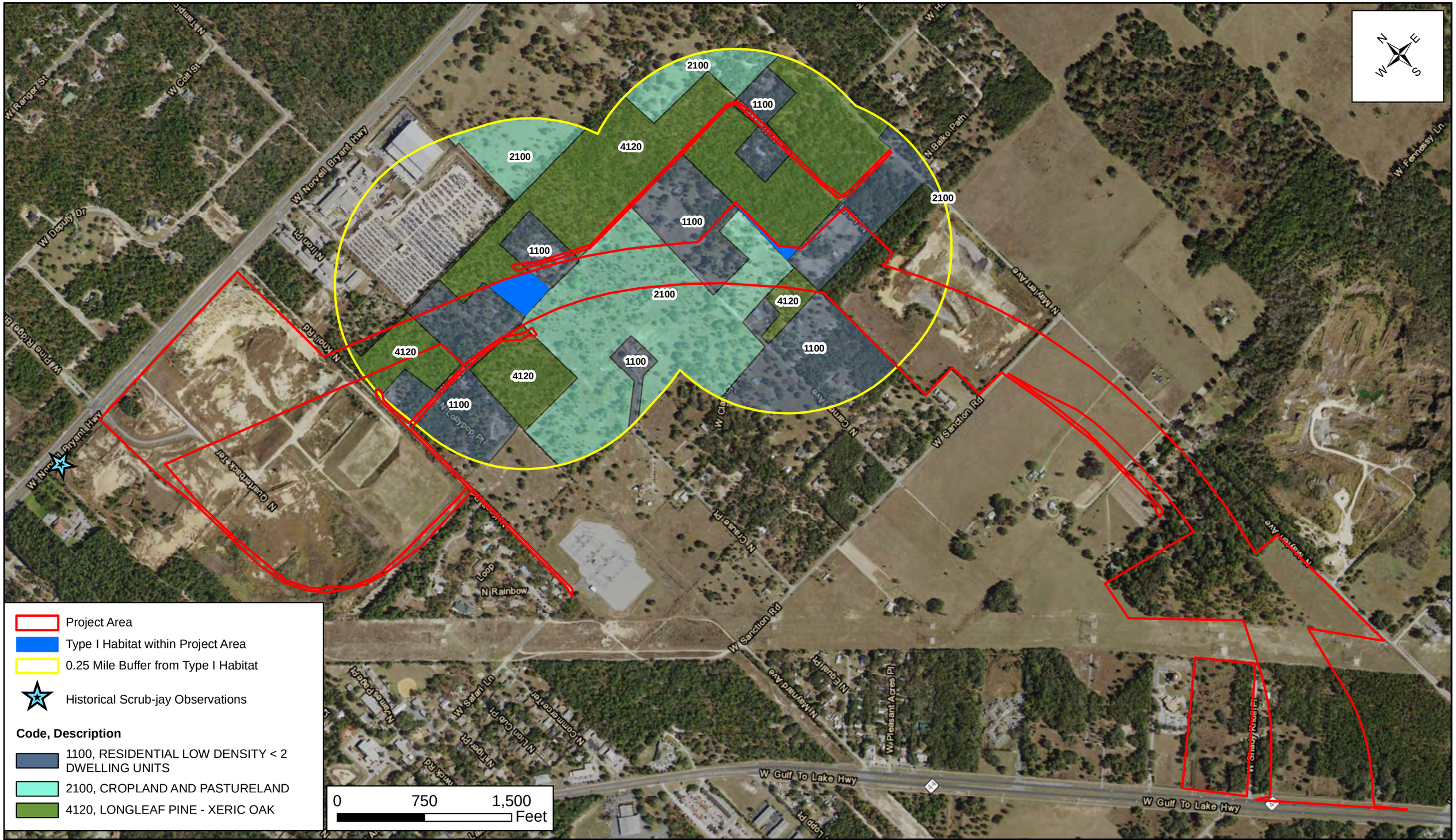

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Orlando, FL 32814
www.drmp.com
Phone: 407-896-0594
Fax: 407-896-4836

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Scrub-Jay Type I Habitat Map

DATA SOURCE:
Landuse: SWFWMD 2011
Imagery: ESRI 2016

Figure
2

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APPENDIX H

Contamination Screening Evaluation

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LEVEL I
CONTAMINATION SCREENING
EVALUATION REPORT (PONDS)

Suncoast Parkway 2

From State Road 44 to County Road 486

Citrus County, Florida

FPID: 442764-1-32-01

September 14, 2020, Rev. 3

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Executive Summary

The purpose of this report is to present the findings of a contamination screening evaluation for eleven proposed pond site alternatives for Suncoast Parkway 2 from south of State Road 44 to County Road 486 in Citrus County. This report identifies and evaluates known or potential contamination sites within or adjacent to the proposed pond sites that may affect implementation of the project. The first ***revision*** of this report was based on Florida Turnpike Enterprise (FTE) comments received on February 14, 2020. The second ***revision*** was based on additional FTE comments received on March 3, 2020 and March 5, 2020. This ***revision*** provided is based on new or modified pond locations provided by the designer on September 9, 2020.

This Level I Contamination Screening Evaluation Report has been prepared using the Florida Department of Transportation Project Development and Environment Manual (Chapter 20) reporting format and standard environmental assessment practices of reviewing records of regulatory agencies, site reconnaissance, literature review, and (when necessary) interviews of individuals and business owners that may provide additional relevant information.

A total of eleven pond site alternatives were evaluated. **Table 1** below presents a summary of the risk ratings assigned to each pond site alternative:

Table 1 – Pond Alternative Risk Rating Summary

Basin	Pond Site	Risk Rating	Notes
2-5	Alt 1	Low	Woods, overgrown field, residences along Shady Knoll Place
	Alt 2	Low	Woods
	Alt 3	Low	Open field, woods
	Alt 4	No	Overgrown field, woods, existing retention pond
2-6	Alt 1	Low	Open soil excavations with soil stockpiles throughout; offsite, adjoining east is an inactive limerock mine
	Alt 2	Low	Woods and one residence
	Alt 3	Low	Open field, woods
2-7	Alt 1	Low	Woods, two empty 55-gallon drums in east central area; no contamination concerns noted
	Alt 2	Low	Woods, overgrown field
	Alt 3	Low	Inactive open pit sand mine
-	DRA-E	Low	Woods and one residence

Based on the conclusions of the study and the risk ratings noted above, the following recommendations are made for this project:

- Additional information may become available or site-specific conditions may change from the time this report was prepared and should be considered prior to acquiring right-of-way and/or proceeding with roadway construction.
- For the locations rated No or Low for potential contamination, no further action is required. These pond locations have been evaluated and determined not to have any contamination risk to the study area at this time.
- Once final design plans are available, additional review is recommended in consideration of dewatering operations that may be necessary under the National Pollutant Discharge Elimination System Generic Permit for Stormwater Discharges from Large and Small Construction Activities. Verification testing may be warranted for contamination issues within 500 feet of the dewatering area.

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Appendices

CSER Appendix A: Project Location and Pond Alternative Location Maps

CSER Appendix B: Historical Aerial Photographs

CSER Appendix C: USGS Topographic Map

CSER Appendix D: Environmental Database Report

CSER Appendix E: Site Photographs

CSER Appendix F: Supplemental Information

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1.0 Introduction

The purpose of this report is to present the findings of a contamination screening evaluation for eleven proposed pond site alternatives for the Suncoast Parkway 2 roadway improvements from south of State Road (SR) 44 to County Road (CR) 486 in Citrus County. This report identifies and evaluates known or potential contamination sites within or adjacent to the proposed pond sites that may affect implementation of the project. Recommendations are provided in **Section 9**.

2.0 Project Description

The Suncoast Parkway 2 project is a four-lane, divided, limited access, toll highway. The Suncoast Parkway 2 in conjunction with Suncoast Parkway 1 and the Veterans Expressway would form a continuous limited access toll road from the Tampa Bay region into northern Citrus County. The objective of this report is to evaluate the pond site alternatives along a portion of the proposed Suncoast Parkway 2 from SR 44 to CR 486.

3.0 Project Alternatives

Eleven pond site alternatives are under consideration for the Suncoast Parkway 2 project from SR 44 to CR 486. **Table 2** below depicts the pond site alternatives evaluated.

Table 2 – Pond Site Alternatives

Basin	Pond Site
2-5	Alt 1
	Alt 2
	Alt 3
	Alt 4
2-6	Alt 1
	Alt 2
	Alt 3
2-7	Alt 1
	Alt 2
	Alt 3
-	DRA-E

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4.0 Methodology

This Contamination Screening Evaluation Report (CSER) was performed in general accordance with Chapter 20 of the Florida Department of Transportation (FDOT) PD&E Manual. The evaluation included the following tasks:

- Document review using the Citrus County Property Appraiser's website;
- A regulatory review of governmental databases for permits and/or violations associated with contamination issues;
- Obtaining and evaluating historical aerial photographs in an effort to determine potential contamination issues. Copies of select historical aerial photographs are presented in **CSER Appendix B**;
- Review of topographic maps to develop an understanding of previous land uses in the study area and to identify any areas that may show historical, natural and manmade features, which aid in determining potential contamination concerns. A copy of the topographic map is provided in **CSER Appendix C**;
- Conducting site visits to verify information provided and to identify other potential concerns within the vicinity of the project; and
- Determining the contamination potential and assigning a risk rating for each pond site alternative within the proposed project limits.

4.1 Regulatory Review

An environmental database search using Environmental Data Management, Inc. (EDM) was conducted on September 9, 2020 to identify sites, facilities or listings within the study area containing documented or suspected petroleum contamination or other hazardous materials. The EDM report is used as a preliminary screening tool to identify facilities that are registered with various county, state, and federal agencies. This report utilizes the search distances as specified in Part 2, Chapter 20 of the FDOT PD&E Manual. The search distances are as follows:

- 500 feet from the right-of-way (ROW) line for petroleum, drycleaners, and non-petroleum sites,
- 1,000 feet from the ROW line for non-landfill solid waste sites (such as recycling facilities, transfer stations, and debris placement areas), and
- ½ mile from the ROW line for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), National Priorities List (NPL) Superfund sites, or Landfill sites.

The regulatory review of federal and state environmental records utilizes an integrated geographic information system database. The database report provides geocoded and non-geocoded regulatory listings of interest that are identified within the study area. Each listing is located by address, facility identification number and field verified where possible. All are reviewed for the potential of contamination to impact the project. The reviewed records include information compiled by the United States Environmental Protection Agency (EPA), the Florida Department of Environmental Protection (FDEP), and other various reporting programs, as identified in the attached environmental database search report. The facilities identified in the

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EDM report that are evaluated in **Section 8** are as follows: Citrus Sand & Debris Inc., Maylen Avenue Disaster Debris Management Site, Damron Auto Salvage, LKQ, and Crystal River Quarries Inc. – Maylen Mine. A complete list of all regulatory record databases searched is included in the environmental database search report, provided in **CSER Appendix D**.

4.2 Site Reconnaissance

A site visit was conducted on December 4, 2019 and September 9, 2020 to evaluate each property within and in close proximity to the pond sites for potential contamination concerns. The reconnaissance included a systematic inspection of each parcel within each pond site alternative boundaries and surrounding areas looking for signs of potential contamination. This was achieved by walking the parcels within and surrounding the pond site alternatives to gain specific information regarding the usage and condition of each pond site. Photographs of the pond site alternatives and potential contamination concerns were taken during the site inspection. Select images are presented in **CSER Appendix E**.

Some of the typical physical indicators for contamination concerns include: railroad tracks, fill ports and vent pipes associated with underground storage tanks (USTs); oil/petroleum staining; drums; chemical containers; refuse; illicit dumping; solid waste; stressed vegetation; dry cleaning facilities; material handling from adjacent businesses; petroleum dispensers; excavated areas; agricultural use; chemical mix/load areas; stormwater outfall areas; surface water indicators; groundwater monitor wells, restricted area/contamination/hazardous material/petroleum pipeline signage, and other property uses that may present contamination concerns.

A residential shooting range was discovered near Pond 2-6, Alt 3 and empty drums were found onsite at Pond 2-7, Alt 1 during the site reconnaissance. Details about these sites are included in **Section 8.1**. The site reconnaissance in conjunction with the review of historical aerial photography, regulatory database searches, and review/evaluation of available data allows the site to be rated as to the degree of contamination concern as discussed in **Section 4.4**.

4.3 Supplemental Regulatory Information

In addition to the environmental database search report, the regulatory records review was supplemented with readily available information from various online sources as listed below. A copy of useful documentation, if any, is included in **CSER Appendix F**.

- FDEP Map Direct (see map included in **CSER Appendix F**)
- FDEP OCULUS Document Management System
- FDEP Storage Tank/Contaminated Facility search
- FDEP Hazardous Waste Facilities Search
- FDEP Solid Waste Facility Inventory
- EPA EnviroMapper for Envirofacts Multi-system Search
- United States Geological Survey (USGS) Mineral Resource database

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Additionally, Tierra reviewed the PD&E Technical Memorandum (Tech Memo), issued in June 2009. The Tech Memo included the evaluation of an approximate 26-mile corridor from US 98 to US 19 in Citrus and Hernando Counties. The following contamination sites from the 2009 PD&E Tech Memo were evaluated for this project: Crystal River Quarries, Maylen Property, Former Limerock Mine, Damron Auto Salvage/LKQ, and Citrus Sand & Debris. Specific details regarding these contamination sites are discussed in **Section 8.1**.

4.4 Determination of Potential Risk

After gathering and reviewing all readily available public information and conducting site reconnaissance, contamination risk ratings were assigned to sites of potential contamination concern. The rating system is divided into four categories of risk as defined by the FDOT in the PD&E Manual, Part 2, Chapter 20, Section 20.2.2.4, Determination of Risk Rating. These four degrees of risk ratings are "No," "Low," "Medium," and "High." This system expresses the degree of concern for potential contamination problems.

<u>No Risk Site</u>

A review of available information on the property and a review of the conceptual or design plans indicates there is no potential contamination impact to the project. It is possible that contaminants have been handled on the property. However, findings from the Level I evaluation indicate that contamination impacts are not expected.

<u>Low Risk Site</u>

A review of available information indicates that past or current activities on the property have an ongoing contamination issue; the site has a hazardous waste generator identification (ID) number, or the site stores, handles, or manufactures hazardous materials. However, based on the review of conceptual or design plans and/or findings from the Level I evaluation, it is not likely that there would be any contamination impacts to the project.

<u>Medium Risk Site</u>

After a review of conceptual or design plans and findings from a Level I evaluation, a potential contamination impact to the project has been identified. If there is insufficient information (such as regulatory records or site historical documents) to make a determination as to the potential for contamination impact, and there is reasonable suspicion that contamination may exist, the property should be rated at least as a "Medium." Properties used historically as gasoline stations and which have not been evaluated or assessed by regulatory agencies, sites with abandoned in place underground petroleum storage tanks or currently operating gasoline stations should receive this rating.

<u>High Risk Site</u>

After a review of all available information and conceptual or design plans, there is appropriate analytical data that shows contamination will substantially impact construction activities, have implications to ROW acquisition or have other potential transfer of contamination related liability to the FDOT.

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5.0 Land Uses

Land use is an important factor when evaluating historical and current environmental conditions. Evaluating the past use of properties can assist in determining possible chemical constituents that may have been used or associated with a particular parcel. For this project, a site reconnaissance was performed, and the following items were reviewed: historical aerial photographs and topographic maps.

Historical aerial photographs were reviewed to develop a history of the previous land uses within the study area and to identify any areas which may have historical uses that pose potential contamination concerns.

Historical aerial photographs dated 1951, 1960, 1967, 1973, 1985, 1994, 1995, 1998, 2004-2008, 2010, 2011, 2013, 2016, and 2017 were reviewed from the University of Florida, FDOT Survey & Mapping, and Google Earth online libraries. A summary of our review is discussed in **Table 3** below. A copy of the 2017 aerial photograph is presented in **CSER Appendix A**. Copies of select historical aerial photographs are presented in **CSER Appendix B**.

Additional site-specific current land use details regarding facilities/sites of concern are included in **Section 8**.

Table 3: Summary of Aerial Photograph Review

Basin	Pond Site	Historical Use	Contamination Concerns
2-5	Alt 1	Woods, roadway (West Shady Knoll Place), residences	No contamination concerns noted
	Alt 2	Woods, pasture	No contamination concerns noted
	Alt 3	Pasture	No contamination concerns noted
	Alt 4	Pasture, woods	No contamination concerns noted
2-6	Alt 1	Pasture Offsite east: former limerock mine	Offsite east: Limerock mine along east boundary since circa 1985
	Alt 2	Woods, residence	No contamination concerns noted
	Alt 3	Woods, pasture	No contamination concerns noted
2-7	Alt 1	Woods, residence	No contamination concerns noted
	Alt 2	Woods, cleared land, salvage yard adjacent north	Salvage yard along north boundary since circa 1985
	Alt 3	Woods; sand mine since 1985	Sand mine onsite since circa 1985
-	DRA-E	Woods, residence	No contamination concerns noted

5.1 USGS Quadrangle Map

Topographic maps are reviewed to develop an understanding of previous land uses in the study area and to identify any areas that may show historical, natural and manmade features, which aid in determining potential contamination concerns. USGS 7.5-Minute "Crystal River, Florida" Quadrangle dated 1954, photo-revised 1988 and the "Homosassa, Florida" Quadrangle dated 1954, photo-revised 1988 were reviewed as part of this study. Copies of the topographic maps reviewed are provided in **CSER Appendix C**. A summary of findings for each pond alternative is included in **Table 4** below.

Table 4: Summary of USGS Topographic Map Review

Basin	Pond Site	Land Use	Contamination Concerns
2-5	Alt 1	Two small structures, roadway (Shady Knoll Place), wooded land (green shading), undeveloped land (unshaded)	No contamination concerns noted
	Alt 2	Wooded land (green shading)	No contamination concerns noted
	Alt 3	Wooded land (green shading), undeveloped land (unshaded)	No contamination concerns noted
	Alt 4	Wooded land (green shading), undeveloped land (unshaded)	No contamination concerns noted
2-6	Alt 1	Wooded land (green shading)	No contamination concerns noted
	Alt 2	Wooded land (green shading), mined land at south end	Mined land
	Alt 3	Wooded land (green shading)	No contamination concerns noted
2-7	Alt 1	Wooded land (green shading), one small structure at east boundary	No contamination concerns noted
	Alt 2	Wooded land (green shading), roadway (North Knoll Road)	No contamination concerns noted
	Alt 3	Wooded land (green shading), mined land	Mined land
-	DRA-E	Wooded land (green shading), one structure onsite in west area	No contamination concerns noted

Additional site-specific current land use details regarding facilities/sites of concern listed above are included in **Section 8**.

6.0 Hydrologic Features

6.1 Aquifers of Florida

The Floridan aquifer is found throughout Florida and extends into the southern portions of Alabama, Georgia, and South Carolina. This aquifer system is comprised of a sequence of limestone and dolomite, which thickens from about 250 feet in Georgia to about 3000 feet in south Florida. The Floridan aquifer system has been divided into an upper and lower aquifer separated by a unit of lower permeability. The upper Floridan aquifer is the principal source of water supply in most of north and central Florida. In the southern portion of the state, where it is deeper and contains brackish water, the aquifer has been used for the injection of sewage and industrial waste. Groundwater flow is generally from high elevations within the central portion of the state towards the east and west coasts.

In southwestern Florida, aquifers that lie between the surficial aquifer system and the Floridan aquifer system are collectively referred to as the intermediate aquifer system. This aquifer system starts in Hillsborough and Polk Counties and extends south through Collier County. The intermediate aquifer system is under confined conditions and is mainly comprised of permeable layers of sand, shell and limestone separated by clay confining units. It is the main source of water supply for Sarasota, Charlotte and Lee counties where the underlying Floridan aquifer contains brackish water. Much of the water pumped from this aquifer system is used for agriculture. In most places, water percolates down from the surficial aquifer system above to the intermediate aquifer system. Lateral flow is generally from a high area in Polk County towards major surface water features and the Gulf of Mexico.

The surficial aquifer system in Florida includes any otherwise undefined aquifers that are present at land surface. The surficial aquifer is mainly used for domestic, commercial, or small municipal supplies. The surficial aquifer system is generally under unconfined, or water table conditions and is made up of mostly unconsolidated sand, shelly sand, and shell. The aquifer thickness is typically less than 50 feet. Groundwater in the surficial aquifer generally flows from areas of higher elevation towards the coast or streams where it can discharge as base flow. Water enters the aquifer from rainfall and exits as base flow to streams, discharge to the coast, evapotranspiration, and downward recharge to deeper aquifers.

6.2 Hydrology – Site Reconnaissance

During the site reconnaissance, surface waters observed within the study area included manmade roadside ditches and stormwater ponds, and low, wet areas. No monitor wells, irrigation wells or potable wells were identified within the boundaries of the proposed pond sites during the site reconnaissance. Land generally sloped towards surrounding manmade drainage features, and low, wet areas within and near the project limits.

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6.3 Potentiometric Surface Map – Upper Floridan Aquifer

Tierra's review of the Potentiometric Surface Map dated September 2017 for the Upper Floridan Aquifer depicts groundwater flow direction generally toward the southwest. See Potentiometric Surface Map excerpt in **CSER Appendix F**.

7.0 Interviews

Communication with land owners, facility operators, residents, and governmental agencies can aid in the understanding of past and current land uses within the study area. Where possible or when necessary, interviews or requests for information are collected in an effort to identify potential concerns associated with petroleum storage tanks; automotive or marine, maintenance, service or repair facilities; dry-cleaning processes; and other industrial or agricultural operations that could affect the project. Documentation of interviews, if any, is provided in **CSER Appendix F**. An information request was emailed to FDEP Southwest District regarding the former limerock mine (Carroll's Lecanto Pit). However, no response has been received as of this writing.

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8.0 Project Impacts

8.1 Pond Sites

When facilities/sites are identified in proximity to the ROW, they are assigned a risk rating using the FDOT's standard methodology (High, Medium, Low or No). In a similar manner, pond sites are assigned a risk rating so they can be evaluated as part of the overall engineering design process. Details for the pond sites investigated are provided in **Table 5** below. Pond locations are shown on a recent aerial photograph presented in **CSER Appendix A**. Detailed information for the nearby sites of concern are presented in the table below.

Table 5: Pond Site Risk Rating Summary

Basin	Pond Site	Risk Rating	Comments
2-5	Alt 1	Low	**Current Land Use:** During the site reconnaissance, the majority of Pond 2-5, Alternative 1 was observed as woods and overgrown field with West Shady Knoll Place located within the southeastern area of the pond site. Residences are located onsite along the south side of West Shady Knoll Place. No obvious signs of fuel storage tanks, hazardous materials, buried debris, or other contamination concerns were noted. Surrounding properties in the vicinity of the pond site include Saint Michael the Archangel Church and a utility easement to the north; SR 44 to the south and west; and residences followed by a utility easement to the east. **Contamination Concern(s):** No contamination sites/facilities that would be expected to impact the project were noted within or in close proximity to the pond site boundaries. **Risk rating:** No contamination concerns were identified, therefore Pond 2-5, Alternative 1 is assigned a risk rating of Low.
	Alt 2	Low	**Current Land Use:** During the site reconnaissance, Pond 2-5, Alternative 2 was observed as woods. No obvious signs of fuel storage tanks, hazardous materials, buried debris, or other contamination concerns were noted. Surrounding properties in the vicinity of the pond site include woods and a residence to the north; Woods to the east; grassy field followed by a utility easement to the west; and a utility easement to the south. **Contamination Concern(s):** ***Maylen Property, located approximately 250 feet east of Pond 2-5, Alternative 2 –*** this listing was identified as Site 31 in the 2009 PD&E report and was assigned a risk rating of Medium. The 2009 PD&E noted several types of agricultural equipment and containers on the property. No regulatory information is available for this listing. During the site reconnaissance conducted on December 4, 2019, no agricultural equipment or suspect containers were observed within the boundaries of Pond 2-5, Alternative 2. This listing is not considered a contamination concern to Pond 2-5, Alternative 2. **Risk rating:** No contamination concerns were identified, therefore Pond 2-5, Alternative 2 is assigned a risk rating of Low.
	Alt 3	Low	**Current Land Use:** During the site reconnaissance, the majority of Pond 2-5, Alternative 3 was observed as open field with woods at the southwest boundary. No obvious signs of fuel storage tanks, hazardous materials, buried debris, or other contamination concerns were noted. Surrounding properties in the vicinity of the pond site include woods to the north and west; a utility easement to the south; and North Maylen Avenue followed by overgrown field and Crystal River Quarries to the east. **Contamination Concern(s):** ***Maylen Avenue DDMS, 261 North Maylen Avenue, located approximately 100 feet east of Pond 2-5, Alternative 3 –*** During the site reconnaissance, this site was observed as an overgrown field with no structures onsite. According to the EDM report and files found on FDEP's OCULUS database, this site is an inactive Disaster Debris Management Site (DDMS). When a hurricane/storm occurs, DDMS sites are utilized to store and process disaster debris. This site has not been utilized to store disaster debris as of the writing of this report. Therefore, this site is not considered a contamination concern to Pond 2-5, Alternative 3. ***Crystal River Quarries, 287 North Maylen Avenue, located approximately 70 feet east of Pond 2-5, Alternative 3 –*** During the site reconnaissance, this facility was observed as an active mine. This listing was identified as Site 30 in the 2009 PD&E report and was assigned a risk rating of Low. The facility currently maintains one 10,000-gallon diesel fuel aboveground storage tank (AST). No discharges or current violations are noted. Due to the regulatory status, this facility is not considered a contamination concern to Pond 2-5, Alternative 3. **Risk rating:** No contamination concerns were identified, therefore Pond 2-5, Alternative 3 is assigned a risk rating of Low.
	Alt 4	No	**Current Land Use:** During the site reconnaissance, Pond 2-5, Alternative 4 was observed as an existing retention pond in the southwest area and woods throughout the remaining area of the pond alternative. No obvious signs of fuel storage tanks, hazardous materials, buried debris, or other contamination concerns were noted. Surrounding properties in the vicinity of the pond site include woods to the north, east, and west; and SR 44 to the south. **Contamination Concern(s):** No contamination sites/facilities that would be expected to impact the project were noted within or in close proximity to the pond site boundaries. **Risk rating:** No contamination concerns were identified, therefore Pond 2-5, Alternative 4 is assigned a risk rating of No.

Table 5: Pond Site Risk Rating Summary

Basin	Pond Site	Risk Rating	Comments
2-6	Alt 1	Low	**Current Land Use:** During the site reconnaissance, Pond 2-6, Alternative 1 was observed as open excavations with soil stockpiles throughout. The excavations and stockpiles onsite do not appear to be associated with the former mining operations located offsite, adjacent east. No obvious signs of fuel storage tanks, hazardous materials, buried debris, or other contamination concerns were noted. Surrounding properties in the vicinity of the pond site include woods to the north and west; a former limerock mine to the east; and open field followed by Providence Baptist Church to the south. **Contamination Concern(s):** ***Former Limerock Mine, 1150 North Maylen Avenue, located offsite, adjoining east of Pond 2-6, Alternative 1 –*** during the site reconnaissance, this site was observed as an inactive limerock mine with vegetation growing in the remaining open excavation pits. This facility was identified as Site 33 in the 2009 PD&E report and was assigned a risk rating of No. The 2009 PD&E noted a large excavated area with overgrown vegetation throughout. No contamination concerns were observed in 2009 or during the site reconnaissance conducted on December 4, 2019. Documents found on the USGS Mineral Resource database indicates that this facility formerly operated as a limerock mining facility known as Carroll's Lecanto Pit (AKA Lecanto Materials Co.). No further information is available on the USGS online database. An email was sent to FDEP's Public Records department requesting additional information about this site. No response was received as of the writing of this report. See email and USGS excerpts in **CSER Appendix F**. This facility is not considered a contamination concern to Pond 2-6, Alternative 1. **Risk rating:** No contamination concerns were identified, therefore Pond 2-6, Alternative 1 is assigned a risk rating of Low.
	Alt 2	Low	**Current Land Use:** During the site reconnaissance, Pond 2-6, Alternative 2 was observed as open field and woods. No obvious signs of fuel storage tanks, hazardous materials, buried debris, or other contamination concerns were noted. Surrounding properties in the vicinity of the pond site include woods to the north and east; a former limerock mine to the south; and residences to the west. ***Former Limerock Mine, 1150 North Maylen Avenue, located adjacent south of Pond 2-6, Alternative 2 –*** during the site reconnaissance, this site was observed as an inactive limerock mine with vegetation growing in the remaining open excavation pits. This facility was identified as Site 33 in the 2009 PD&E report and was assigned a risk rating of No. The 2009 PD&E noted a large excavated area with overgrown vegetation throughout. No contamination concerns were observed in 2009 or during the site reconnaissance conducted on December 4, 2019. Documents found on the USGS Mineral Resource database indicates that this facility formerly operated as a limerock mining facility known as Carroll's Lecanto Pit (AKA Lecanto Materials Co.). No further information is available on the USGS online database. An email was sent to FDEP's Public Records department requesting additional information about this site. No response was received as of the writing of this report. See email and USGS excerpts in **CSER Appendix F**. This facility is not considered a contamination concern to Pond 2-6, Alternative 2. **Risk rating:** No contamination concerns were identified, therefore Pond 2-6, Alternative 2 is assigned a risk rating of Low.
	Alt 3	Low	**Current Land Use:** During the site reconnaissance, Pond 2-6, Alternative 3 was observed as open field, woods, and a construction site. The south and east ends of the pond site are comprised of open field. The majority of the pond site consists of woods. What appears to be a residence is being constructed onsite in eastern area of the pond site. A small shooting range with assorted targets and spent bullet casings on the ground were situated in front of a soil berm located offsite north of the northwest corner of the pond site. The shooting range is not a commercial operation. It appears to be associated with personal use. Surrounding properties in the vicinity of the pond site include woods to the north and east; open field to the south; and open field followed by a residence to the west. **Contamination Concern(s):** ***Shooting range, located approximately 60 feet north of Pond 2-6, Alternative 3 –*** A small shooting range was observed approximately 60 feet north of the pond site (coordinates: 28.88448611° -82.50888889°). The range consisted of household plastic items placed directly on land surface and paper targets attached to wooden boards in front of a soil berm measuring approximately 5 feet tall and 30 feet wide. Spent bullet casings were noted throughout the shooting range area. Due to the separation distance (60 feet), the soil berm is not considered a contamination concern to Pond 2-6, Alternative 3. **Risk rating:** No contamination concerns were identified, therefore Pond 2-6, Alternative 3 is assigned a risk rating of Low.
2-7	Alt 1	Low	**Current Land Use:** During the site reconnaissance, Pond 2-7, Alternative 1 was observed as woods. Two steel 55-gallon drums, wooden boards, and metal shelves were observed in the east central area of the pond site. Surrounding properties in the vicinity of the pond site include Damron Auto Salvage to the north; and woods to the south, east, and west. **Contamination Concern(s):** ***Damron Auto Salvage/LKQ, located approximately 60 feet north of Pond 2-7, Alternative 1 –*** During the site reconnaissance, this facility was observed as an active automotive salvage yard**.** This listing was identified as Site 15 in the 2009 PD&E report and was assigned a risk rating of Low. The 2009 PD&E noted this facility as an automotive salvage yard that maintained a 500-gallon non-regulated diesel fuel AST and was identified as a registered small quantity generator (SQG) of hazardous waste with no violations reported. Currently, this facility maintains two 500-gallon unleaded gasoline ASTs. One diesel fuel discharge was reported on August 9, 2016 and was granted No Further Action (NFA) status on October 6, 2016. No current contamination concerns are reported. Therefore, this facility is not considered a contamination concern to Pond 2-7, Alternative 1. ***Empty drums, located in east central area of Pond 2-7, Alternative 1 –*** Two steel 55-gallon drums, wooden boards, and metal shelves were observed in the east central area of the pond site. A small amount of shotgun shells were observed near the area. The drums were rusted and empty with bullet holes visible. These discarded items did not appear to be used extensively for target practice such that spent bullets would be a concern. No unusual odors, stressed vegetation, soil staining, or other indications of contamination were noted. This site is not considered a contamination concern to Pond 2-7, Alternative 1. **Risk rating:** No contamination concerns were identified, therefore Pond 2-7, Alternative 1 is assigned a risk rating of Low.

Table 5: Pond Site Risk Rating Summary

Basin	Pond Site	Risk Rating	Comments
2-7	Alt 2	Low	**Current Land Use:** During the site reconnaissance, Pond 2-7, Alternative 2 was observed as woods with an area of overgrown field at the south end of the pond site. No obvious signs of fuel storage tanks, hazardous materials, buried debris, or other contamination concerns were noted. Surrounding properties in the vicinity of the pond site include Damron Auto Salvage to the north; and woods to the south, east, and west. **Contamination Concern(s):** ***Citrus Sand and Debris, Inc., 1590 North Quarterback Terrace, located approximately 180 feet west of Pond 2-7, Alternative 2 –*** During the site reconnaissance, this facility was observed as an inactive open pit sand mine**.** This listing was identified as Site 17 in the 2009 PD&E report and was assigned a risk rating of Low. The 2009 PD&E identified this facility as an open pit sand mining operation. No regulatory information was provided during the 2009 evaluation. Three closed landfill cells are located in the southeast portion of the property. The landfill cells were permitted to receive Construction and Demolition (C&D) waste, yard trash, tires, asbestos, carpet, glass, plastic, and furniture. The most recent analytical data included in the 1st Semi-annual Water Quality Monitoring report dated July 10, 2019 indicates that concentrations of arsenic above the Groundwater Cleanup Target Level (GCTL) were detected in one monitoring well (MW-7R), dissolved iron concentrations were detected above GCTLs in three monitoring wells (MW-4R, MW-5R, MW-7R), and concentrations of nitrogen ammonia above GCTLs were detected in one monitoring well (MW-4R). The dissolved iron concentrations are presumed to be naturally occurring aquifer constituents based on historical sampling data. The nearest contaminated monitoring well is located approximately 800 feet southwest of Pond 2-7, Alternative 2. Groundwater flow direction was measured to the southwest (away from Pond 2-7, Alternative 2). Additionally, two 1,000-gallon ASTs were formerly maintained onsite (one removed in 2012, one removed at an unknown date). No location information was found. No discharges are reported. Although GCTL exceedances were detected onsite during the most recent sampling event, due to the separation distance from the pond site (800 feet), this facility is not considered a contamination concern to Pond 2-7, Alternative 2. ***Mars LLC, 1959 North Iron Point Road, located adjacent east of the northern portion of Pond 2-7, Alternative 2 –*** During the site reconnaissance, this facility was observed as warehouses with numerous tenants including Keep it Safe Storage & Moving and Penske Truck Rental. This site was registered as a SQG on July 14, 2008. The facility was closed on May 28, 2009 and is no longer regulated. No discharges or other contamination concerns were reported. This site is not considered a contamination concern to Pond 2-7, Alternative 2. **Risk rating:** No contamination concerns were identified, therefore Pond 2-7, Alternative 2 is assigned a risk rating of Low.
	Alt 3	Low	**Current Land Use:** During the site reconnaissance, Pond 2-7, Alternative 3 was observed as part of an inactive open pit sand mine. Woods were noted in the northwest area of the pond site and soil stockpiles were observed sporadically throughout the western portion of the pond site. No obvious signs of fuel storage tanks, hazardous materials, buried debris, or other contamination concerns were noted. Surrounding properties in the vicinity of the pond site include CR 486 to the north; and an inactive sand mine to the south, east, and west. **Contamination Concern(s):** ***Citrus Sand and Debris, Inc., 1590 North Quarterback Terrace, located within the boundaries of Pond 2-7, Alternative 3 –*** During the site reconnaissance, this facility was observed as an inactive open pit sand mine**.** This listing was identified as Site 17 in the 2009 PD&E report and was assigned a risk rating of Low. The 2009 PD&E identified this facility as an open pit sand mining operation. No regulatory information was provided during the 2009 evaluation. Three closed landfill cells are located in the southeast portion of the property. The landfill cells were permitted to receive Construction and Demolition (C&D) waste, yard trash, tires, asbestos, carpet, glass, plastic, and furniture. The most recent analytical data included in the 1st Semi-annual Water Quality Monitoring report dated July 10, 2019 indicates that concentrations of arsenic above the GCTL were detected in one monitoring well (MW-7R), dissolved iron concentrations were detected above GCTLs in three monitoring wells (MW-4R, MW-5R, MW-7R), and concentrations of nitrogen ammonia above GCTLs were detected in one monitoring well (MW-4R). The dissolved iron concentrations are presumed to be naturally occurring aquifer constituents based on historical sampling data. The nearest contaminated monitoring well is located approximately 1,400 feet south of Pond 2-7, Alternative 3. Groundwater flow direction was measured to the southwest (away from Pond 2-7, Alternative 3). Additionally, two 1,000-gallon ASTs were formerly maintained onsite (one removed in 2012, one removed at an unknown date). No location information was found. No discharges are reported. Although GCTL exceedances were detected onsite during the most recent sampling event, due to the separation distance from the pond site (1,400 feet), this facility is not considered a contamination concern to Pond 2-7, Alternative 3. **Risk rating:** No contamination concerns were identified, therefore Pond 2-7, Alternative 3 is assigned a risk rating of Low.
-	DRA-E	Low	**Current Land Use:** During the site reconnaissance, DRA-E was observed as woods with a residence onsite in the western area. No obvious signs of fuel storage tanks, hazardous materials, buried debris, or other contamination concerns were noted. Surrounding properties in the vicinity of the pond site include woods to the north, east, and west; and SR 44 to the south. **Contamination Concern(s):** No contamination sites/facilities that would be expected to impact the project were noted within or in close proximity to the pond site boundaries. **Risk rating:** No contamination concerns were identified, therefore DRA-E is assigned a risk rating of Low.

9.0 Conclusions and Recommendations

A total of eleven pond site alternatives were evaluated as part of this Contamination Screening Evaluation Report. **Table 6** below presents a summary of the risk ratings assigned to each pond site alternative:

Table 6 – Pond Alternative Risk Rating Summary

Basin	Pond Site	Risk Rating	Notes
2-5	Alt 1	Low	Woods, overgrown field, residences along Shady Knoll Place
	Alt 2	Low	Woods
	Alt 3	Low	Open field, woods
	Alt 4	No	Overgrown field, woods, existing retention pond
2-6	Alt 1	Low	Open soil excavations with soil stockpiles throughout; offsite, adjoining east is an inactive limerock mine
	Alt 2	Low	Woods and one residence
	Alt 3	Low	Open field, woods
2-7	Alt 1	Low	Woods, two empty 55-gallon drums in east central area; no contamination concerns noted
	Alt 2	Low	Woods, overgrown field
	Alt 3	Low	Inactive open pit sand mine
-	DRA-E	Low	Woods and one residence

Based on the conclusions of the study and the risk ratings noted above, the following recommendations are made for this project:

- Additional information may become available or site-specific conditions may change from the time this report was prepared and should be considered prior to acquiring right-of-way and/or proceeding with roadway construction.
- For the locations rated No or Low for potential contamination, no further action is required. These pond locations have been evaluated and determined not to have any contamination risk to the study area at this time.
- Once final design plans are available, additional review is recommended in consideration of dewatering operations that may be necessary under the National Pollutant Discharge Elimination System Generic Permit for Stormwater Discharges from Large and Small Construction Activities.

Verification testing may be warranted for contamination issues within 500 feet of the dewatering area.

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CSER APPENDIX A

Project Location and Pond Alternative Location Maps

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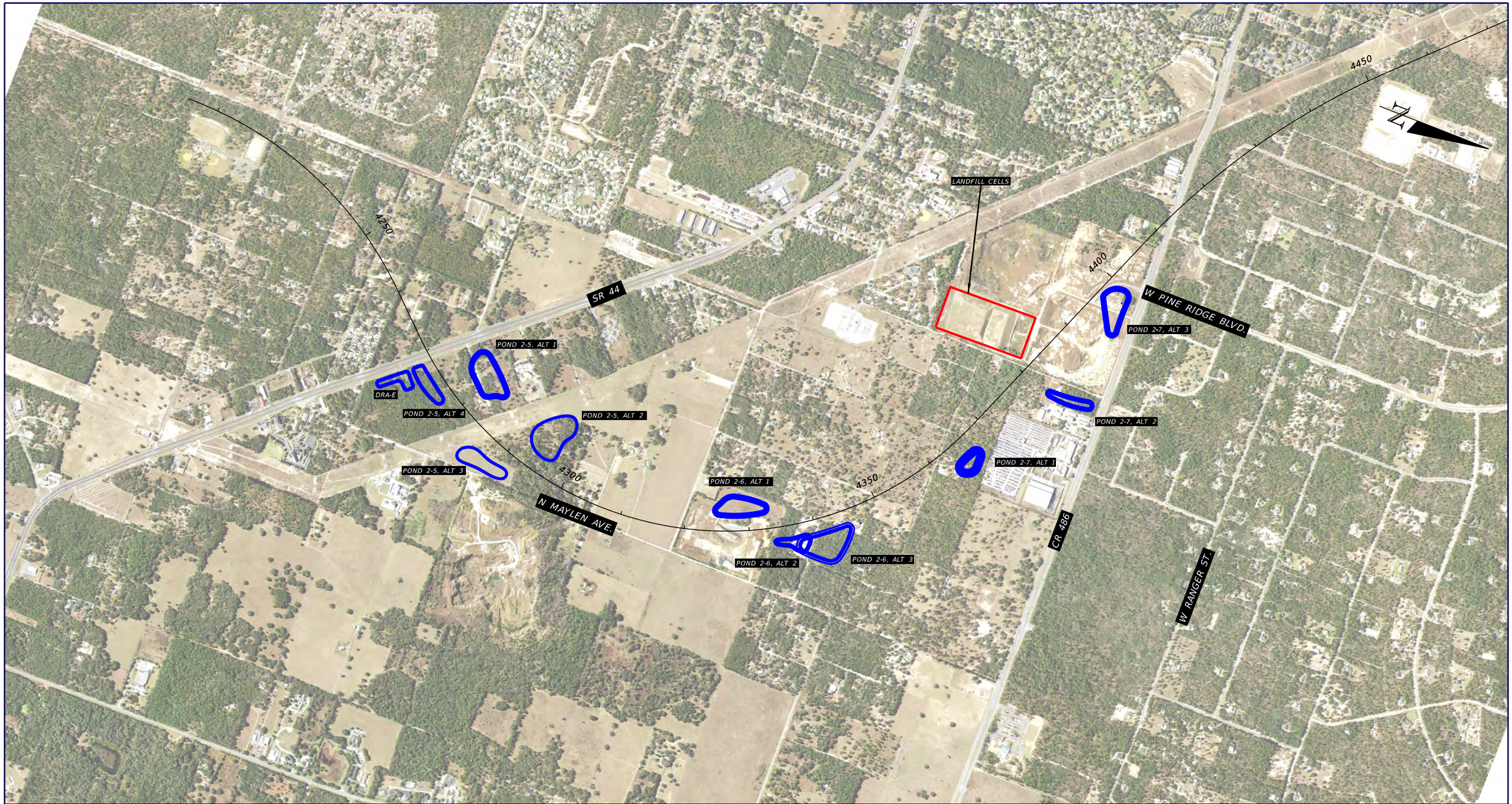


SOURCE: FDOT SURVEY AND MAPPING DATED 2017

0 300 1500
Feet

PROJECT LOCATION MAP

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

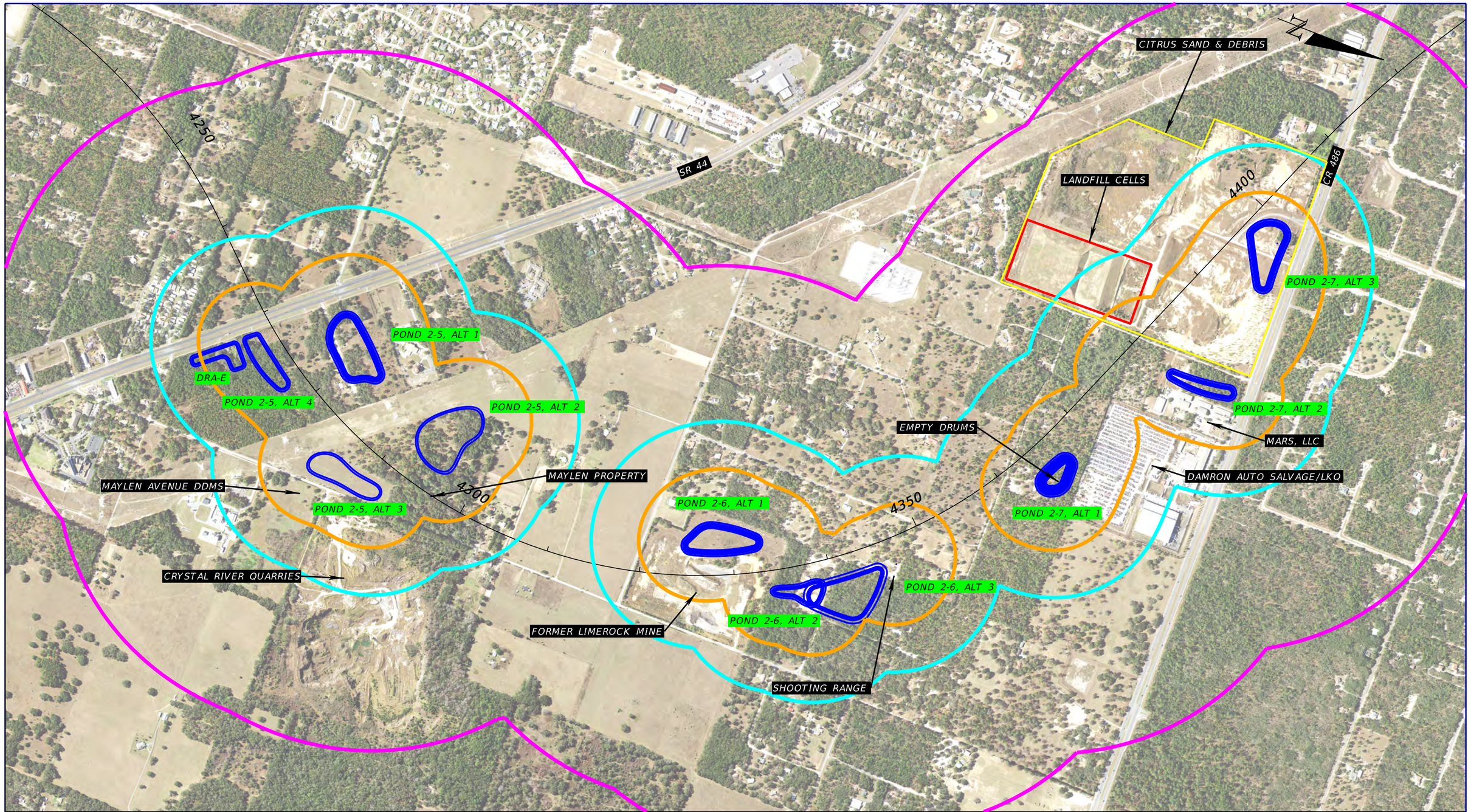
TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637
CERTIFICATE OF AUTHORIZATION 6486

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486

SHEET NO.
A-1



500 FEET RADIUS

1,000 FEET RADIUS

0.5 MILE RADIUS

POND

SOURCE: FDOT SURVEY AND MAPPING DATED 2017

0 200 1000
Feet

POND ALTERNATIVES LOCATION MAP

POND NAME GREEN = NO/LOW RISK RATING

POND NAME RED = HIGH/MEDIUM RISK RATING

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637
CERTIFICATE OF AUTHORIZATION 6486

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486

SHEET NO.
A-2

bgarcia 9/15/2020 4:08:44 PM J:\6511\2018 Files\6511-18-108 Suncoast Pkwy 2\Microstation\pdgeoEnvAlts01.dgn

CSER APPENDIX B

Historical Aerial Photographs

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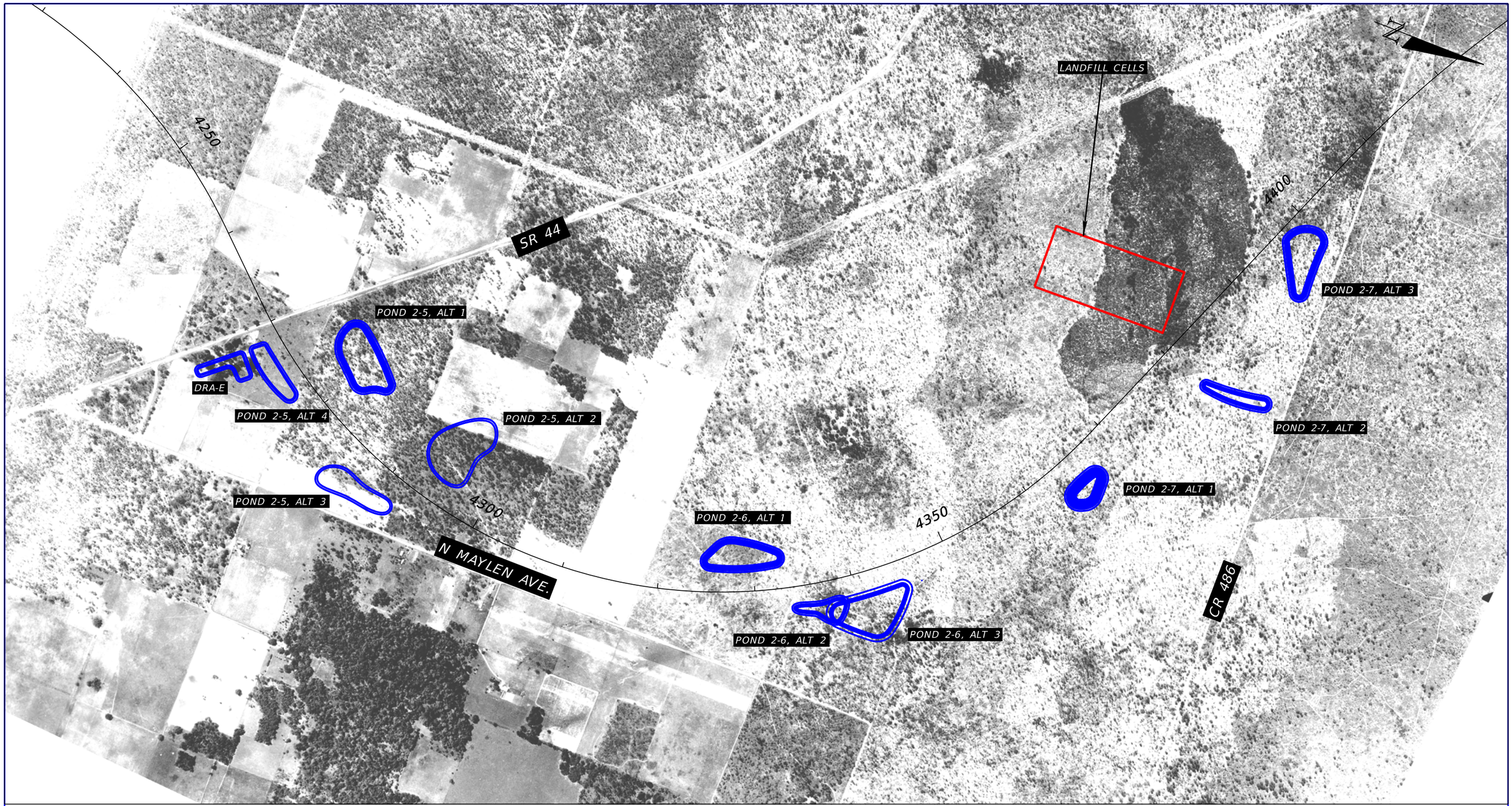

SOURCE: UNIVERSITY OF FLORIDA

1951 HISTORICAL AERIAL PHOTOGRAPH

0 200 1000
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637
CERTIFICATE OF AUTHORIZATION 6486

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486

SHEET NO.
B-1

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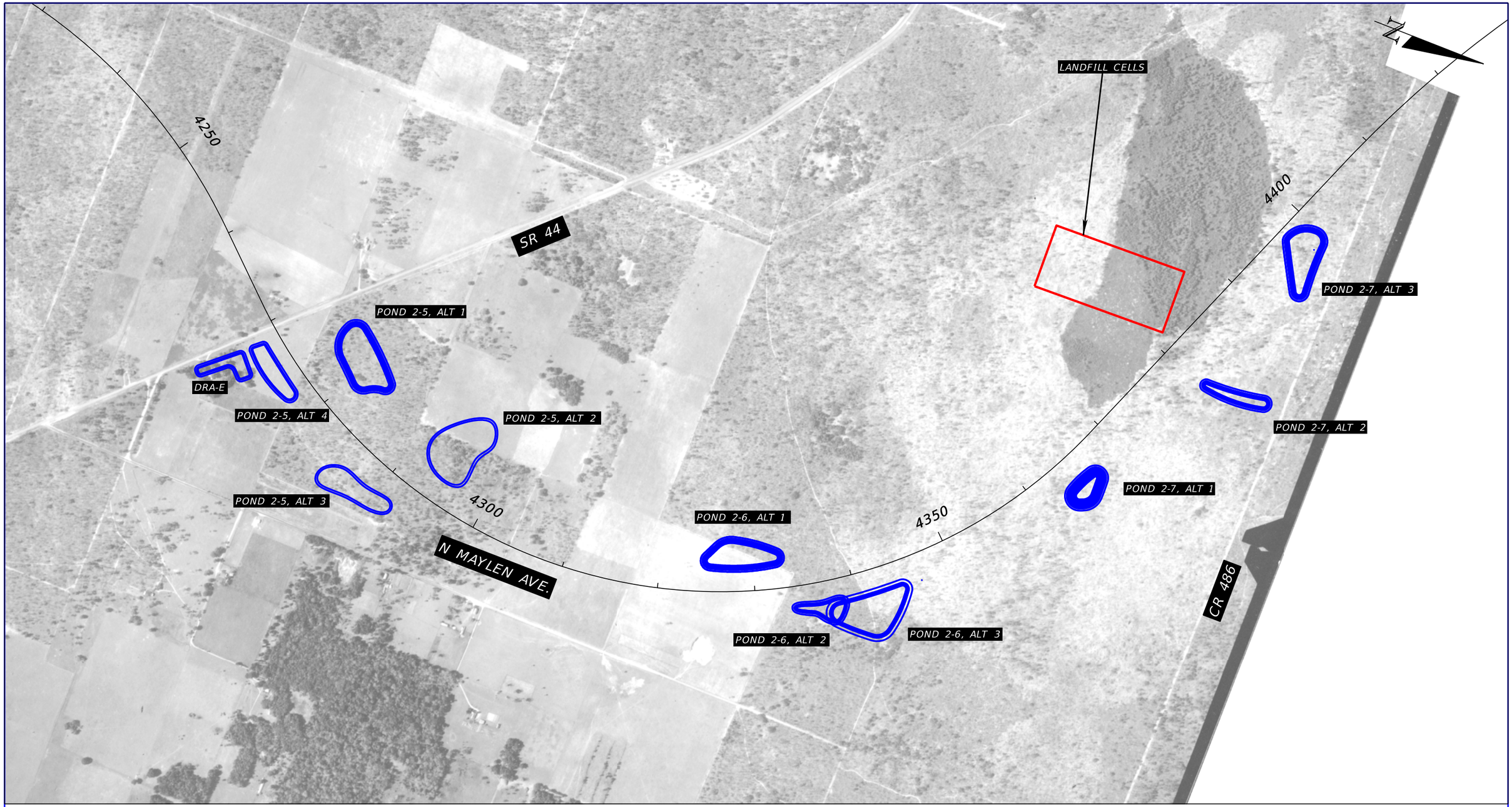


SOURCE: UNIVERSITY OF FLORIDA

1960 HISTORICAL AERIAL PHOTOGRAPH

0 200 1000
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637
CERTIFICATE OF AUTHORIZATION 6486

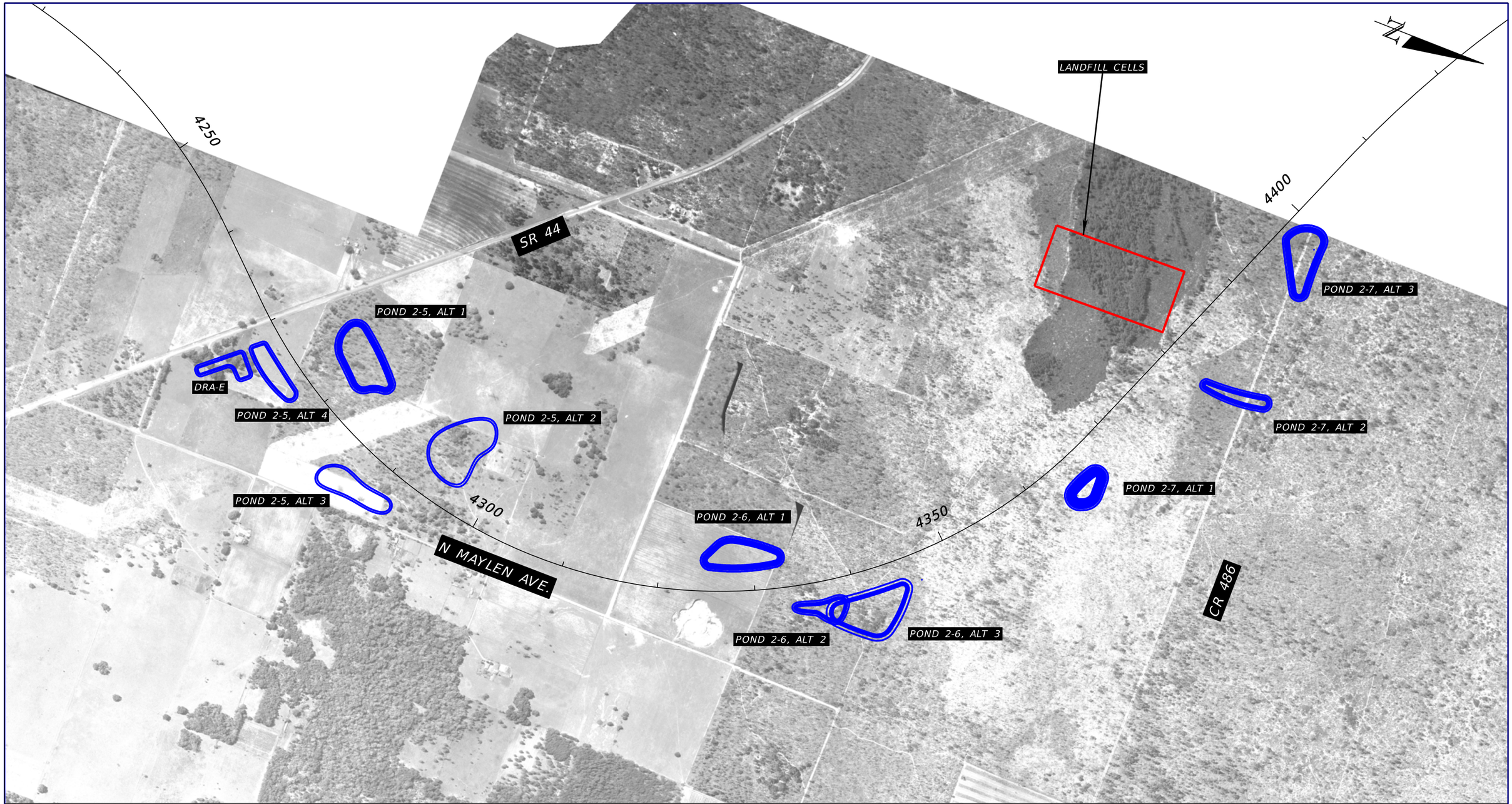
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486

SHEET NO.
B-2

bgarcia 9/15/2020 1:36:58 PM J:\6511\2018 Files\6511-18-108 Suncoast Pkwy 2\Microstation\pdgeoEnvHist1960.dgn



SOURCE: FDOT SURVEY AND MAPPING

1967 HISTORICAL AERIAL PHOTOGRAPH

0 200 1000
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637
CERTIFICATE OF AUTHORIZATION 6486

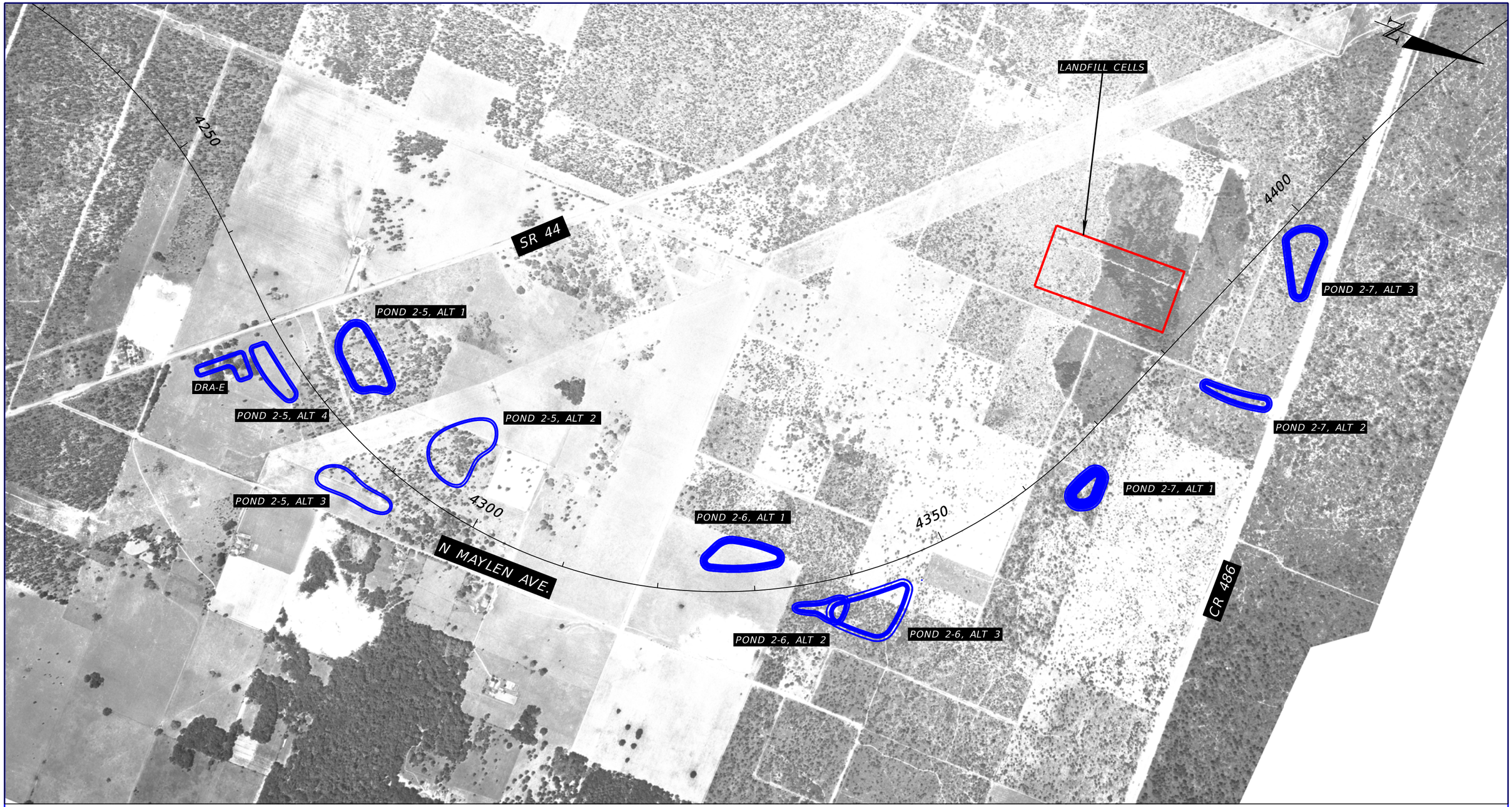
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486

SHEET NO.
B-3

bgarcia 9/15/2020 1:37:06 PM J:\6511\2018 Files\6511-18-108 Suncoast Pkwy 2\Microstation\pdgeoEnvHist1967.dgn



SOURCE: FDOT SURVEY AND MAPPING

1973 HISTORICAL AERIAL PHOTOGRAPH

0 200 1000
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637
CERTIFICATE OF AUTHORIZATION 6486

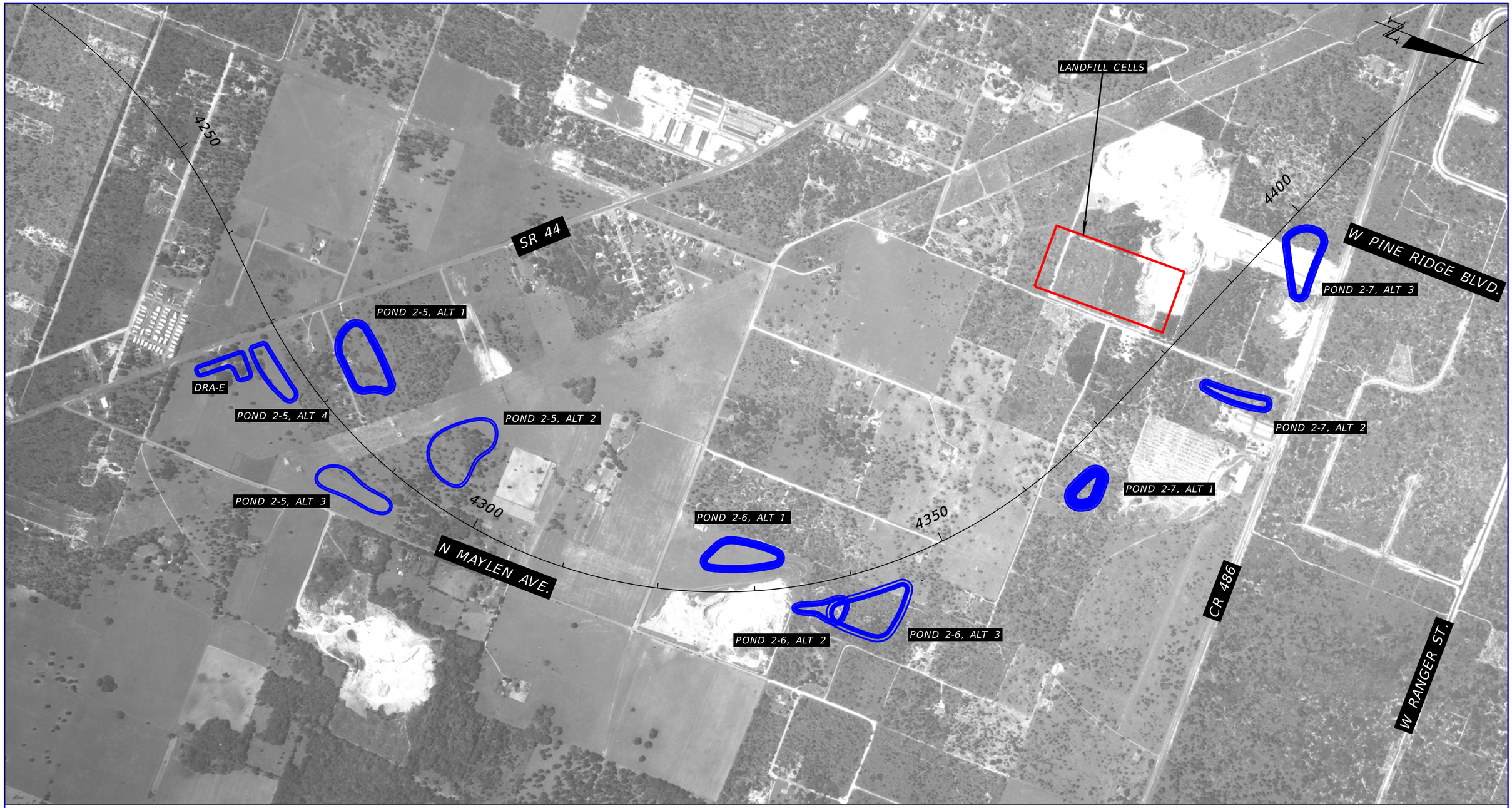
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486

SHEET NO.
B-4

bgarcia 9/15/2020 1:37:23 PM J:\6511\2018 Files\6511-18-108 Suncoast Pkwy 2\Microstation\pdgeoEnvHist1973.dgn



SOURCE: FDOT SURVEY AND MAPPING

1985 HISTORICAL AERIAL PHOTOGRAPH

0 200 1000
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637
CERTIFICATE OF AUTHORIZATION 6486

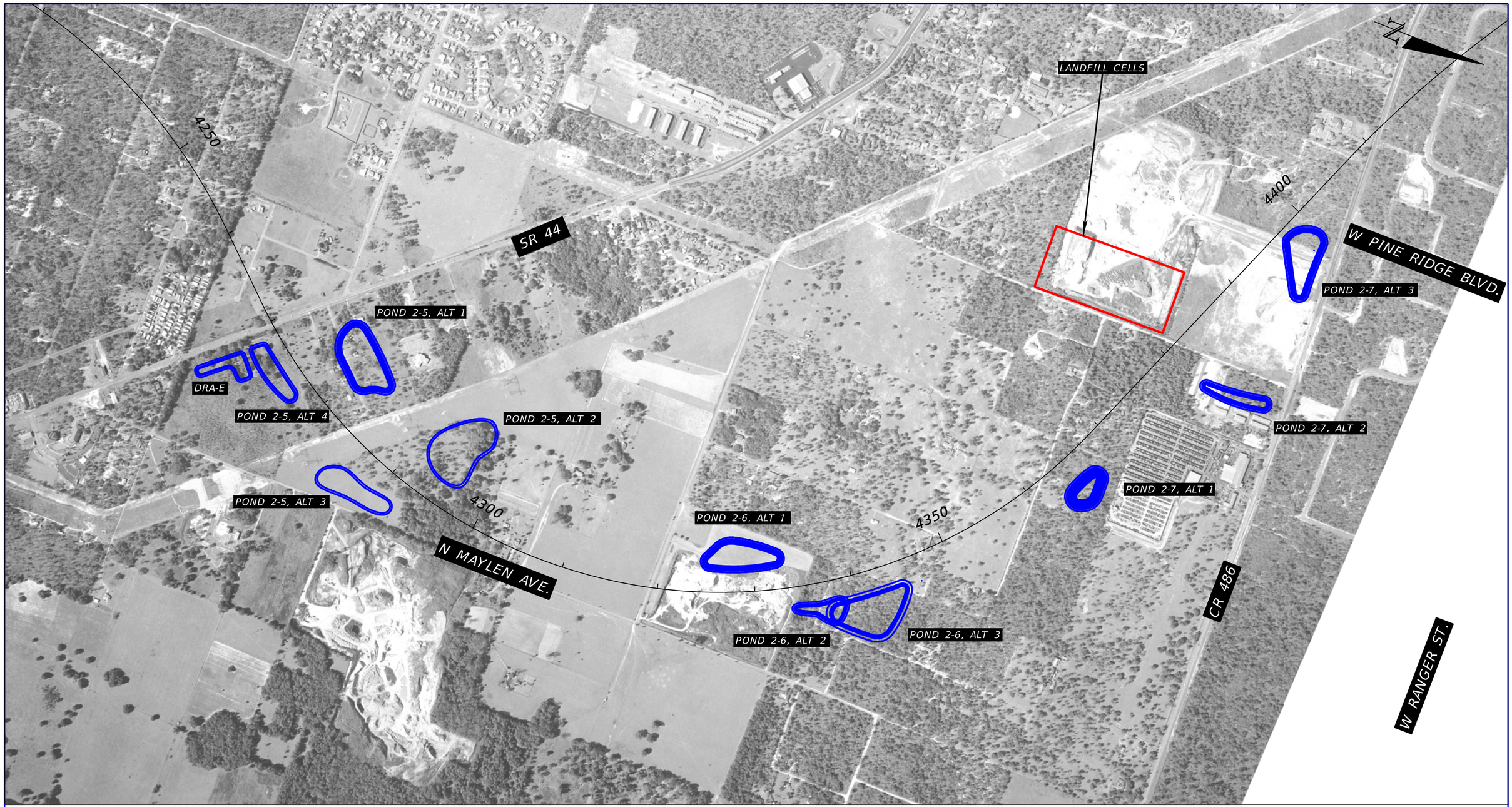
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486

SHEET NO.
B-5

bgarcia 9/15/2020 1:37:39 PM J:\6511\2018 Files\6511-18-108 Suncoast Pkwy 2\Microstation\pdgeoEnvHist1985.dgn



SOURCE: FDOT SURVEY AND MAPPING

1995 HISTORICAL AERIAL PHOTOGRAPH

0 200 1000
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637
CERTIFICATE OF AUTHORIZATION 6486

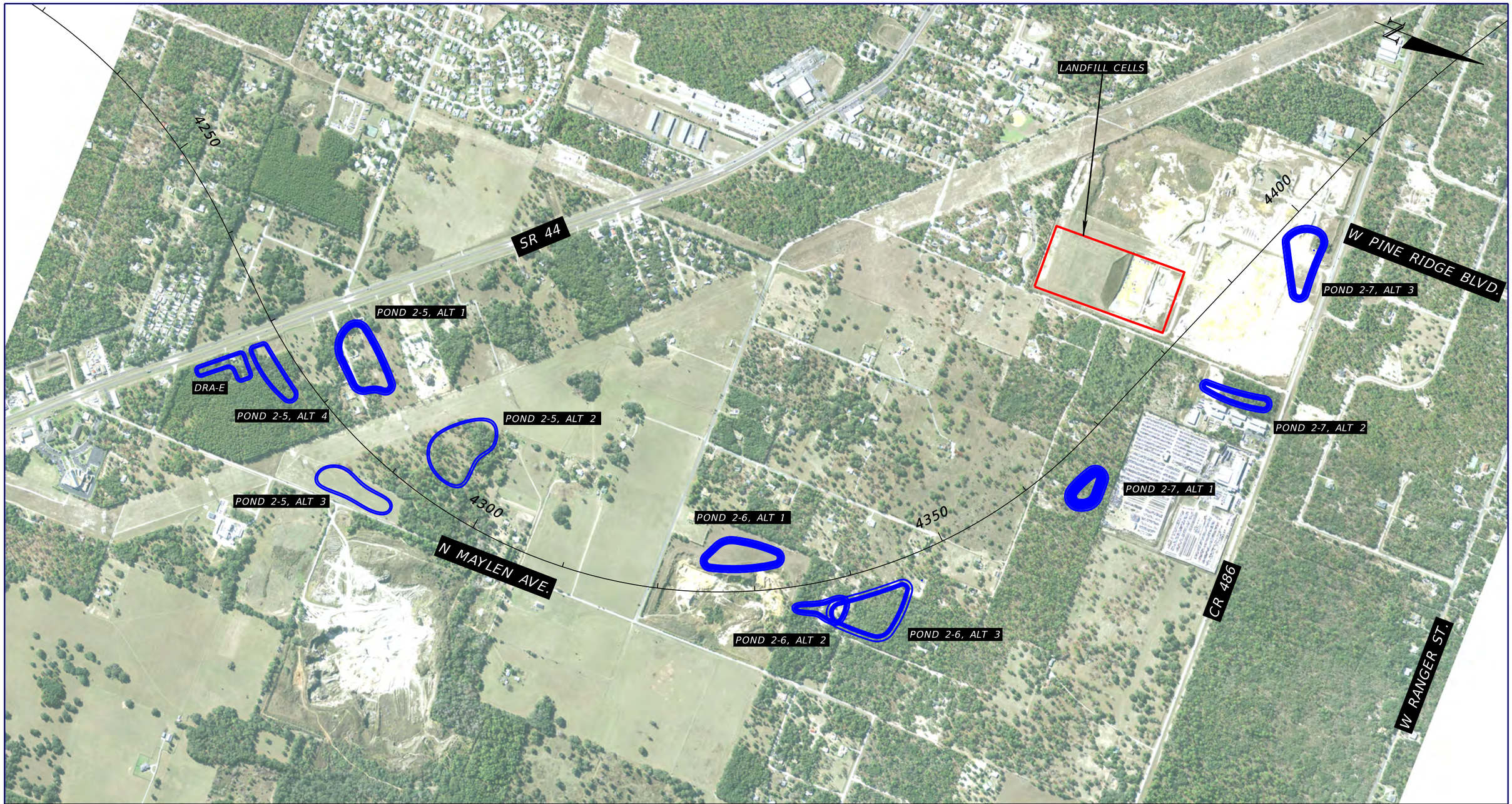
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486

SHEET NO.
B-6

bgarcia 9/15/2020 1:38:01 PM J:\6511\2018 Files\6511-18-108 Suncoast Pkwy 2\Microstation\pdgeoEnvHist1995.dgn



SOURCE: FDOT SURVEY AND MAPPING

2009 HISTORICAL AERIAL PHOTOGRAPH

0 200 1000
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637
CERTIFICATE OF AUTHORIZATION 6486

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486

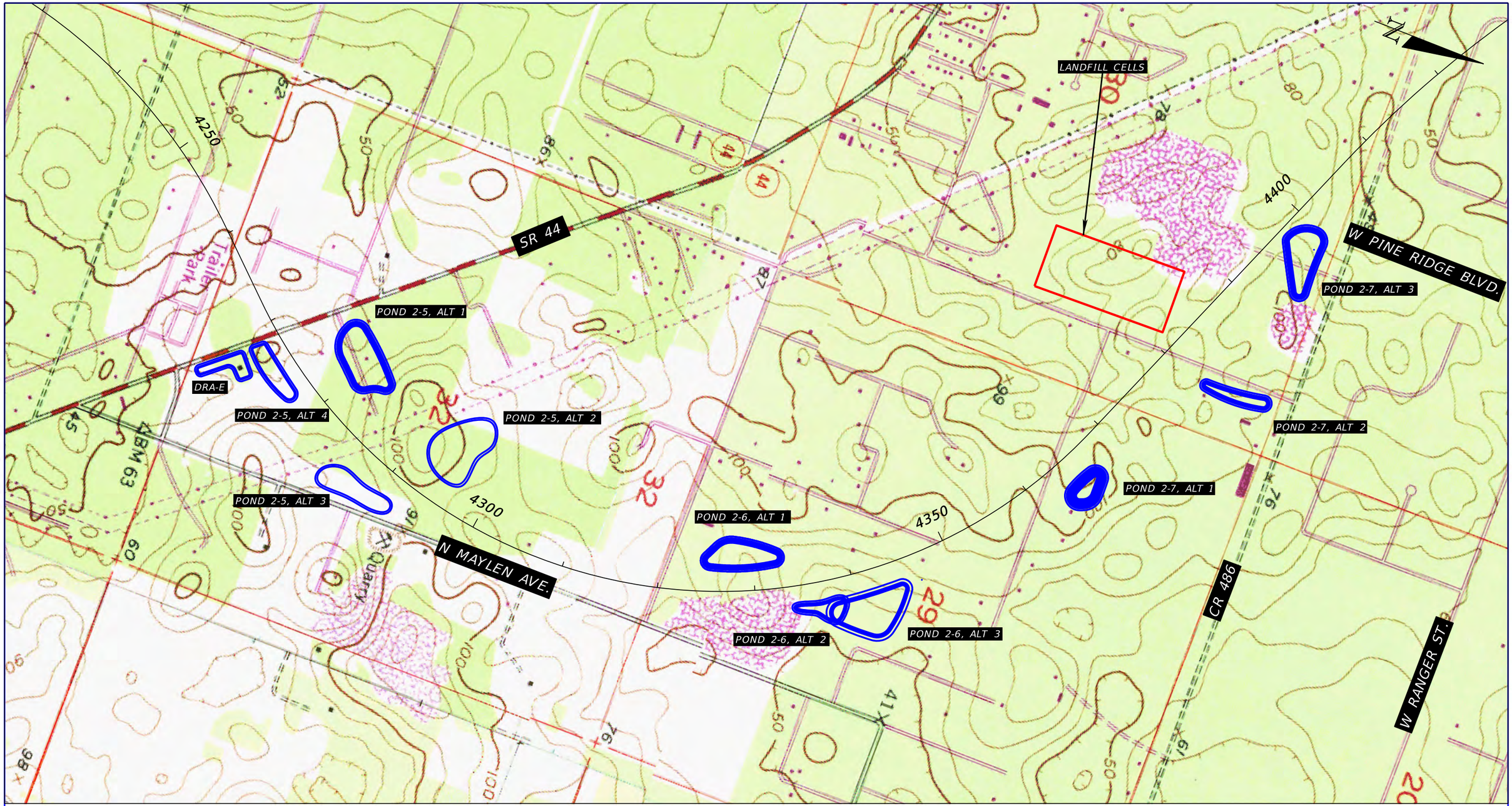
SHEET NO.
B-7

bgarcia 9/15/2020 1:38:16 PM J:\6511\2018 Files\6511-18-108 Suncoast Pkwy 2\Microstation\pdgeoEnvHist2009.dgn

CSER APPENDIX C

USGS Topographic Map

DRAFT



SOURCE: USGS 7.5-MINUTE "CRYSTAL RIVER, FLORIDA" DATED 1954, (PHOTOREVISED 1988)
SOURCE: USGS 7.5-MINUTE "HOMOSASSA, FLORIDA" DATED 1954, (PHOTOREVISED 1988)

USGS TOPOGRAPHIC MAP

0 200 1000
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637
CERTIFICATE OF AUTHORIZATION 6486

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486

SHEET NO.
C-1

bgarcia 9/15/2020 4:05:54 PM J:\6511\2018 Files\6511-18-108 Suncoast Pkwy 2\Microstation\pdgeoEnvTOP001.dgn

CSER APPENDIX D

Environmental Database Report

DRAFT

Environmental Data Report

Custom Radius Research

Suncoast Parkway 2
from SR 44 to CR 486
Citrus County, Florida

Prepared For:

Tierra Inc
7351 Temple Terrace Hwy
Tampa, FL 33637

Prepared By:

Environmental Data Management, Inc.
2840 West Bay Drive, Suite 208
Largo, Florida 33770

September 10, 2020

DRAFT

Environmental Data Management, Inc.
2840 West Bay Drive, Suite 208
Largo, Florida 33770
Tel. (727) 586-1700
http://www.edm-net.com

September 10, 2020

Justin Holley
Tierra Inc
7351 Temple Terrace Hwy
Tampa, FL 33637

Subject: **Custom Radius Research - EDM Project #25271**

Dear Mr. Holley

Thank you for choosing Environmental Data Management, Inc. The following report provides the results of our environmental data research that you requested for the following location:

Suncoast Parkway 2
from SR 44 to CR 486
Citrus County, Florida

The following is a summary of the components contained within this report:

- **Executive Summary** –lists the databases that were searched for this report, the search distance criteria and the number of sites identified for each database.
- **Map of Study Area**– street map showing the location of the Subject Property and any regulatory listed sites identified within the search criteria.
- **Site Summary Table** –displays the Map ID number, Permit or Registration number, Name/Address and the Government Database(s) for the identified regulatory listed sites.
- **Detail Reports** – data detail for each database record identified.
- **Proximal Records Table** – a listing of potentially relevant sites identified just beyond the search criteria.
- **Non-Mapped Records Table** - lists those government records that do not contain sufficient address information to plot within our GIS system, but may still exist within your study area.
- **Addl Maps (where applicable)** – includes Recent Aerial Photo, USGS Topographic maps, FEMA Floodplain & NWI Wetland Map, map of statewide American Indian Lands and our Environmental Impact Areas map, showing the location of suspect sites such as NPL/STNPL, Brownfields, FUDS, etc.... Our Florida well data report is also include with the Standard and Comprehensive formats.
- **Agency List Descriptions –** defines the regulatory databases included in this report along with the dates that each database was last updated by the respective agency and EDM.

At EDM we take great pride in our work, and continually strive to provide you with the most accurate and thorough research service available. This report is only intended as a means to assist in identifying locations that may pose an environmental concern relative to the property under evaluation. Its use is not intended to replace the need for a complete environmental assessment or regulatory file review, but rather as a supplement to the overall evaluation.

Thank you again for selecting EDM as your data research provider. Should you have any questions regarding this report or our service, please feel free to contact us. We appreciate the opportunity to be of service to you and look forward to working with you in the future.

ENVIRONMENTAL DATA MANAGEMENT, INC.

Executive Summary

Report Date: 9/10/2020

Client Information	Project Information
Tierra Inc 7351 Temple Terrace Hwy Tampa, FL 33637 Client Job No: 6511-18-108E Client P.O. No:	Custom Radius Research Suncoast Parkway 2 from SR 44 to CR 486 Citrus County, Florida EDM Job No# 25271

The following table displays the databases that were included in the research provided and the number of records identified for each database. Site distance values indicated in this report are measured from the boundary of the Subject Property. The absence of records in this table and the Site Summary Tables indicates that our research found no regulated sites within the specified search distances from the Subject Property.

	Max Search Radius (Feet)	Subject Property	From 0 - 500 feet	From 500.01 - 1000 feet	From 1000.01 - 2640 feet	Total # Found
EPA DATABASES						
National Priorities List(NPL)	2640	0	0	0	0	**0**
SEMS Active Site Inventory List(SEMSACTV)	2640	0	0	0	0	**0**
Comp Env Resp, Compensation & Liability Info Sys List(CERCLIS)	2640	0	0	0	0	**0**
SEMS Archived Site Inventory List(SEMSARCH)	2640	0	0	0	0	**0**
Archived Cerclis Sites(NFRAP)	500	0	0	N/A	N/A	**0**
Emergency Response Notification System List(ERNS)	500	0	0	N/A	N/A	**0**
RCRIS Handlers with Corrective Action(CORRACTS)	500	0	0	N/A	N/A	**0**
Tribal Tanks List(TRIBLTANKS)	500	0	0	N/A	N/A	**0**
Tribal Lust List(TRIBLLUST)	500	0	0	N/A	N/A	**0**
Brownfields Management System(USBRWNFLDS)	500	0	0	N/A	N/A	**0**
Institutional and/or Engineering Controls(USINSTENG)	500	0	0	N/A	N/A	**0**
NPL Liens List(NPLLIENS)	500	0	0	N/A	N/A	**0**
RCRA-Treatment, Storage and/or Disposal Sites(TSD)	500	0	0	N/A	N/A	**0**
RCRA-LQG,SQG,CESQG and Transporters(NONTSD)	500	0	0	N/A	N/A	**0**

DRAFT

*** Disclaimer ***
Please understand that the regulatory databases we utilize were not originally intended for our use, but rather for the source agency's internal tracking of sites for which they have jurisdiction or other interest. As a result of this difference in intended use, their data is frequently found to be incomplete or inaccurate, and is less than ideal for our use. Our report is not to be relied upon for any purpose other than to "point" at approximate locations where further evaluation may be warranted. No conclusion can be based solely upon our report. Rather, our report should be used as a first step in directing your attention at potential problem areas, which should be followed up by site inspections, interviews with relevant personnel, regulatory file review and other means as specified in the ASTM Standard E 1527-13. Readers proceed at their own risk in relying upon this data, in whole or in part, for use within any evaluation. More detailed language with regard to such limitations and our Terms and Conditions may be found on our website at edm-net.com.

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	Max Search Radius (Feet)	Subject Property	From 0 - 500 feet	From 500.01 - 1000 feet	From 1000.01 - 2640 feet	Total # Found
FDEP DATABASES						
State NPL Equivalent(STNPL)	2640	0	0	0	0	**0**
State CERCLIS/SEMS Equivalent(STCERC)	500	0	0	N/A	N/A	**0**
Solid Waste Facilities List_Landfills(SLDWST_LF)	2640	0	0	2	0	**2**
Solid Waste Facilities List_Non-Landfills(SLDWST_NLF)	1000	0	0	2	N/A	**2**
Leaking Underground Storage Tanks List(LUST)	500	0	0	N/A	N/A	**0**
Underground/Aboveground Storage Tanks(TANKS)	500	0	0	N/A	N/A	**0**
State Designated Brownfields(BRWNFLDS)	500	0	0	N/A	N/A	**0**
Voluntary Cleanup List(VOLCLNUP)	500	0	0	N/A	N/A	**0**
Institutional and/or Engineering Controls(INSTENG)	500	0	0	N/A	N/A	**0**
Dry Cleaners List(DRY)	500	0	0	N/A	N/A	**0**

DRAFT

*** Disclaimer ***
Please understand that the regulatory databases we utilize were not originally intended for our use, but rather for the source agency's internal tracking of sites for which they have jurisdiction or other interest. As a result of this difference in intended use, their data is frequently found to be incomplete or inaccurate, and is less than ideal for our use. Our report is not to be relied upon for any purpose other than to "point" at approximate locations where further evaluation may be warranted. No conclusion can be based solely upon our report. Rather, our report should be used as a first step in directing your attention at potential problem areas, which should be followed up by site inspections, interviews with relevant personnel, regulatory file review and other means as specified in the ASTM Standard E 1527-13. Readers proceed at their own risk in relying upon this data, in whole or in part, for use within any evaluation. More detailed language with regard to such limitations and our Terms and Conditions may be found on our website at edm-net.com.

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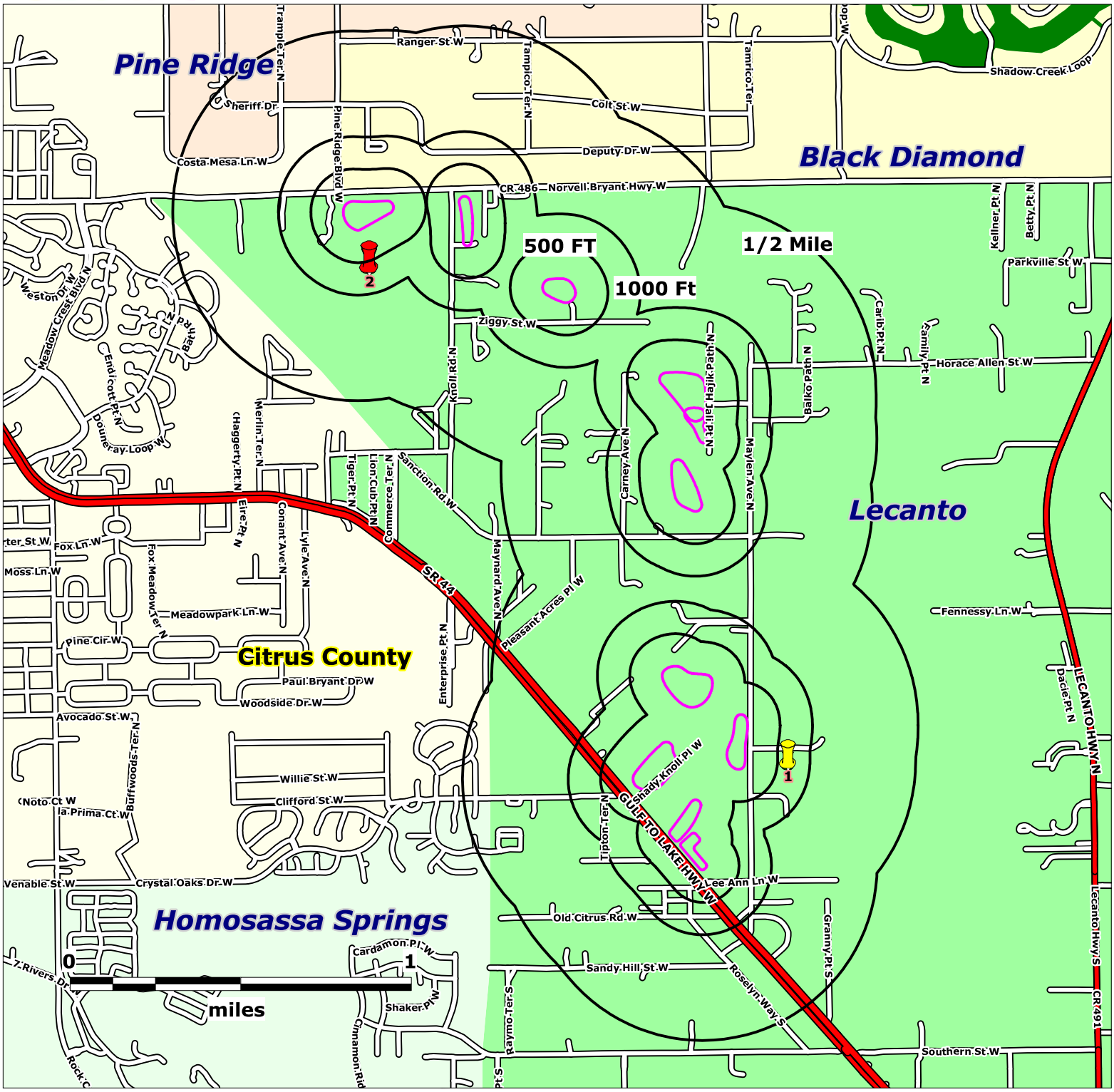
Custom Radius Research Report
Street Map



Source: US Census Bureau TIGER Files

Map Scale and Property Boundaries are Approximate

Approximate Site Boundary

NPL, STNPL, CERCLIS, SEMSACTV, SEMSARCH and SLDWST_LF sites - 1/2 Mile

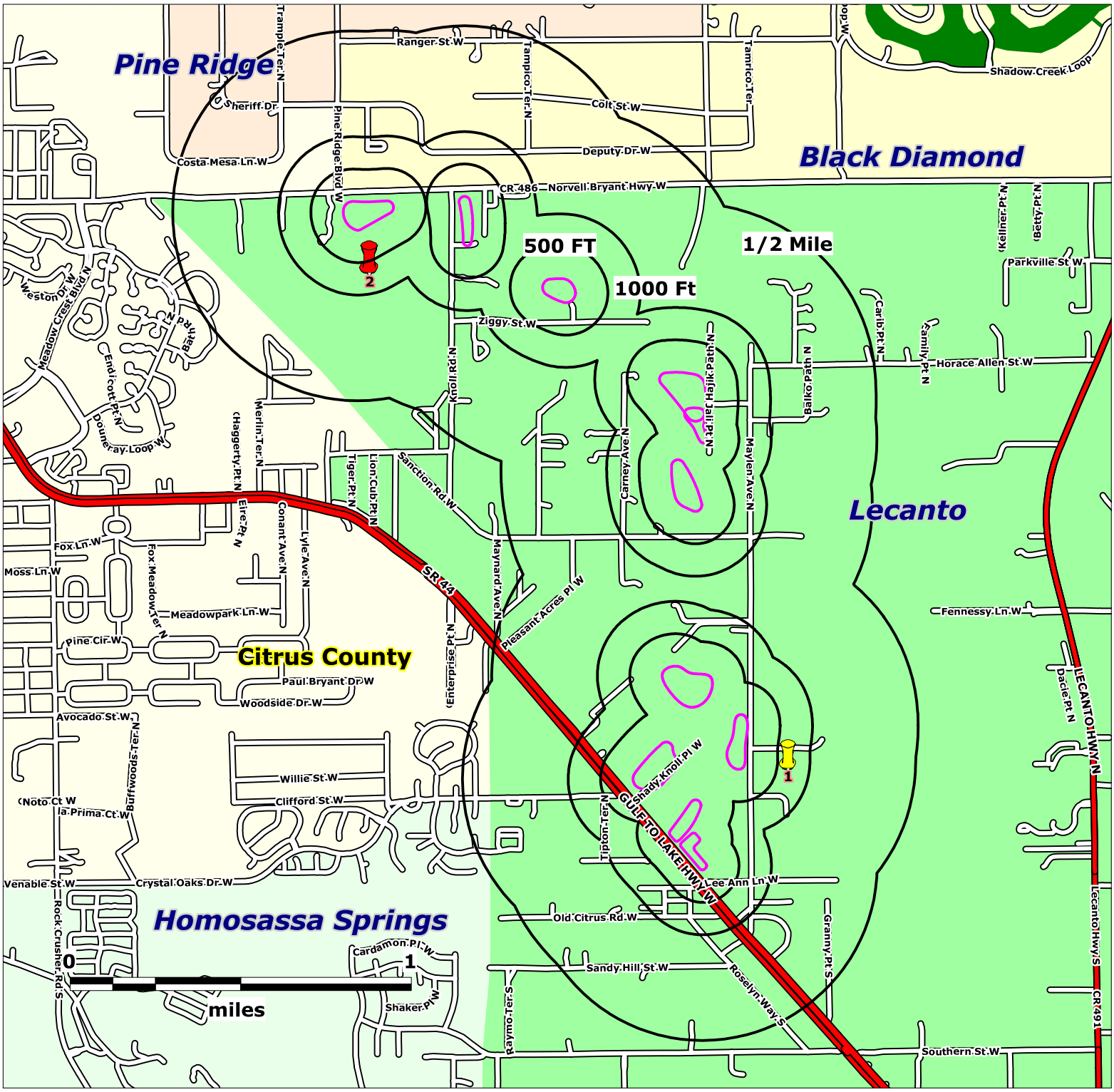
SLDWST_NLF sites - 1000 FT

NPLLIENS. CORRACTS, TSD, NFRAP, STCERC, LUST, BRWNFLDS, NONTSD VOLCLNUP, DRY, ERNS, TANKS & INSTENG sites - 500 Feet

Subject Property

Suncoast Parkway 2
from SR 44 to CR 486
Citrus County, Florida
EDM Job No: 25271
September 10, 2020

Custom Radius Research Report
Street Map



Source: US Census Bureau TIGER Files

Map Scale and Property Boundaries are Approximate

Subject Property

Suncoast Parkway 2
from SR 44 to CR 486
Citrus County, Florida
EDM Job No: 25271
September 10, 2020

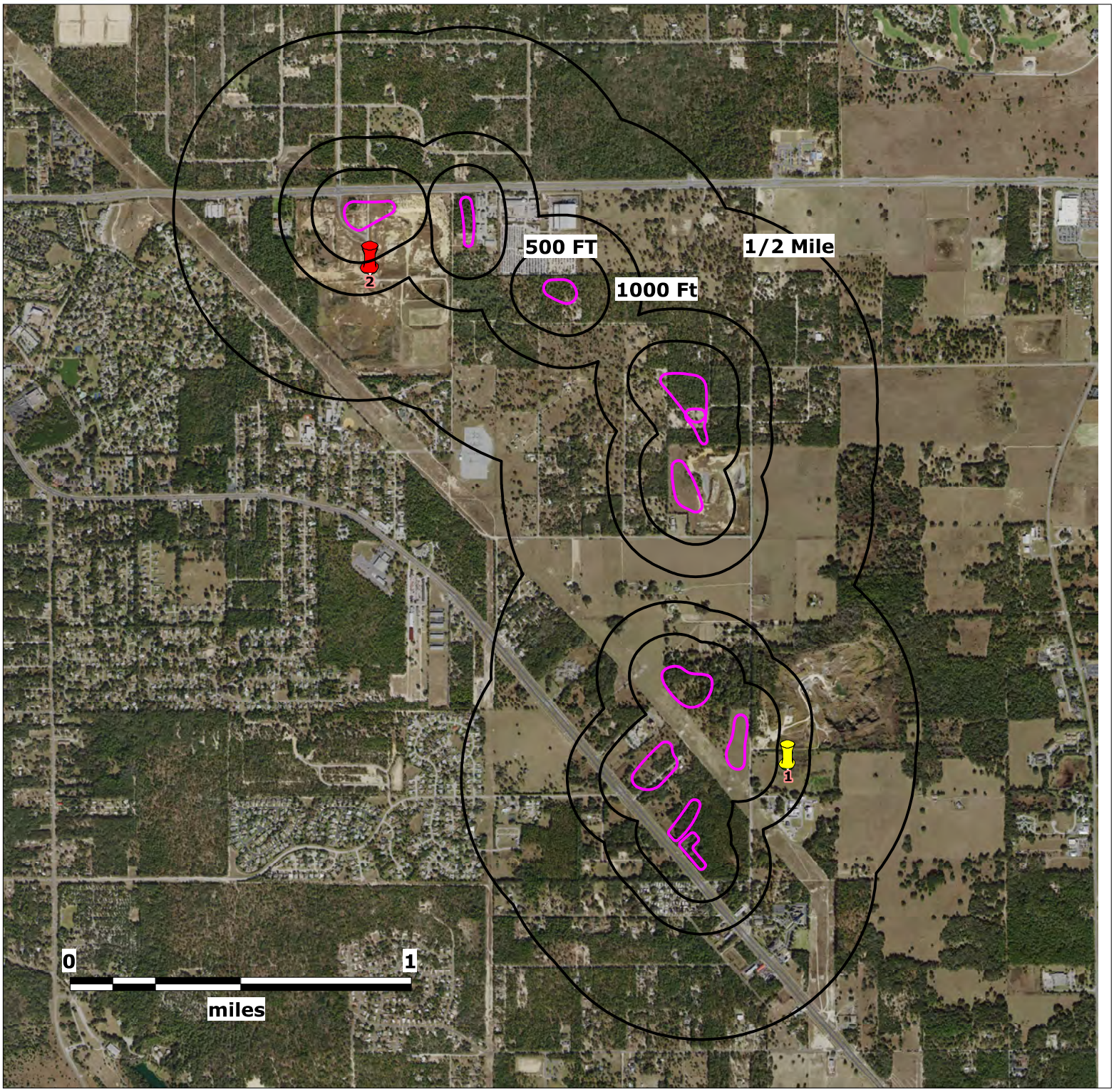
Approximate Site Boundary

NPL, STNPL, CERCLIS, SEMSACTV, SEMSARCH and SLDWST_LF sites - 1/2 Mile

SLDWST_NLF sites - 1000 FT

NPLLIENS. CORRACTS, TSD, NFRAP, STCERC, LUST, BRWNFLDS, NONTSD VOLCLNUP, DRY, ERNS, TANKS & INSTENG sites - 500 Feet

Custom Radius Research Report
2017 Aerial Photo



Source: Florida Department of Transportation

Map Scale and Property Boundaries are Approximate

Subject Property

Suncoast Parkway 2
from SR 44 to CR 486
Citrus County, Florida
EDM Job No: 25271
September 10, 2020

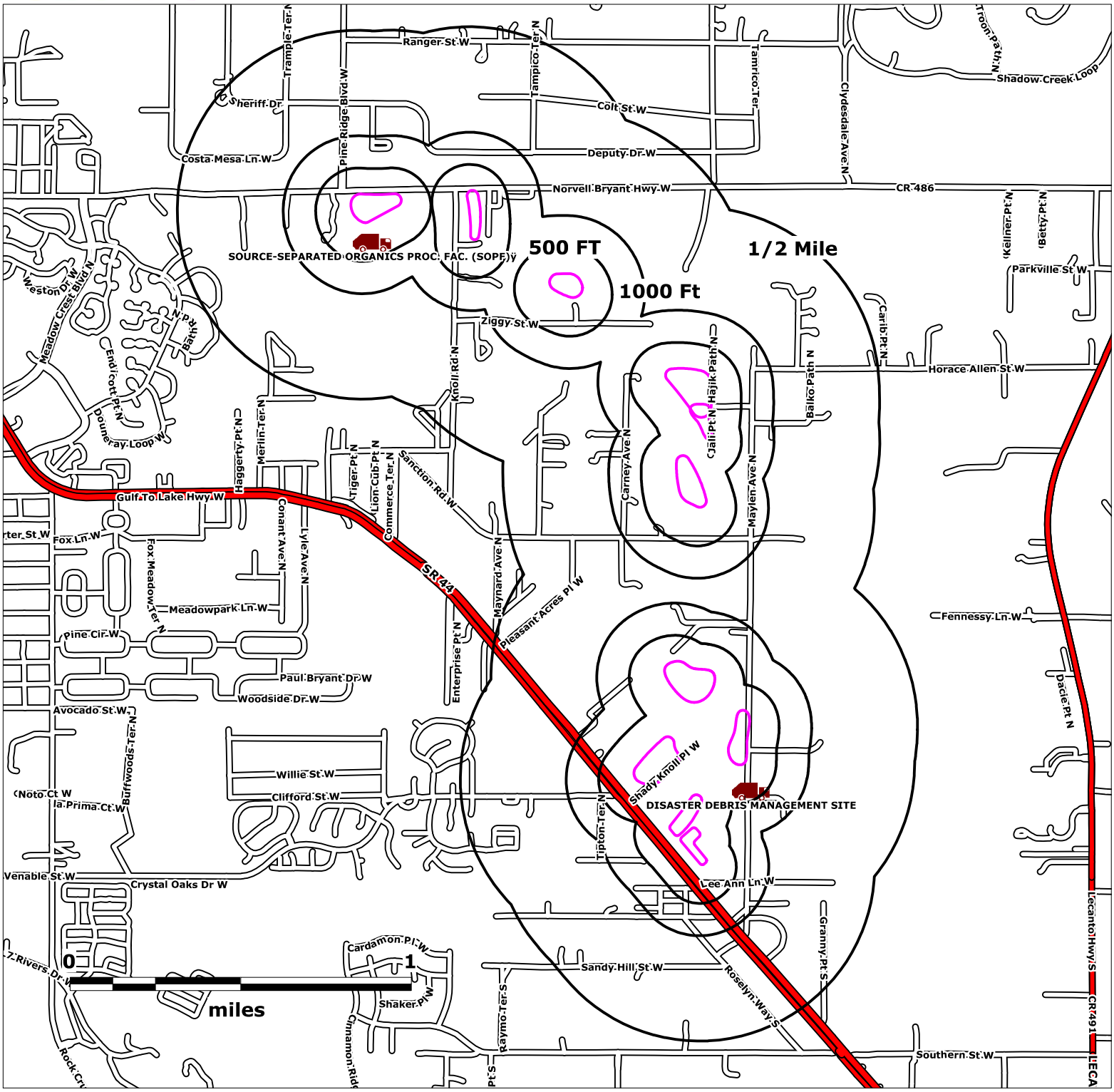
Approximate Site Boundary

NPL, STNPL, CERCLIS, SEMSACTV, SEMSARCH and SLDWST_LF sites - 1/2 Mile

SLDWST_NLF sites - 1000 FT

NPLLIENS. CORRACTS, TSD, NFRAP, STCERC, LUST, BRWNFLDS, NONTSD VOLCLNUP, DRY, ERNS, TANKS & INSTENG sites - 500 Feet

Custom Radius Research Report
Environmental Impact Areas Map



Source: FDEP and USEPA Geodata

Map Scale and Property Boundaries are Approximate

Subject Property

Suncoast Parkway 2
from SR 44 to CR 486
Citrus County, Florida
EDM Job No: 25271
September 10, 2020

- FDEP Brownfield Areas
- FDEP Brownfield Sites
- USEPA NPL & FDEP STNPL Sites
- FDEP Delineated GW Contamination
- Formerly Used Defense Sites FUDS
- FUDS Munitions Response Areas
- FDEP Cattle Dipping Vat
- FDEP Solid Waste Sites
- Institutional Controls
- Approximate Site Boundary

ENVIRONMENTAL DATA MANAGEMENT

Custom Radius Research

Site Summary Table

MapID Prgm List	Fac ID No	Site Dist (ft)	Site Dir	Site Elev (ft)	Site Name	Site Address
1						
SLDWST_NLF	102676	685		86.10	MAYLEN AVENUE	261 N MAYLEN AVENUE LECANTO, FL 34460
2						
SLDWST_LF	40147	772		73.25	486 SAND PIT INC (C	SR486,1.5MI E SR44 (30-18S-18E) CRYSTAL RIVER, FL 34429
SLDWST_LF	40459	772		73.25	CITRUS SAND & DEBRIS I	1590 N QUARTERBACK TERRACE CRYSTAL RIVER, FL 34429
SLDWST_NLF	40459	772		73.25	CITRUS SAND & DEBRIS I	1590 N QUARTERBACK TERRACE CRYSTAL RIVER, FL 34429

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FDEP SOLID WASTE FACILITIES LIST
NON-LANDFILL SITES

(SLDWST_NLF)

FACILITY ID, NAME AND LOCATION:

102676
MAYLEN AVENUE
261 N MAYLEN AVENUE
LECANTO , FL 34460

DISTRICT SWD
COUNTY CITRUS
SEC/TWN/RN //
AGENCY LAT: 28:51:59.7065
AGENCY LON: 82:30:16.5219

MAP ID NUMBER: 1
Dist (FEET): 685
Direction:

SLDWST

RESP AUTHORITY: ,

SITE CONTACT: ,

LAND OWNER: ,

FACILITY CLASS: 910/DISASTER DEBRIS MANAGEMENT SITE
CLASS STATUS: PRE-AUTHORIZED (B)

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FDEP INFORMATION PORTAL ON LINE REPORTS **(May Not Be Available For All Records)**

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FDEP SOLID WASTE FACILITIES LIST
LANDFILL SITES

(SLDWST_LF)

FACILITY ID, NAME AND LOCATION:

40147 **--HISTORICAL ENTRY--**
486 SAND PIT INC (C
SR486,1.5MI E SR44 (30-18S-18E)
CRYSTAL RIVER, FL 34429

DISTRICT
COUNTY CITRUS
SEC/TWN/RN 30-18S-18E
AGENCY LAT:
AGENCY LON:

MAP ID NUMBER: 2
Dist (FEET): 772
Direction:

SLDWST

RESP AUTHORITY:
THE 486 SAND PIT INC
1590 N QUARTERBACK TERRACE
CRYSTAL RIVER, FL 32629

SITE CONTACT:
,

LAND OWNER:
,

FACILITY CLASS: 540/CONSTRUCTION/DEMOLITION DEBRIS
CLASS STATUS: CLOSED, WITH GW MONITORING

FDEP INFORMATION PORTAL ON LINE DOCUMENTS **(May Not Be Available For All Records)**

FDEP INFORMATION PORTAL ON LINE REPORTS **(May Not Be Available For All Records)**

FACILITY ID, NAME AND LOCATION:

40459
CITRUS SAND & DEBRIS I
1590 N QUARTERBACK TERRACE
CRYSTAL RIVER , FL 34429

DISTRICT SWD
COUNTY CITRUS
SEC/TWN/RN 30 /18S /18E
AGENCY LAT: 28:53:11.75
AGENCY LON: 82:31:16.21

MAP ID NUMBER: 2
Dist (FEET): 772
Direction:

SLDWST

RESP AUTHORITY:
CITRUS SAND & DEBRIS, INC
450 PLEASANT GROVE ROAD
INVERNESS , FL 34452
3527467713

SITE CONTACT:
TOM PERCIVAL
,
4072643013

LAND OWNER:
,

FACILITY CLASS: 540/CONSTRUCTION/DEMOLITION DEBRIS DISPOSAL
CLASS STATUS: ACTIVE (A)

FDEP INFORMATION PORTAL ON LINE DOCUMENTS **(May Not Be Available For All Records)**

FDEP INFORMATION PORTAL ON LINE REPORTS **(May Not Be Available For All Records)**

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FDEP SOLID WASTE FACILITIES LIST
NON-LANDFILL SITES

(SLDWST_NLF)

FACILITY ID, NAME AND LOCATION:

40459
CITRUS SAND & DEBRIS I
1590 N QUARTERBACK TERRACE
CRYSTAL RIVER , FL 34429

DISTRICT SWD
COUNTY CITRUS
SEC/TWN/RN 30 /18S /18E
AGENCY LAT: 28:53:11.75
AGENCY LON: 82:31:16.21

MAP ID NUMBER: 2
Dist (FEET): 772
Direction:

SLDWST

RESP AUTHORITY:
CITRUS SAND & DEBRIS, INC
450 PLEASANT GROVE ROAD
INVERNESS , FL 34452
3527467713

SITE CONTACT:
TOM PERCIVAL
,
4072643013

LAND OWNER:
,

FACILITY CLASS: 330/SOURCE-SEPARATED ORGANICS PROC. FAC. (SOPF)
CLASS STATUS: CLOSED, NO GW MONITORING (J)

FDEP INFORMATION PORTAL ON LINE DOCUMENTS **(May Not Be Available For All Records)**

FDEP INFORMATION PORTAL ON LINE REPORTS **(May Not Be Available For All Records)** p?wacc=404

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ENVIRONMENTAL DATA MANAGEMENT

Custom Radius Research

Proximal Site Summary Table

This table includes mapped sites whose plotted coordinates fall just outside of the ASTM or client defined research distance but whose property boundaries may still extend into the search area. These sites are typically large commercial or industrial tracts that may merit inclusion in the evaluation process. Detail data reports on any of these sites may be requested and will be sent as an addendum to this report at no additional cost.

Report Date: 9/10/2020

MapID Prgm List	Fac ID No	Site Dist (ft)	Site Dir	Site Elev (ft)	Site Name	Site Address
1A						
TANKS	8627070	1015		44.74	AUTO PROS	4320 W GULF TO LAKE HWY LECANTO, FL 32661
TANKS	8627070.	1015		44.74	AUTO PROS	43020 W GULF - LAKE HWY LECANTO, FL 32661
2A						
ERNS	452930	1033		99.25	FLORIDA GAS TRANSMISION	245 N MAYLEN AVE LACANTO, FL
ERNS	452954	1033		99.25	FLORIDA GAS TRANSMISION	251 NORTH MAYLEN AVE LECANTO, FL
NONTSD	FL0000935619	1033		99.25	FLORIDA GAS TRANSMISSION C - S 26	245 N MAYLEN AVE LECANTO, FL 344618938
TANKS	9804744	1033		99.25	FL GAS COMPRESSOR STAT #26	245 N MAYLEN AVE LECANTO, FL 34461
3A						
TANKS	9804940	1195		72.52	CRYSTAL RIVER QUARRIES INC-MAYLEN MINE	287 MAYLEN AVE LECANTO, FL 34461
4A						
TANKS	9813391	1403		92.21	SUPERIOR RESIDENCES OF LECANTO	4865 W GULF TO LAKE HWY LECANTO, FL 34461
5A						
TANKS	9300729	772		73.25	CITRUS SAND & DEBRIS INC	1590 N QUARTERBACK TERR CRYSTAL RIVER, FL 34428
6A						
LUST	9600578	777		71.64	DAMRON AUTO SALVAGE	4950 NORVELL BRYANT HWY CRYSTAL RIVER, FL 34429
NONTSD	FLD982105694	777		71.64	LKQ OF CRYSTAL RIVER	4950 W NORVELL BRYANT HWY CRYSTAL RIVER, FL 344295731
TANKS	9600578	777		71.64	DAMRON AUTO SALVAGE	4950 NORVELL BRYANT HWY CRYSTAL RIVER, FL 34429
VOLCLNUP	294824	777		71.64	LKQ -CRYSTAL RIVER	4950 W. NORVELL BRYANT HWY CRYSTAL RIVER, FL 34429

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ENVIRONMENTAL DATA MANAGEMENT

Custom Radius Research

Non-Mapped Records Summary Table

This table is a listing of database records that have not been plotted within our mapping system. Detail data reports on any of these sites may be requested and will be sent as an addendum to this report at no additional cost.

Report Date: 9/10/2020

Prgm List Fac ID No	Site Name	Site Address
ERNS		
64228		HWY 44 BEHIND SUNCOAST SIGNS / 2MI FROM CRYSTAL RIVER , FL
TANKS		
8944441	SUNSHINE JR #440	SR 44 CRYSTAL RIVER, FL

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Agency List Descriptions

USEPA and State Databases are updated on a quarterly basis. Supplemental Databases are updated on an annual basis.

Florida Department of Environmental Protection (FDEP)

State Designated Brownfields(BRWNFLDS)

The FDEP Brownfields database contains a listing of State Designated Brownfield Areas and Brownfield Sites. Brownfields are typically defined as abandoned, idled or underused industrial and commercial sites where expansion or redevelopment is complicated by real or perceived environmental contamination.

Agency File Date: 4/16/2020 **Received by EDM:** 5/26/2020 **EDM Database Updated:** 5/26/2020

Dry Cleaners List(DRY)

The FDEP Dry Cleaning Facilities List is comprised of data from the FDEP Storage Tank and Contamination Monitoring (STCM) database and the Drycleaning Solvent Cleanup Program- Priority Ranking List. It contains a listing of those Dry Cleaning sites (and suspected historical Dry Cleaning sites) who have registered with the FDEP and/or have applied for the Dry Cleaning Solvent Cleanup Program.

Agency File Date: 5/29/2020 **Received by EDM:** 5/29/2020 **EDM Database Updated:** 5/29/2020

Institutional and/or Engineering Controls(INSTENG)

The FDEP Institutional Controls Registry Database (INSTENG) contains sites that have had Institutional and/or Engineering Controls implemented to regulate exposure to environmental hazards

Agency File Date: 5/27/2020 **Received by EDM:** 5/27/2020 **EDM Database Updated:** 5/27/2020

Leaking Underground Storage Tanks List(LUST)

The FDEP LUST list identifies facilities and/or locations that have notified the FDEP of a possible release of contaminants from petroleum storage systems. This Report is generated from the FDEP Storage Tank and Contamination Monitoring Database (STCM).

Agency File Date: 5/29/2020 **Received by EDM:** 5/29/2020 **EDM Database Updated:** 5/29/2020

Solid Waste Facilities List_Landfills(SLDWST_LF)

The SLDWST_LF list identifies locations that have conducted solid waste landfill activities as determined by the applicable FDEP Facility Classifications. Sites listed with "##" after the Facility ID Number are historical locations, obtained from documents on record at local agencies.

Agency File Date: 5/29/2020 **Received by EDM:** 5/29/2020 **EDM Database Updated:** 5/29/2020

Solid Waste Facilities List_Non-Landfills(SLDWST_NLF)

The SLDWST_NLF list identifies locations that have conducted solid waste handling activities other than landfilling, as determined by the applicable FDEP Facility Classifications, such as Transfer Stations, Disaster Debris Staging Areas and sites handling Bio-Hazardous wastes. Sites listed with "##" after the Facility ID Number are historical locations, obtained from documents on record at local agencies.

Agency File Date: 5/29/2020 **Received by EDM:** 5/29/2020 **EDM Database Updated:** 5/29/2020

State CERCLIS/SEMS Equivalent(STCERC)

The STCERC list is compiled from the FDEP Site Investigation Section list, the Florida SITES list(historical) and the FDEP Cleanup Sites list. These sites are being assessed and/or cleaned up as a result of identified or suspected contamination from the release of hazardous substances. The FDEP Cleanup Sites list programs include: Brownfields, Petroleum, EPA Superfund (CERCLA), Drycleaning, Responsible Party Cleanup, State Funded Cleanup, State Owned Lands Cleanup and Hazardous Waste Cleanup.

Agency File Date: 1/11/2020 **Received by EDM:** 4/15/2020 **EDM Database Updated:** 4/15/2020

State NPL Equivalent(STNPL)

The FDEP State Funded Cleanup list contains facilities and/or locations where there are no viable responsible parties; the site poses an imminent hazard; and the site does not qualify for Superfund or is a low priority for EPA. Remedial efforts at these sites are currently being addressed through State funded cleanup action.

Agency File Date: 8/3/2020 **Received by EDM:** 8/3/2020 **EDM Database Updated:** 8/3/2020

Underground/Aboveground Storage Tanks(TANKS)

The FDEP TANKS list contains sites with registered aboveground and underground storage tanks containing regulated petroleum products.

Agency File Date: 7/16/2020 **Received by EDM:** 7/16/2020 **EDM Database Updated:** 7/20/2020

Voluntary Cleanup List(VOLCLNUP)

The VOLCLNUP List is derived from the FDEP Brownfields Site Rehabilitation Agreement (BSRA) database and the FDEP Office of Waste Cleanup Responsible Party Sites database. This list identifies those sites that have signed an agreement to Voluntarily cleanup a site and/or sites where legal responsibility for site rehabilitation exists pursuant to Florida Statutes and is being conducted either voluntarily or pursuant to enforcement activity.

Agency File Date: 6/1/2020 **Received by EDM:** 6/1/2020 **EDM Database Updated:** 6/1/2020

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United States Environmental Protection Agency (EPA)

Comp Env Resp, Compensation & Liability Info Sys List(CERCLIS)

The US EPA Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database tracks potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are proposed to be on the NPL, are on the NPL and sites that are in the screening and assessment phase for possible inclusion on the NPL. The CERCLIS database was retired in November of 2013 and has been replaced by the Superfund Enterprise Management System (SEMS).

Agency File Date: 11/12/2013 **Received by EDM:** 2/18/2016 **EDM Database Updated:** 2/18/2016

RCRIS Handlers with Corrective Action(CORRACTS)

The US EPA Corrective Action Sites (CORRACTS) database is a listing of hazardous waste handlers that have undergone RCRA corrective action activity.

Agency File Date: 3/9/2020 **Received by EDM:** 3/10/2020 **EDM Database Updated:** 3/11/2020

Emergency Response Notification System List(ERNS)

The Emergency Response Notification System (ERNS) database stores information on oil discharges and hazardous substance releases. The ERNS program is a cooperative data sharing effort among the EPA, DOT and the National Response Center (NRC), which currently provides access to this data.

Agency File Date: 12/31/2019 **Received by EDM:** 2/21/2020 **EDM Database Updated:** 2/24/2020

Archived Cerclis Sites(NFRAP)

The US EPA NFRAP list contains archived data of CERCLIS records where the EPA has completed assessment activities and determined that no further steps to list the site on the NPL will be taken. NFRAP sites may be reviewed in the future to determine if they should be returned to CERCLIS based upon newly identified contamination problems at the site. The NFRAP database was retired in November of 2013 and has been replaced by the Superfund Enterprise Management System (SEMS) .

Agency File Date: 10/25/2013 **Received by EDM:** 2/18/2016 **EDM Database Updated:** 2/18/2016

RCRA-LQG,SQG,CESQG and Transporters(NONTSD)

The EDM NONTSD list is a subset of the US EPA RCRAInfo System and identifies facilities that generate and transport hazardous wastes. These facilities may be Large Quantity Generators (LQG), Small Quantity Generators (SQG), Conditionally Exempt SQG's (CESQG) as well as" Non-Notifiers" and "Non-Handlers".

Agency File Date: 6/1/2020 **Received by EDM:** 6/1/2020 **EDM Database Updated:** 6/1/2020

National Priorities List(NPL)

The US EPA National Priorities List (NPL) contains facilities and/or locations where environmental contamination has been confirmed and prioritized for cleanup activities under the Superfund Program. EDM's NPL Report includes sites that are currently on the NPL as well as sites that have been Proposed, Withdrawn and/or Deleted from the list. Previously, information for the NPL was managed under the CERLIS data management system. In 2014 this system was replaced with the Superfund Enterprise Management System (SEMS). EPA last updated CERCLIS in November of 2013. EDM's NPL Report contains available SEMS data and the archived CERCLIS data relative to NPL sites.

Agency File Date: 4/15/2020 **Received by EDM:** 5/26/2020 **EDM Database Updated:** 5/26/2020

NPL Liens List(NPLLIENS)

The US EPA NPL Liens List identifies those sites where under authority granted by CERCLA, liens have been filed against real property in order to recover expenditures from remedial action or when the property owner receives a notice of potential liability.

Agency File Date: 5/22/2020 **Received by EDM:** 6/1/2020 **EDM Database Updated:** 6/1/2020

SEMS Active Site Inventory List(SEMSACTV)

The US EPA Superfund Enterprise Management System (SEMS) tracks potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. The SEMSACTV list contains sites that are on the National Priorities List (NPL) as well as sites that are prosposed for or in the screening and assessment phase for possible inclusion on the NPL. SEMS has replaced the CERCLIS database, which was retired in November of 2013.

Agency File Date: 5/22/2020 **Received by EDM:** 6/1/2020 **EDM Database Updated:** 6/1/2020

SEMS Archived Site Inventory List(SEMSARCH)

The US EPA Superfund Enterprise Management System (SEMS), contains archived data of CERCLIS or SEMS records where the EPA has completed assessment activities and determined that no further steps to list the site on the NPL will be taken. These sites may be reviewed in the future to determine if they should be returned to SEMS based upon newly identified contamination problems at the site. SEMS has replaced the CERCLIS database, which was retired in November of 2013. The SEMSARCH database contains these newly archived records under the SEMS database management system.

Agency File Date: 5/22/2020 **Received by EDM:** 6/1/2020 **EDM Database Updated:** 6/1/2020

Tribal Lust List(TRIBLLUST)

EDM's Tribal LUST list is derived from the USEPA Region IV Tribal Tanks database by extracting those sites with indicators of past and/or current releases.

Agency File Date: 2/24/2010 **Received by EDM:** 3/9/2010 **EDM Database Updated:** 3/9/2010

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Tribal Tanks List(TRIBLTANKS)

The USEPA Region IV Tribal Tanks database lists Active and Closed storage tank facilities on Native American lands.

Agency File Date: 2/24/2010 **Received by EDM:** 3/9/2010 **EDM Database Updated:** 3/9/2010

RCRA-Treatment, Storage and/or Disposal Sites(TSD)

The EDM TSD list is a subset of the US EPA RCRAInfo system and identifies facilities that Treat, Store and/or Dispose of hazardous waste.

Agency File Date: 6/1/2020 **Received by EDM:** 6/1/2020 **EDM Database Updated:** 6/1/2020

Brownfields Management System(USBRWNFLDS)

The US EPA Brownfields program provides information on environmentally distressed properties that have received Grants or Targeted funding for cleanup and redevelopment . Tribal Brownfield sites are included in the USBRWNFLDS database.

Agency File Date: 6/1/2020 **Received by EDM:** 6/1/2020 **EDM Database Updated:** 6/1/2020

Institutional and/or Engineering Controls(USINSTENG)

The USINSTENG list is compiled from data elements contained in the NPL, CORRACTS, USBRWNFLDS and RCRAInfo databases.

Agency File Date: 6/1/2020 **Received by EDM:** 6/1/2020 **EDM Database Updated:** 6/3/2020

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Environmental Impact Areas

Brownfield Areas and Sites

The FDEP Brownfields database contains a listing of State Designated Brownfield Areas and Brownfield Sites. Brownfields are typically defined as abandoned, idled or underused industrial and commercial sites where expansion or redevelopment is complicated by real or perceived environmental contamination.

Agency File Date: 4/16/2020 **Received by EDM:** 5/26/2020 **EDM Database Updated:** 5/26/2020

https://floridadep.gov/waste/waste-cleanup/content/brownfields-program

Cattle Dipping Vats

From the 1910's through the 1950's, vats were filled with an arsenic solution for the control and eradication of the cattle fever tick. Other pesticides such as DDT where also widely used. By State law, all cattle, horses, mules, goats, and other susceptible animals were required to be dipped every 14 days. Under certain circumstances, the arsenic and other pesticides remaining at the site may present an environmental or public health hazard.

Some of the sites have been located and are currently under investigation. However, most of the listings are from old records of the State Livestock Board, which listed each vat as it was put into operation. In addition, some privately operated vats may have existed which were not listed by the Livestock Board. EDM's Cattle Dipping Vat sites are retrieved from the Voluntary Cleanup and STCERC datablases. For additional information on Cattle Dipping Vats visit the FDEP and FDOH websites at:

Agency File Date: 10/31/2018 **Received by EDM:** 1/25/2019 **EDM Database Updated:** 1/25/2019

https://floridadep.gov/waste/district-business-support/content/cattle-dipping-vats-cdv

http://www.floridahealth.gov/environmental-health/drinking-water/cattledipvathome.html

Formerly Used Defense Sites

The DoD is responsible for the environmental restoration of properties that were formerly owned by, leased to or otherwise possessed by the United States and operated under the jurisdiction of the Secretary of Defense prior to October 1986. Such properties are known as Formerly Used Defense Sites (FUDS). The Army is the executive agent for the program and the U.S. Army Corps of Engineers manages and directs the program's administration. For more information on the FUDS Program, including maps and data on individual sites, visit the Army Corps of Engineers website at:

Agency File Date: 5/29/2018 **Received by EDM:** 1/25/2019 **EDM Database Updated:** 1/25/2019

http://www.usace.army.mil/Missions/Environmental/Formerly-Used-Defense-Sites/

FUDS Munitions Response Sites

The DoD developed the Military Munitions Response Program (MMRP) in 2001 to addresses munitions-related concerns, including explosive safety, environmental, and health hazards from releases of unexploded ordnance (UXO), discarded military munitions (DDM), and munitions constituents (MC) found at locations, other than operational ranges, on active and Base Realignment and Closure (BRAC) installations and Formerly Used Defense Sites (FUDS) properties. The MMRP addresses non-operational range lands with suspected or known hazards from munitions and explosives of concern (MEC) which occurred prior to September 2002, but are not already included with an Installation Response Program (IRP) site cleanup activity. For more information on the FUDS MMRP Program, including maps and data on individual sites, visit the Army Corps of Engineers website at:

Agency File Date: 5/14/2018 **Received by EDM:** 1/25/2019 **EDM Database Updated:** 1/25/2019

http://www.asaie.army.mil/Public/ESOH/mmrp.html

Groundwater Contamination Areas

The Ground Water Contamination Areas GIS layer is a statewide map showing the boundaries of delineated areas of known groundwater contamination pursuant to Chapter 62-524, F.A.C., New Potable Water Well Permitting In Delineated Areas. 38 Florida counties have been delineated primarily for the agricultural pesticide ethylene dibromide (EDB), and to a much lesser extent, volatile organic and petroleum contaminants. This GIS layer represents approximately 427,897 acres in 38 counties in Florida that have been delineated for groundwater contamination. However, it does not represent all known sources of groundwater contamination for the state of Florida.

This information is intended to be used by regulatory agencies issuing potable water well construction permits in areas of ground water contamination to protect public health and the ground water resource. Permitted water wells in these areas must meet specific well construction criteria and water testing prior to well use. This dataset only indicates the presence or absence of specific groundwater contaminants and does not represent all known sources of groundwater contamination in the state of Florida.

Agency File Date: 11/28/2018 **Received by EDM:** 1/24/2019 **EDM Database Updated:** 1/24/2019

https://floridadep.gov/water/source-drinking-water/content/delineated-areas

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Institutional Controls

The FDEP Institutional Controls GIS layer is a statewide map showing the approximate boundaries of delineated areas where Institutional Controls are in place.

An institutional control provides for certain restrictions on a property. For example, a site may be cleaned up to satisfy commercial contamination target levels and an institutional control may be placed on that property indicating that it may only be used for commercial activities. If the owner of the property ever wanted to use that property for residential purposes, the owner would have to ensure that any contamination meets residential target levels.

The locational data for this layer is provided by the responsible party and reviewed by FDEP staff. Neither FDEP or EDM assumes respondibility for the accuracy of the boundary data.

Agency File Date: 5/27/2020 **Received by EDM:** 5/27/2020 **EDM Database Updated:** 5/27/2020

https://ca.dep.state.fl.us/mapdirect/?webmap=cff8d21797184421ab4763d3e4a01e48

National Priorities List

The US EPA National Priorities List (NPL) contains facilities and/or locations where environmental contamination has been confirmed and prioritized for cleanup activities under the Superfund Program. EDM's NPL site boundaries data include sites that are currently on the NPL as well as sites that have been Proposed, Withdrawn and/or Deleted from the list.

Agency File Date: 11/14/2018 **Received by EDM:** 12/10/2018 **EDM Database Updated:** 1/22/2019

https://www.epa.gov/superfund/search-superfund-sites-where-you-live

Solid Waste Facilities

The FDEP SLDWST list identifies locations that have been permitted to conduct solid waste handling activities.

Agency File Date: 1/23/2019 **Received by EDM:** 1/24/2019 **EDM Database Updated:** 1/25/2019

https://floridadep.gov/waste

State Funded Cleanup Sites

The FDEP State Funded Cleanup list contains facilities and/or locations where there are no viable responsible parties; the site poses an imminent hazard; and the site does not qualify for Superfund or is a low priority for EPA. Remedial efforts at these sites are currently being addressed through State funded cleanup action.

Agency File Date: 8/10/2019 **Received by EDM:** 8/12/2019 **EDM Database Updated:** 8/12/2019

https://floridadep.gov/waste/waste-cleanup/documents/state-funded-cleanup-program-site-list

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CSER APPENDIX E

Site Photographs

DRAFT

Pond Site Photography

Pond 2-5, Alternative 1 – central portion of the pond site looking north

Pond 2-5, Alternative 2 – central portion of the pond site looking south

Pond 2-5, Alternative 3 – southwest area of the pond site looking northeast

Pond 2-5, Alternative 4 – Central area looking south

Pond 2-6, Alternative 1 – north-central area looking south

Pond 2-6, Alternative 2 – northern area looking west

Pond 2-6, Alternative 3 – construction site located in eastern area

Pond 2-6, Alternative 3 – northeast area looking west

Pond 2-7, Alternative 1 – central portion looking west

Pond 2-7, Alternative 1 – two empty 55-gallon drums and metal shelves located in the central area of the pond site

Pond 2-7, Alternative 2 (north portion) – central area looking east

Pond 2-7, Alternative 3 – central area looking west

DRA-E – offsite looking north toward west portion of pond site.

DRA-E – southeastern portion of the pond site looking north

CSER APPENDIX F

Supplemental Information

DRAFT

2009 PD&E Excerpts

DRAFT

TECHNICAL MEMORANDUM
Environmental Screening

Suncoast Parkway 2
Hernando & Citrus Counties, Florida

Florida's Turnpike Enterprise

Financial Project ID Number: 405270-1-32-03
Federal Aid Project Number: N/A

This project consists of new alignment expansion from US 98 in Hernando County to US 19 in Citrus County a distance of approximately 26 miles

Prepared for:
Dyer, Riddle, Mills & Precourt, Inc. (DRMP)

Prepared by:
Tierra, Inc
7805 Professional Place
Tampa, Florida
Tierra, Inc Project Number 6511-07-070A

June 2009

DRAFT

EXECUTIVE SUMMARY

This environmental screening technical memorandum has been prepared as part of the Project Development & Environment (PD&E) re-evaluation document submittals for the proposed roadway extension project. The purpose of this environmental screening report is to evaluate potential impacts from contaminated sites to the project. The environmental screening covers the proposed main-line corridor and an area extending 300 feet beyond the proposed right-of-way (ROW). Stormwater management sites were evaluated as part of the contamination screening process. The results of the stormwater management sites screening for each design section are presented in Appendix I of this report.

In accordance with the FDOT policy and the Federal Highway Administration (FHWA) requirements, a contamination screening technical memorandum has been prepared to evaluate potential impacts from contaminated sites to the project. The report has been prepared pursuant to the FHWA's *Technical Advisory T 6640.8A,* FDOT's *PD&E Manual, Part 2, Chapter 22,* and standard environmental assessment practices including reviewing records of regulatory agencies, site reconnaissance, literature review, and personal interviews of individuals and business owners within the limits of the project.

A total of 29 sites with potential for environmental impact were identified along the proposed corridor. The environmental screening evaluation has resulted in the following risk rankings for potential contamination sites. One (1) "High" risk ranking site, eight (8) "Medium" ranking sites, fifteen (15) "Low" ranking sites, and five (5) sites ranked "No" for potential contamination. The site name, potential risk, and map identification are presented in Table 1 below.

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Table 1 – Potential Contamination Sites

MAP / SITE ID	PROPERTY/ BUSINESS NAME	CONTAMINATION CONCERN	RISK RANKING	PREVIOUS RISK RANKING (1)
24	Etna Turpentine Camp	Petroleum distillates - Turpentine, and Resins	MEDIUM	NA
1	Closed Chicken Farm	Petroleum products, Chicken manure sludge	MEDIUM	MEDIUM
25	Illegal dump site	solid waste, waste oils	HIGH	NA
4	C&D Landfill	Leachate	LOW	MEDIUM
26	RIP C&D and Sand Mine	Leachate	LOW	NA
27	Sand Mine	solid waste	NO	NA
28	FPC Sub Station	PCBs	LOW	NA
12	Lecanto Hills Mobile Home Park	Domestic WWTP, fecal Chlorine	LOW	LOW
29	Florida Gas Transmission Line Compressor Station 26	Dimethyldisulfide, lubricating oil, Tert-Butyl-Alcohol, Natural Gas	LOW	NA
30	Crystal River Quarries, Inc.	Petroleum	LOW	NA
31	Maylen Property	solid waste, waste oils	MEDIUM	NA
23	Maylen Avenue Cattle Dip Vat	Cattle Dipping Vat	MEDIUM	HIGH
32	Allen Site RAF	Domestic waste	LOW	NA
33	Former Limerock mine	solid waste	NO	NA
15	Damrons Auto Salvage / LKQ	Petroleum products storage and use	LOW	MEDIUM
17	Citrus Sand & Debris, Inc.	Leachate & Solid Waste	LOW	MEDIUM
19	Pine Ridge Illegal dump site	solid waste, paints, oil, solvents	LOW	MEDIUM
34	Citrus County Charles Black II WTP / a.k.a. Meadow crest WTP	Chlorine - diesel fuel	LOW	NA
35	Citrus County Charles Black II WWTP / a.k.a. Meadow crest WWTP	Domestic WWTP	LOW	NA
36	Pig Farm / Residential facility	solid waste	MEDIUM	NA
37	Citrus County Utilities Crystal Acres MHP WWTP	Domestic WWTP , Fecal, Chlorine	NO	NA
20	Iguana Path illegal dump sites	solid waste,	LOW	MEDIUM
38	CSX Rail corridor	Arsenic, Creosote, Petroleum Products	MEDIUM	NA
39	Progress Energy Sub Station	Sulfuric Acid and P-Nitroaniline	LOW	NA
40	North Bull Townsend Point Illegal Dump Sites	solid waste, paints, oil, solvents	MEDIUM	NA
22	Basswood Avenue Illegal Dump Sites	solid waste, paints, oil, solvents	MEDIUM	MEDIUM
41	Crystal river Precast Plant	SQG	NO	NA
42	Shell former Texaco	Petroleum	NO	NA
21	Crystal River Quarries Inc.	Petroleum	LOW	LOW

Note: Map IDs less than 24 reflect the identification number from the 1998 SEIR

Note: The sites are listed in geographical orientation from south to to north and therefore DO NOT follow numerical order.

Designated for facilities/sites with a "No" risk ranking

Designated for facilities/sites with a "LOW" risk ranking

Designated for facilities/sites with a "MEDIUM or HIGH" risk ranking

(1) Previous risk rankings from the October, 1997 CSER prepared by H.W. Lochner, Inc.
Those sites noted as NA were not previously evaluated

NOTE: Sites 27, 28, and 29 are located outside the corridor mapping and therefore are not depicted on Figure 2

A total of 69 ponds, easements and named floodplain compensation areas are depicted on the Conceptual Design plans dated February 6, 2009, along the proposed corridor. The environmental screening evaluation has resulted in the following risk rankings for potential contamination at these sites. None (0) “High” risk ranking site, five (5) “Medium” ranking sites, twenty-seven (27) “Low” ranking sites, and thirty-seven (37) sites ranked "No" for potential contamination. Copies of the three Pond Screening Reports (PSRs), one report for each design section of this proposed corridor, are included in Appendix I.

Tierra recommends Level II field screening be conducted for all “Medium” and “High” ranked sites identified above in pink. A site-specific Level II scope of work should be prepared and submitted to the Florida’s Turnpike Enterprise (Turnpike) contamination impact coordinator or designated environmental manager for review and approval. Once the Level II scope of work is approved, field services should be completed and the results of the Level II screening included in the Final Environmental Screening Technical Memorandum for this project. Based on the results of the Level II field screening, site rankings may change for the final report.

This executive summary presents a brief overview of the environmental contamination reporting process and site identification information. The reader should utilize the detailed information presented within this report for specific information regarding any particular area of interest.

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Table 1 List of Facilities/Sites that have been identified, reviewed, and ranked for environmental risk.

MAP / SITE ID	DISTANCE/ DIRECTION FROM CORRIDOR DIRECTION	PROPERTY/ BUSINESS NAME	PROPERTY ADDRESS	PROPERTY OWNER	FACILITY TYPE	FACILITY ID NUMBER	PHOTOGRAPH NUMBER (s)	CONTAMINATION CONCERN	STORAGE TANKS	RISK DISCUSSION	CURRENT RISK RANKING	**PREVIOUS** RANKING
24	within corridor - Section 1	Etna Turpentine Camp	NA	State Forest	Historical use of Turpentine distillates	NA	1 , 2, 3, 4	Petroleum distillates - Turpentine, and Resins	NO	This facility is identified as a historical Turpintine Camp. The Etna Turpintine Camp was discovered during the installation of the natural gas pipeline which runs parallel to and east of the Progress Energy 500 kV transmission line. An archeological report was submitted for this site and is located at the Citrus County Historical Library in Inverness, Florida. During the site reconnaissance three montitoring wells were identified on the site. The camp repoertedly was used from the early 1900s up to approximately the late 1930's. No additional information was identified regarding the monitoring wells. According to the Material Safety Data Sheet (MSDS) for Turpintine it is harmful to the environment and aquatic organisms. Turpintine is obtained by distilling the gum from various species of pine. It is a mixture of isomeric terpene hydrocarbons. Turpintine is not soluble in water and has a relative density of 0.9 (water = 1). Based on the potential environmetal concerns from Turpintine effecting the soil and water this site is given a risk ranking of MEDIUM for potential contamination. A copy of the MSDS and portions of the Archeological Report are provided in Appendix H.	**MEDIUM**	**NA**
1	Less than 1/8 mile - Section 1	Closed Chicken Farm	Gordon Point Drive	Unknown	Petroleum/ waste water	NA	5 & 6	Petroleum products, Chicken manure sludge	NO	This facility was listed in the 1996 PD&E as having petroleum products in a barn located being the chicken coops and a mobile fuel tank on the back of a pickup truck. A manure sludge pond was identified to be to the north of the chicken coops. A recent site visit did not identify any petroleum equipment or storage tanks on site. However, the sludge lagoon was observed to be to the north of the chicken coops. This area should be further assessed to identify any potential contaminants within the sludge lagoon area. This site is given a risk ranking of MEDIUM for potential contamination.	**MEDIUM**	**MEDIUM**
25	within corridor - Section 1	Illegal dump site	200 ft north of west Whippoorwill St under transmission lines	Progress Energy Corp.	Solid Waste	NA	7 & 8	solid waste, waste oils	NO	Illicit dumping observed with several 5-gal buckets of used oil and other plastic, metal, and furniture debris. Some of the waste oil has spilled onto the soil and staining is apparent. Based on the visual evidence of a minor release of waste oil on the surface soils this site is given a risk ranking of HIGH for potential impact to the project corridor.	**HIGH**	**NA**
4	Approximately 1/4 mile east Section 1	C&D Landfill	3890 West Grover Cleveland Blvd., Homosassa, Fl 34461	Citrus Sand & Debris II	Solid Waste C&D	S102013682	9 & 10	Leachate	NO	This facility is located approximately 600 feet north east from the closest point on the corridor to the landfill southwest property corner. The current active C&D landfill is approximately 2500 feet north east. FDEP conducted a site inspection at this facility on May 15, 2007. No violations were reported. Based on the current regulatory status of this facility and the relative distance from the project corridor this facility is given a risk ranking of LOW for potential contamination.	**LOW**	**MEDIUM**
26	Approximately 1/2 mile west - Section 2	RIP C&D and Sand Mine	5335 Grover Cleveland Blvd., Homosassa, Florida	R.I.P Inc.	Solid Waste	21211-006-SO	11 & 12	Leachate	NO	This facility is located approximately 2800 feet south west from the closest point on the corridor. The R.I.P. facility includes a closed Class I landfill, an open Class II C&D land fill, and an open sand mine. The FDEP conducted a routine inspection on 8-10-07. Several items were checked as "Not OK" on the inspectors checklist. The narrative to this inspection indicated the areas of concern were related to overgrowth on the slopes of the landfill, trees and vegetation growing within the final cover, and stormwater erosion. Based on the regulatory status and the relative distance from the project corridor the landfill is given a risk ranking of LOW for potential contamination.	**LOW**	**NA**
27	Approximately 1/4 mile west - Section 2	Sand Mine	West Hoskins Lane, Homosassa, Florida	Unknown	Mining	NA	13 & 14	solid waste	NO	This facility was identified during the site reconnaissance. Located west of the Progress Energy transmission line a large soil berm prevents any observation of the facility. Once over the berm a large sand mine and vegetation mulching operation was observed. There are no FDEP files available for this facility and no environmental concerns identified during the site visit. Based on the lack of regulatory information and the observations made during the site visit this facility is given a risk ranking of NO for potential contamination.	**NO**	**NA**
28	200 feet west - Section 2	FPC Sub Station	South of West Homosassa Trail (CR 490) and west of the FPC Transmission lines.	Progress Energy	Sub Station	NA	15	PCBs	NO	This facility was identified during the site reconnaissance as having several large electrical transformers. Electrical transformers can contain PCB dielectric fluids. Tierra did observe blue stickers on the transformers indicating non-PCB containing. There were no regulatory reports identifying this facility as having a reported release or Tier II reporting. Based on the lack of regulatory information and the observations made during the site visit this facility is given a risk ranking of LOW for potential contamination.	**LOW**	**NA**
12	Approximately 1/8 mile southeas - Section 2	Lecanto Hills Mobile Home Park	4400 West Gulf to Lake Highway, Lecanto, Florida	Lecanto Hills Mobile Homosassa. Inc.	Domestic Waste	FL01739825	17	Domestic WWTP, fecal Chlorine	NO	This facility is listed as maintaining an industrial waste water treatment facility license for treatment of domestic waste water. The mobile home park (MHP) treatment facility is listed as 0.1 MGD, no violations are noted. Based on the current regulatory status and the relative distance from the project corridor this facility is given a NO for potential contamination.	**LOW**	**LOW**
29	1,500 east of the project corridor - Section 2	Florida Gas Transmission Line Compressor Station 26	245 North Maylen Avenue, Lecanto , Florida 34461	Florida Gas Transmission	Compressor Station Tier 2	S107718406	18	Dimethyldisulfide, lubricating oil, Tert-Butyl-Alcohol, Natural Gas	YES	This facility is listed as a Tier 2 reporting facility with several chemicals used or stored on-site. The compressor facility pressurizes the natural gas in the main transmission line located adjacent to the facility. No violations were noted. Based on the current regulatory status of this facility and the relative distance from the project corridor this facility is given a risk ranking of LOW.	**LOW**	**NA**
30	Approximately 1/8 mile east of the corridor - Section 2	Crystal River Quarries, Inc.	287 Mayler Road, Crystal River, Florida 34461	Frank J. Colitz, Jr.	Mining / AST	A100267425	19 & 20	Petroleum	YES	This facility is listed as maintaining a 10,000 gallon diesel AST on site. The AST is listed as in-service with no violations reported. The AST has overfill/overspill construction and secondary containment. The mining operation appears to be on-going with large drag li observed and several steep rock faces exposed. The mine is situated in an old basin and sits relatively low compared to the project corridor located to the west. Based o the current regulatory status of this facility and the relative down gradient topography and groundwater flow this site is given a risk ranking of LOW for potential impact to the corridor.	**LOW**	**NA**
31	within corridor - Section 2	Maylen Property	North Maylen Avenue	Bill Maylen	Agricultural /Residential	NA	21 & 22	solid waste, waste oils	NO	During the site reconnaissance several types of agricultural equipment and containers were identified on this property. It appears the land has been farmed for personal use for many years. Parts and pieces of equipment are located within the proposed corridor. Based on the potential storage and use of petroleum and herbicides this facility is given a risk ranking of MEDIUM for potential contamination.	**MEDIUM**	**NA**
23	Approximately 300 feet east of corridor - Section 2	Maylen Avenue Cattle Dip Vat	North Maylen Avenue		Pesticides / metals	NA	23 & 24	Cattle Dipping Vat	NO	Remnants of a former Cattle Dipping Vat (CDV) are located on open grazing land approximately 300 feet east of the project corridor. CDVs have been associated with arsenic and other pesticides such as DDT, and DDE in the soil and groundwater. The depth to water in this area is approximately 40 to 60 feet bls. It is not likely that the historical use of this site has impacted the soils within the project corridor. However the groundwater may be impacted and warrants further study. Based on the relative distance from the project corridor this site is given a risk ranking of MEDIUM for potential contamination.	**MEDIUM**	**HIGH**
32	1/4 mile east - Section 2	Allen Site RAF	695 North Maylen Avenue, Lecanto, Florida 34461	not reported	Residual Application Facility (RAF)	S105437532	25	Domestic waste	NO	This facility is listed as maintaining a permit for the application of residual solids (i.e.. sludge). The facility is listed as active site which effluent, reclaimed water or wastewater residuals discharge into the environment and/or monitoring is taking place. No other FDEP records were identified. This property appears to be a calf/cow operation with several large pastures visible to the east of Maylen Avenue. This site is approximately 1/4 mile east of the project corridor. No visual indications of monitoring wells or recent sludge application was observed. Based on the relative distance from the project corridor and the current FDEP records indicating no violations this site is ranked LOW for potential contamination.	**LOW**	**NA**
33	within corridor - Section 2	Former Limerock mine	North of West Sanction Road and west of North Maylen Road	Unknown	Mining	NA	26	solid waste	NO	This facility was identified during the site reconnaissance. Located within the proposed corridor a large excavated area was observed. This limerock mine has been closed for some time with vegetation identified throughout the remaining pit. No solid waste dumping or other environmental impacts were observed, i.e.. shooting areas, illicit dumping, abandoned vehicles. There are no FDEP files available for this facility and no environmental concerns identified during the site visit. Based on the lack of regulatory information and the observations made during the site visit this facility is given a risk ranking of NO for potential contamination.	**NO**	**NA**
15	Approximately 50 feet north east of the eastern edge of the corridor - Section 2	Damrons Auto Salvage / LKQ	4950 West Norvell Bryant Highway	Chuck Class, GM - Jerry Runnels	AST / RCRA	A100162885 / 982105694	28 & 29	Petroleum products storage and use	AST	This automotive salvage yard is listed as maintaining a 500 gallon non-regulated diesel AST. The facility also is listed as a RCRA SQG of hazardouse waste. The materials stored on-site are aoutomotive fluids removed from vehicles. These fluids include, waste oil, transmission fluid, new lube oil, antifreeze, and brake fluids. The facility reportedly has these materials removed as-needed from the facility. No violations are noted. This facility appears to be well maintained and housekeeping appears neat. The project corridor passes within 50 feet of the southwest corner of the salvage yard property. Within the property boundary is a large chain link fence followed by several acres of used vehicles stacked neatly in rows and columns. There are no obvious indications of environmmetal impact near the property boundary closest to the project corridor. Based on the lack of any regulatory violations and the observations made during the site reconnaissance this site is given a risk ranking of LOW for potential impact to the project corridor.	**LOW**	**MEDIUM**
17	Within corridor - Section 2	Citrus Sand & Debris, Inc.	1590 North Quarterback Terrace, Crystal River, Fl.	Citrus Sand & Debris	Mining & Yard waste	4009P30002	30	Leachate & Solid Waste	NO	This facility was identified during the site reconnaissance and on historical aerial photographs. Located south of Norvel Bryant Highway and west of North Knoll Road a large open pit sand mine operation was observed. There are no FDEP files available for this facility and no environmental concerns identified during the site visit. The facility was in operation at the time of the site visit. Several trucks were observed entering the site and loading with mined fill material from the site. The excavation area appears to be vary large, deep, directly aligned with the proposed corridor. Based on the lack of regulatory information and the observations made during the site visit this facility is given a risk ranking of LOW for potential contamination.	**LOW**	**MEDIUM**
19	Approximately 1/4 mile north east of the corridor - Section 2	Pine Ridge Illegal dump site	NA	NA	Solid waste	NA	32	solid waste, paints, oil, solvents	NO	This site was identified in the original PD&E CSER and was also identified during the site reconnaissance. Several areas along a dirt jeep trail were observed to have illicit dumping on-going. Materials identified included household trash, vegetation, tree stumps and cut wood, and white goods. No putrescent, drums, paint cans or containers were identified. This area of dumping is 50 ft from the closest portion of the corridor. Based on the relative distance and the lack of any major environmental impact indicators, i.e.. stains, sheen, pits, tanks, drums, containers, odors etc this site is given a risk ranking of LOW for potential to impact the corridor. This solid waste material may require cleanup at the time of construction but does not appear to have an environmental impact to the project and should be considered de'minimus in nature.	**LOW**	**MEDIUM**
34	Approximately 1/4 mile north east of the corridor - Section 2	Citrus County Charles Black II WTP / a.k.a. Meadow crest WTP	1950 N Water Plant Road, Citrus County	Citrus County Utilities	WTP / AST	S107715628 / A100131631	33	Chlorine - diesel fuel	YES	This facility is listed as a Tier 2 reporting facility. The facility stores a maximum amount of 600 pounds liquid chlorine. There have been no violations reported for this facility. A release of chlorine gas to the atmoshere would not directly impact the soil or groundwater within the project cooridor. The site also maintains a 1000 gallon diesel AST used to fuel an emergency generator. The AST does have secondary containment and no violations are noted. Based on the type of Tier 2 chemical present, liquid chlorine under pressure and gas at ambient pressures, the risk ranking for this site is LOW for potential to impact the project cooridor. Additionally, the AST located on site is listed as in-service with no violations reported. Based on the relative distance and downgradient groundwater flow direction from the project corridor the diesel AST is given a risk ranking of LOW for potential impact to the corridor.	**LOW**	**NA**
35	Approximately 1/8 mile east of the project corridor - Section 2	Citrus County Charles Black II WWTP / a.k.a. Meadow crest WWTP	Pine Ridge Subdivision	Citrus County Utilities	Domestic Waste	S107715628	34 & 35	Domestic WWTP	NO	This facility is listed as maintaining an industrial waste water treatment facility license for treatment of domestic waste water, no violations are noted. Based on the current regulatory status and the relative distance from the project corridor this facility is given a LOW risk ranking for potential contamination.	**LOW**	**NA**
36	within corridor - Section 3	Pig Farm / Residential facility		NA	solid waste	NA	36 & 37	solid waste	YES	This facility was identified during the site reconnaissance and through aerial photographs as having several large ASTs on the property and goats and pigs. There is a runoff area on-site were rinse water drains and pools. There are possible petroleum, pesticide, and fecal contaminants on-site. Additional investigation is warranted. A site risk ranking of MEDIUM was given to this site for potential to impact the corridor.	**MEDIUM**	**NA**
37	Approximately 1/4 mile west of the corridor - Section 3	Citrus County Utilities Crystal Acres MHP WWTP	2850 N Crede Avenue, Crystal River, Florida	Kenneth Cannon	Domestic SWD	S103094107	38	Domestic WWTP , Fecal, Chlorine	NO	This facility is listed as maintaining an industrial waste water treatment facility license for treatment of domestic waste water. The mobile home park (MHP) treatment facility is listed as 0.1 MGD, no violations are noted. Based on the current regulatory status and the relative distance from the project corridor this facility is given a NO for potential contamination.	**NO**	**NA**

Table 1 List of Facilities/Sites that have been identified, reviewed, and ranked for environmental risk.

MAP / SITE ID	DISTANCE/ DIRECTION FROM CORRIDOR DIRECTION	PROPERTY/ BUSINESS NAME	PROPERTY ADDRESS	PROPERTY OWNER	FACILITY TYPE	FACILITY ID NUMBER	PHOTOGRAPH NUMBER (s)	CONTAMINATION CONCERN	STORAGE TANKS	RISK DISCUSSION	CURRENT RISK RANKING	**PREVIOUS** RANKING
20	Within corridor - Section 3	Iguana Path illegal dump sites	NA	NA	Solid waste	NA	39	solid waste,	NO	This site was identified in the original PD&E CSER and was also identified during the site reconnaissance. The site appears to be a former saw mill. Large piles of wood debris, stumps, bark, mulch, are throughout the property. A shed with the saw mill is observed toward the south of the property. No putrescent, drums, paint cans or containers were identified. Based on the lack of any major environmental impact indicators, i.e.. stains, sheen, pits, burn piles, tanks, drums, containers, odors etc this site is given a risk ranking of LOW for potential to impact the corridor. This solid waste material (wood) may require cleanup at the time of construction but does not appear to have an environmental impact to the project and should be considered de'minimus in nature.	LOW	MEDIUM
38	Within corridor - Section 3	CSX Rail corridor	NA	CSX	Railroad	NA	41	Arsenic, Creosote, Petroleum Products	NO	This railroad crosses the project corridor north of West Power line Road. Railroads have historically been associated with Arsenic and Creosote contamination. Arsenic based herbicides were used for many years to remove vegetation from the railroad right of way. Creosote railroad ties are still used to build the rail. Both of these contaminants can remain in the soils for many years. Based on the historical evidence that railroad corridors can contaminate the soil and groundwater this site is given a risk ranking of MEDIUM for potential impact to the corridor.	MEDIUM	NA
39	< 1/4 mile west of the project corridor - Section 3	Progress Energy Sub Station	6642 North Marylois Point, Crystal River, Florida 34428	Progress Energy	Tier 2	S107722489	42 & 43	Sulfuric Acid and P-Nitroaniline	YES	This facility is listed as a Tier 2 reporting facility due to the storage of approximatly 2 gallons of sulfuric acid and 1000 pounds of P-Nitroaniline (mineral oil). The acid is stored in lead-acid batteries used for backup power. The P-Nitroaniline is stored in an AST located 250 feet southeast of the main gate. The use of this material is for dielectric fluids in transformers. . Tierra contacted Progress Energy environmental contact Ms. Betty Carter regarding the stockpiled soil at the facility. Ms. Carter indicated this site is used as a staging area for mineral oil impacted soil. The soils are staged until they gather enough material to dispose of off site. Mineral oil is a non-toxic organic oil used in transformers. No violations have been reported at this facility. No RCRA violations were identified for possible PCB contamiantion. Based on the current regulatory staus of this facility the site is ranked as LOW for potential to impact the project cooridor.	LOW	NA
40	Within corridor - Section 3	North Bull Townsend Point Illegal Dump Sites	NA	NA	Solid waste	NA	44 & 45	solid waste, paints, oil, solvents	NO	This site was identified during the site reconnaissance. An area along a dirt driveway was observed to have illicit dumping on-site. Materials identified included household trash, plastic containers 5 gallon to 30 gallon, and building materials were identified. This area is approximately 100 ft east of the closest portion of the corridor. Based on the relative distance and the observed environmental indicators, i.e.. stains, sheen, pits, burn piles, tanks, drums, containers, odors etc this site is given a risk ranking of MEDIUM for potential to impact the corridor.	MEDIUM	NA
22	Within corridor - Section 3	Basswood Avenue Illegal Dump Sites	NA	NA	Solid waste	NA	46, 47, & 48	solid waste, paints, oil, solvents	NO	This site was identified in the original PD&E CSER and was also identified during the site reconnaissance. Several areas along a dirt jeep trail were observed to have illicit dumping on-going. Materials identified included household trash, vegetation, tree stumps and cut wood, and white goods. No putrescent or drums were identified. However, a kerosene lantern 1-gallon fuel can was observed to be empty with the cap off. This area is located within the project corridor. Based on the relative distance and the identification of environmental impact indicators, i.e.. stains, sheen, pits, burn piles, tanks, drums, containers, odors etc. this site is given a risk ranking of MEDIUM for potential to impact the corridor.	MEDIUM	MEDIUM
41	1/4 mile south of the intersection of Suncoast Pkwy 2 and US 19 - Section 3 (OUTSIDE MAPPING LIMITS)	Crystal river Precast Plant	Hwy 19 & Power line Road, Crystal River Florida 33631	Jeff Median, Mgr.	RCRA / FINDS	984178996	49	SQG	NO	This facility is listed as a Small Quantity Generator of Hazardous Waste. The facility is listed as no violations reported. Based on the current regulatory status and the relative distance and cross gradient ground water flow direction this site is ranked as NO for potential impact to the corridor.	NO	NA
42	2 miles south and 1.25 miles west from the closest portions of the project corridor - Section 3 (OUTSIDE MAPPING LIMITS)	Shell former Texaco	6164 North Suncoast Blvd. Crystal River, Florida 32794	Ken Whit, Mgr.	UST / AST	984180067	50 & 51	Petroleum	YES	This facility is identified in the EDR report as being within the search limits of the project. However, after further review the facility is located 1.5 miles west of the closest portion of the project. Based on the distance and down gradient direction to the closest point on the project corridor this site is ranked as NO for potential to impact the project.	NO	NA
21	< 1/4 mile south. Site is on the west side of US 19 .- Section 3 (OUTSIDE MAPPING LIMITS)	Crystal River Quarries Inc.	7400 North Suncoast Blvd. Crystal River, Fl. 34428	Frank Colitz, Jr.	UST	9045639	52 & 53	Petroleum	YES	This facility has reported USTs and ASTs in operation since 1959. The facility reports the following tanks: (1) 500 gallon waste oil UST installed in 1981 and removed in 1981; (1) 1,000 gallon leaded gas UST installed in 1960 and removed in 1989; (1) 1,000 gallon unleaded gas UST installed in 1981 and removed in November 1989; (1) 6,000 gallon diesel AST installed 1980 and removed November 1989; (1) 6,000 gallon diesel AST installed 1959 and removed in 1989; (2) 4,000 gallon diesel AST installed 1959 removed 1989; (10,000 gallon diesel ASTs installed 1989 in-service; (1)10,000 gallon unleaded gasoline AST installed 1989 and in-service; (1)15,000 gallon heating oil AST installed 1959 and removed 1989. The facility has two listed FAC ID numbers. FAC ID 8518659 is listed as closed and FAC ID number 9045639 is listed as open. According to the FDEP OCULUS files there facility is listed as cleanup required and remediation on-going. The site is eligible for cleanup under the EDI Pre-Approval program with a site score of 11. The current active site score is 34. A review of available assessment data depict a diesel plume located on-site with an estimated radiusof 100 ft. The groundwater is shown to be toward the the west. Based on the distance and downgradient direction from the closest portion of the project corridor this site is given a risk ranking of LOW.	LOW	LOW

Note	Map IDs less than 24 refl;ect the identification number from the 1998 SEIR
Note	The sites are listed in geographical orientation from south to to north and therefore DO NOT follow numerical
Light Blue	Designated for facilities/sites with a "No" risk ranking
Light Yellow	Designated for facilities/sites with a "LOW" risk ranking
Rose	Designated for facilities/sites with a "MEDIUM or HIGH" risk ranking
** Previous **	Designated for October, 1997 CS Those site noted as NA were not previously evaluated

DRAFT

FDEP Map Direct Potential Contamination Sites Maps

DRAFT

FDEP Map Direct Potential Contamination Sites

February 14, 2020

DEP Cleanup Sites

- BROWNFIELD SITES
- PETROLEUM
- SUPERFUND
- OTHER WASTE CLEANUP

Petroleum Contamination Monitoring (PCTS) Discharges from STCM

- ELIGIBLE DISCHARGES OPEN
- INELIGIBLE DISCHARGES OPEN

1:9,028

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

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FDEP Map Direct Potential Contamination Sites

February 14, 2020

DEP Cleanup Sites

- BROWNFIELD SITES
- PETROLEUM
- SUPERFUND
- OTHER WASTE CLEANUP

Petroleum Contamination Monitoring (PCTS) Discharges from STCM

- ELIGIBLE DISCHARGES OPEN
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1:9,028

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0 0.13 0.25 0.5 km

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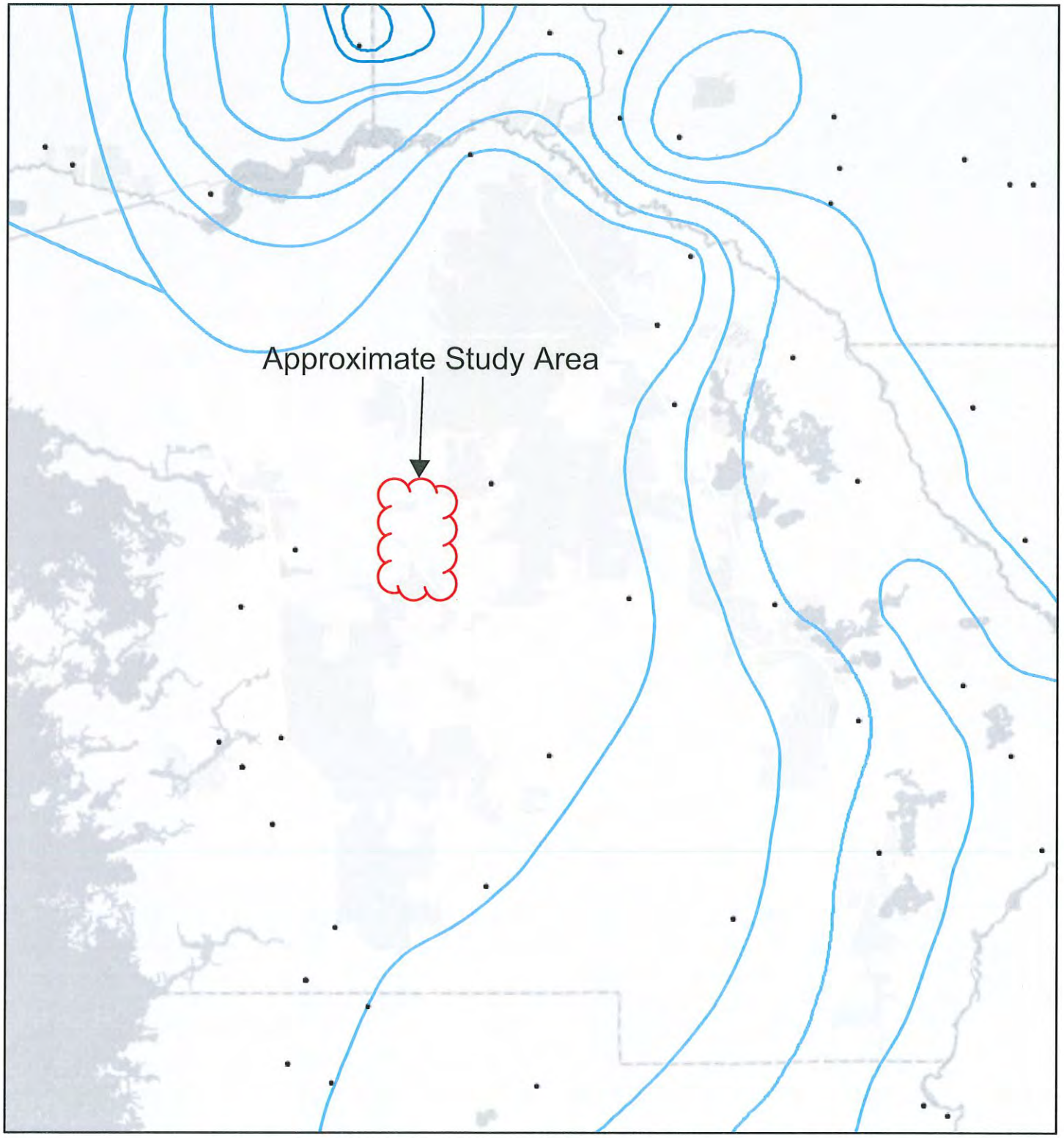
Upper Floridan Aquifer Potentiometric Surface Map 2017

DRAFT

Upper Floridan Aquifer Potentiometric Surface



2/12/2020, 4:30:53 PM

1:288,895

0 2 4 8 mi

0 3.5 7 14 km

Wells

September, 2017 Potentiometric Contours (feet)

10 - 50

60 - 100

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Web AppBuilder for ArcGIS
Florida Geological Survey

Former Limerock Mine – Carroll's Lecanto Pit

DRAFT

Carroll Contracting - Carroll Lecanto Pit

Producer in Citrus county in Florida, United States with commodity Limestone, General

Map (https://www.google.com/maps/place/28.87915,-82.50327/@28.87915,-82.50327,12z/data=!3m1!1e3)	XML (/mrds/xml/10306114)
JSON (/mrds/json/10306114)	KML (/mrds/kml/10306114)

Geologic information

Identification information

Deposit ID	10306114 (/mrds/show-mrds.php?dep_id=10306114)
MRDS ID	AG00047
Record type	Site
Current site name	Carroll Contracting - Carroll Lecanto Pit

Geographic coordinates

Geographic coordinates:	-82.50327, 28.87915 (WGS84)
Location accuracy	10000 *(meters)*

Political divisions (FIPS codes)

Citrus (county)
Florida (state)
United States (country)
North America (continent)
Land (continent)

USGS map quadrangles

Crystal River (quadrangle 1:24,000 scale)
Inverness (quadrangle 1:100,000 scale)
Plant City (quadrangle 1:250,000 scale)

Hydrologic units (watersheds)

Crystal-Pithlachascotee (hydrologic unit)
Tampa Bay (hydrologic accounting unit)
Peace-Tampa Bay (hydrologic subregion)
South Atlantic-Gulf (hydrologic region)

Geographic areas

Country	State	County

Country	State	County
United States	Florida	Citrus

Comments on the location information

4 Miles Ene of Crystal River

Commodities

Commodity	Importance
Limestone, General	Primary

Materials information

Materials	Type of material
Limestone	Ore

Nearby scientific data

(1) Hawthorn Group (/geology/state/sgmc-unit.php?x=-82.50327&y=28.87915)

List (/general/near-point.php?x=-82.50327&y=28.87915&d=0.01&format=x+82.50327&y=28

Geologic structures

Type of structure	Regional
Structure description	Limestone

Economic information

Economic information about the deposit and operations

Development status	Producer
Commodity type	Non-metallic
Significant	No

Reference information

Bibliographic references

Deposit

Spencer, S.M., 1993, Industrial Minerals Industry Directory Of Florida, Florida Geological Survey, Information Circular Ic-109, 30 Pp.Spencer, S.M., 1993, Industrial Minerals Industry Directory Of Florida, Florida Geological Survey, Information Circular Ic-109, 30 Pp.

Reporter information

Type	Date	Name	Affiliation	Comment

Type	Date	Name	Affiliation	Comment
Reporter	01-JUL-1997	Hendrickson, J. C. (Spencer, S. M.)	Florida Geological Survey	
Editor	04-NOV-2002	Nicholson, S.W.	U.S. Geological Survey	reformated date column; calculated latitude and longitude in decimal degrees; added Location Precision, Continent, Country, State, Commodity Code, Ore Minerals Code fields; changed Major Commodity field content and Ore Minerals field content to conform to

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Accessibility (https://www2.usgs.gov/laws/accessibility.html) | Site Map (https://www.usgs.gov/sitemap.html) |

Contact USGS (https://answers.usgs.gov/)

U.S. Department of the Interior (https://www.doi.gov/) | DOI Inspector General (https://www.doioig.gov/) |

White House (https://www.whitehouse.gov/) | E-gov (https://www.whitehouse.gov/omb/management/egov/) |

No Fear Act (https://www.doi.gov/pmb/eeo/no-fear-act) | FOIA (https://www2.usgs.gov/foia)

DRAF

Lecanto Mine

Past Producer in Citrus county in Florida, United States with commodity Stone, Crushed/Broken

Map (https://www.google.com/maps/place/28.91917,-82.47547/@28.91917,-82.47547,12z/data=!3m1!1e3)	XML (/mrds/xml/10265049)
JSON (/mrds/json/10265049)	KML (/mrds/kml/10265049)

Geologic information

Identification information

Deposit ID	10265049 (/mrds/show-mrds.php?dep_id=10265049)
MAS/MILS ID	0120170028
Record type	Site
Current site name	Lecanto Mine

Geographic coordinates

Point of reference	Town
Geographic coordinates:	-82.47547, 28.91917 (WGS84)
Elevation	32
Location accuracy	500 *(meters)*

Political divisions (FIPS codes)

Citrus (county)
- Florida (state)
  - United States (country)
    - North America (continent)
      - Land (continent)

USGS map quadrangles

Holder (quadrangle 1:24,000 scale)
- Inverness (quadrangle 1:100,000 scale)
  - Plant City (quadrangle 1:250,000 scale)

Hydrologic units (watersheds)

Withlacoochee (hydrologic unit)
- Tampa Bay (hydrologic accounting unit)
  - Peace-Tampa Bay (hydrologic subregion)
    - South Atlantic-Gulf (hydrologic region)

Geographic areas

Country	State	County
United States	Florida	Citrus

Public Land Survey System information

Meridian	Township	Range	Section	Fraction	State
Tallahassee	018 S	018 E	15		Florida

Commodities

Commodity	Importance
Stone, Crushed/Broken	Primary

Nearby scientific data

Town (1)	Hawthorn Group (/geology/state/sgmc-unit.php?x=-82.47547&y=28.91917)	List (/general/near-point.php?x=-82.47547&y=28.91917&d=0.01&form=t=82.47547&y=28	Map (/mrds/map-us.html?x=-82.47547&y=28

Economic information

Economic information about the deposit and operations

Operation type	Surface
Development status	Past Producer
Commodity type	Non-metallic
Significant	No

Land status

Ownership category	Private

Ownership information

Type	Unknown
Owner	Lecanto Materials Co., Inc.
ID	800912
Year	1979

Reference information

Links to other databases

Agency	Database name	Acronym	Record ID	Notes

Agency	Database name	Acronym	Record ID	Notes
U.S. Bureau of Mines	Minerals Availability System	MAS	0120170028	
Mine Safety and Health Administration	MSHA	MSHA	0800912	

Bibliographic references

Deposit
MSHA MINE LISTING 11-23-79.

Deposit
LOCATION BY MSHA.

Deposit
NOT ON 1980 OR 1981 MSHA LISTS

Deposit
RCF & CMS 10/81

Reporter information

Type	Date	Name	Affiliation	Comment
Reporter	03-NOV-1983	Eastern Field Operations Center (EFOC)	U.S. Bureau of Mines	

DOI Privacy Policy (https://www.doi.gov/privacy) | Legal (https://www.usgs.gov/laws/policies_notices.html) |
Accessibility (https://www2.usgs.gov/laws/accessibility.html) | Site Map (https://www.usgs.gov/sitemap.html) |
Contact USGS (https://answers.usgs.gov/)

U.S. Department of the Interior (https://www.doi.gov/) | DOI Inspector General (https://www.doioig.gov/) |
White House (https://www.whitehouse.gov/) | E-gov (https://www.whitehouse.gov/omb/management/egov/) |
No Fear Act (https://www.doi.gov/pmb/eeo/no-fear-act) | FOIA (https://www2.usgs.gov/foia)

SUPPLEMENTAL ADDENDUM TO THE CONTAMINATION TECHNICAL MEMORANDUM FOR THE REALIGNMENT OF KNOLL ROAD

Florida's Turnpike Enterprise

Suncoast Parkway 2 - SR 44 to CR 486

Knoll Road Realignment

Citrus County, Florida

Financial Management Number: 442764-1

Date: May 29, 2020

DRAFT

Memo

To: Eric Krebill, PG
District Contamination Impact Coordinator
Florida's Turnpike Enterprise

May 29, 2020

From: Justin Holley, GIT
Staff Scientist
Tierra

Re: Supplemental Addendum to the Contamination Technical Memorandum for the Realignment of Knoll Road

For: Knoll Road Realignment
Suncoast Parkway 2 from SR 44 to CR 486
Citrus County, Florida
FPID: 442764-1-32-01
Tierra Project No.: 6511-18-108E

This Contamination Technical Memorandum (Tech Memo) was produced to support the Knoll Road realignment and connection to CR 486. The Knoll Road realignment is associated with the Suncoast Parkway 2 project in Citrus County. The methodology for this Contamination Tech Memo generally followed the contamination screening process as described in Part 2, Chapter 20 of the Florida Department of Transportation's Project Development and Environment Manual as modified by the project-specific scope of work. The properties within and adjacent to the proposed Knoll Road realignment, Pond DRA-1A, and existing roadways where improvements (Ziggy Street) are planned were investigated and evaluated for potential contamination impacts to the project. This includes a review of known contamination sites (as identified in previous reports) and a search for new discharges or other potential contamination impacts not reported in previous contamination screenings.

The methodology employed for this contamination screening included the following tasks:

- Review of recent reports related to the project: Level I Contamination Screening Evaluation Report-ponds (Tierra, March 10, 2020) and Contamination Technical Memorandum-mainline (Tierra, March 10, 2020);
- Conduct desktop research using Florida Department of Environmental Protection's MapDirect and OCULUS databases to ascertain updated information for the contamination sites identified in the March 2020 reports;
- Adjust risk ratings, if necessary, based on updated contamination information; and
- Conduct desktop search for any new contamination sites within the Chapter 20-recommended screening distances from the proposed Knoll Road realignment corridor, Pond DRA-1A, and existing roadways where improvements (Ziggy Street) are planned using Florida Department of Environmental Protection's MapDirect and OCULUS databases and provide appropriate risk ratings.

It should be noted that field visits were not conducted. Additionally, other research components such as historical aerials, USGS maps, hydrology, etc. are provided in previous documents.

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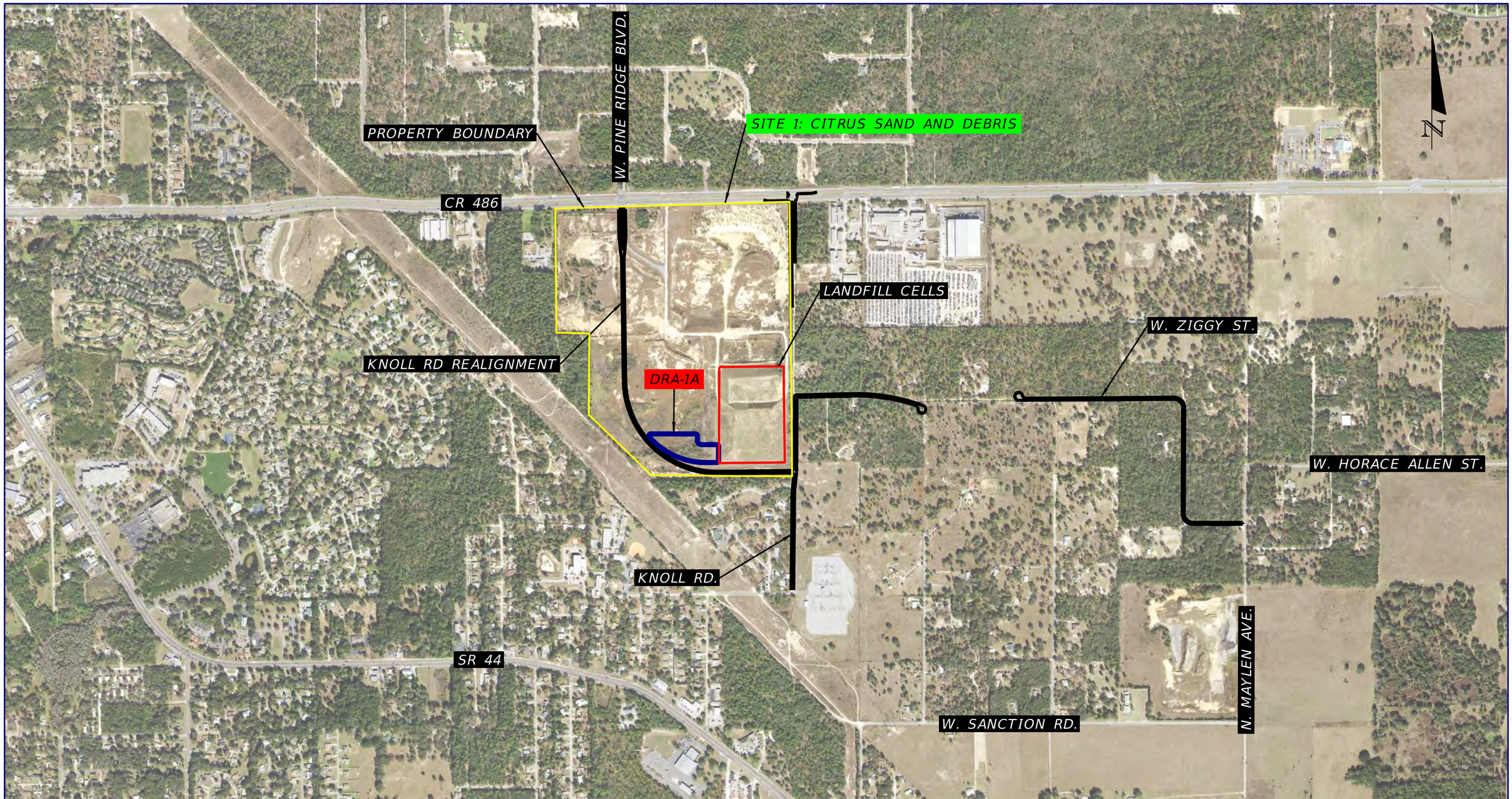
Potential Contamination Sites & New Pond Site	Risk Rating	Comments
Site 1: Former Citrus Sand & Debris, Inc. 1590 North Quarterback Terrace, Crystal River WACS FAC ID 40459 FAC ID 9300729	Low	This facility was evaluated in the previously submitted Level I Contamination Screening Evaluation Report-pond (Tierra, March 10, 2020) and Contamination Technical Memorandum-mainline (Tierra, March 10, 2020) for the Suncoast Parkway 2 from SR 44 to CR 486 project. The proposed Knoll Road realignment corridor is located within the property boundaries of this site. This facility formerly operated as a Class III Landfill, now owned by the FTE. Three closed landfill cells are located in the southeast portion of the property. The landfill cells were permitted to receive Construction and Demolition (C&D) waste, yard trash, tires, asbestos, carpet, glass, plastic, and furniture. The remainder of the property did not receive waste material. The southern boundary of the closed landfill area is located approximately 90 feet north of the proposed Knoll Road realignment corridor. The most recent analytical data included in the *2nd Semi-Annual 2019 Water Quality Monitoring Report* dated January 14, 2020 (see Supplemental Information) indicates that concentrations of aluminum above the Groundwater Cleanup Target Level (GCTL) were detected in monitoring wells BW-1, MW-3, MW-5R, and MW-7R. Cadmium, chromium, and lead were detected above their respective GCTLs in MW-3. Dissolved iron concentrations were detected above its GCTL in BW-1, MW-3, MW-4R, MW-5R, and MW-7R. Groundwater flow direction was measured to the southwest (toward the east-west section of the proposed Knoll Road realignment and Pond DRA-1A). Depth to water was measured from 31.49 to 84.99 feet below top of casing in December 2019. The nearest contaminated wells are MW-4R and MW-5R. MW-4R is located approximately 90 feet north of the proposed Knoll Road realignment corridor and MW-5R is located approximately 40 feet west of the existing Knoll Road right-of-way. Additionally, two 1,000-gallon diesel fuel aboveground storage tanks were formerly maintained onsite (one removed in 2012, one removed at an unknown date). No tank location information was found and no discharges are reported. It does not appear that construction of the Knoll Road realignment corridor will impact any areas of the site that contain buried debris. Due to the depth to groundwater at this site, it is unlikely that potential contamination-related impacts to construction will occur, since dewatering activities will not be required during the construction of the new roadway. Given these factors, this facility is assigned a risk rating of Low.
Pond DRA-1A	Medium	This pond site was not evaluated in previous submittals. Pond DRA-1A is located in the southern portion of Site 1 referenced above (Sheet 1). Pond DRA-1A is located adjacent west of the closed landfill cells. Buried debris is not known to be associated with the area of Pond DRA-1A. Monitoring wells associated with the landfill were last sampled in December 2019. Laboratory analytical results indicated that aluminum, cadmium, chromium, iron, and lead were detected above their GCTLs in MW-3, located approximately 20 feet north of Pond DRA-1A. The depth to water in MW-3 has been measured from 49.07 to 50.91 feet below top of casing between April 2013 and December 2019. The groundwater flow direction in the area was measured to the southwest (from MW-3 toward Pond DRA-1A). The elevation of the pond bottom has not been determined as of the writing of this report. However, preliminary information received from the project designer indicates that dewatering will not be required during construction due to the extreme depth to groundwater as compared to land surface. The documentation reviewed does not suggest impact from contamination during construction will occur from contact with debris, contaminated soil, or contaminated groundwater. Dewatering support during construction does not appear likely. FTE already owns this parcel and therefore transfer of contamination liability is not relevant. For these reasons, Level II testing is not recommended. However, the pond has not yet received approval of its Environmental Resource Permit (ERP). As part of the ERP, the elevated levels of metals detected through semi-annual groundwater testing at MW-3 will trigger a request from the permitting agency to the permittee to determine if operation of Pond DRA-1A will negatively impact the fate and transport of contamination at MW-3. A mounding analysis or some other form of modeling will likely be required to determine if adjustments will be necessary to avoid impact to the contamination plume at MW-3. Although Level II testing is not recommended, the ERP evaluation has not yet been completed and therefore Pond DRA-1A is assigned a risk rating of Medium.

One site of concern and one pond site were investigated and evaluated in this Contamination Tech Memo. The Former Citrus Sand & Debris, Inc. site is assigned a risk rating of Low and no additional action is recommended. Pond DRA-1A is assigned a risk rating of Medium. Although no Level II testing is recommended, additional evaluation will be performed by others during the process to secure the Environmental Resource Permit. A Potential Contamination Sites and Pond Location Map and supplemental information associated with the Citrus Sand & Debris Landfill is attached.

Respectfully Submitted,

Justin Holley, GIT
Staff Scientist
Tierra
7351 Temple Terrace Highway, Tampa, Florida 33637
Office 813.989.1354 | *Cell* 813.240.3722 | www.tierraeng.com | *jholley@tierraeng.com*



POND

POTENTIAL CONTAMINATION SITES AND POND LOCATION MAP

SOURCE: FDOT SURVEY AND MAPPING DATED 2017

0 200 1000
Feet

NAME GREEN = LOW RISK RATED SITE

NAME RED = MEDIUM RISK RATED POND

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
			TIERRA PROJECT NO.: 6511-18-108E

TIERRA, INC.
7351 TEMPLE TERRACE HIGHWAY
TAMPA, FLORIDA 33637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 44	CITRUS	442764-1-32-01

SUNCOAST PARKWAY 2 FROM
SR 44 TO CR 486
KNOLL ROAD REALIGNMENT

SHEET NO. 1

bgarcia 5/29/2020 9:01:52 AM J:\6511\2018 Files\6511-18-108 Suncoast Pkwy 2\Microstation\rdgeoEnvPotContam_Knoll0

Supplemental Information – Site 1: Former Citrus Sand & Debris Inc.

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WATER QUALITY MONITORING REPORT

2nd SEMI-ANNUAL 2019

CITRUS SAND & DEBRIS I C&D DEBRIS DISPOSAL FACILITY

1590 NORTH QUARTERBACK TERRACE

CRYSTAL RIVER, FLORIDA 34423

WACS FACILITY ID # 40459

DEP PERMIT # 21318-008-SF/12

Prepared for:

State of Florida Department of Transportation

Florida's Turnpike Enterprise

Turkey Lake Service Plaza

MP 263, Building 5315

Ocoee, FL 34761

&

Florida Department of Environmental Protection

Southwest District Office

Compliance Assurance Program

13051 North Telecom Parkway

Temple Terrace, Florida 33637-0926

Prepared by:

AECOM

7650 Corporate Center Drive

Suite 400

Miami, Florida 33126

(305) 884-8900

January 14, 2020

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1.0 INTRODUCTION

AECOM is pleased to present the 2nd Semi-Annual 2019 Water Quality Monitoring Report for the closed Citrus Sand & Debris I Construction and Demolition (C&D) Disposal Facility. This report presents a summary of the groundwater sampling activities conducted at the site as required by the Florida Department of Environmental Protection (FDEP) **Permit #21318-008-SF/12** issued on January 9, 2019, for continued long-term care of this closed landfill located at 1590 North Quarterback Terrace, Crystal River, Florida in Citrus County and the Water Assurance and Compliance System (WACS) identification number for the site is **40459**. A copy of the FDEP permit is can be found in **Appendix A**. A local area map is presented as **Figure 1** and a site map of the facility is presented as **Figure 2**. The site is managed by the FDEP Southwest District Office.

2.0 QUALITY ASSURANCE

Groundwater sampling was performed in accordance with the FDEP Standard Operating Procedures (DEP-SOP-001/01) and the applicable field sampling data was included on Form #FD 9000-24. All laboratory analyses were performed by Pace Analytical Services, LLC (Pace) with Florida Certification # E83079.

All samples were collected, preserved, documented, and delivered to Pace for analyses of the parameters specified in the permit. The laboratory results were processed by Pace using Florida DEP *Automated Data Processing Tool* (ADaPT) software; this software programs the review of the data for accuracy and consistency. Pace provided AECOM with the required ADaPT Electronic Data Deliverables (EDDs) consisting of a Portable Document Format (PDF) and comma separated text files (.csv format) for both laboratory and field data produced using Microsoft Excel as well. Subsequent to the completion and submittal of this report, the EDDs will be submitted through Florida DEP's Business Portal website: http://www.fldepportal.com/go/.

The **Water Quality Monitoring Certification** Form [62-701.900(31) F.A.C.] is presented in **Appendix B**.

A copy of the laboratory report and chain of custody documentation can be found in **Appendix C**. The groundwater sampling logs are presented in **Appendix D**.

3.0 WATER QUALITY MONITORING

3.1 Groundwater Monitoring Results

The groundwater samples from BW-1, MW-3, MW-4R, MW-5R and MW-7R were preserved and sent to Pace under chain of custody procedures to be analyzed for parameters specified in the permit. Specifically, the samples were analyzed for total ammonia, chlorides, nitrates, sulfates, total dissolved solids (TDS), aluminum, arsenic, cadmium, chromium, iron, lead, mercury, sodium, xylenes, and those

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parameters listed in EPA Methods 601 and 602.

The following section briefly summarizes the December 2019 groundwater sampling event results which exceeded the Chapter 62-777, F.A.C Table I Groundwater Cleanup Target Levels (GCTLs) and how they compare to the results of the previous sampling events. Remaining parameters that were analyzed were reported below GCTL or method detection limits (MDL).

- During the December 2019 sampling event, the **Nitrogen Ammonia** concentration in MW-4R (19.4 milligrams per liter [mg/L]) exceeded the GCTL of 2.8 mg/L. No nitrogen ammonia was detected in any of the other monitoring wells sampled except for MW-5R which was reported below the GCTL Level of 2.8 mg/L. As shown in the groundwater quality trend graphs in **Appendix E**, reported nitrogen ammonia levels in MW-4R have historically increased from 2013 to 2018, and have decreased since the June 2018 sampling event. Nitrogen ammonia levels have remained generally consistent and well below the GCTL in all other monitoring wells.

  The FDEP no longer enforces the GCTL for **Nitrogen Ammonia**, as per the FDEP Solid Waste Memorandum #SWM-13.10 dated 12/3/12 (titled *Monitoring and Evaluation of Ammonia in Ground Water at Solid Waste Management Facilities*), unless the ground water discharges into surface water and is likely to cause a violation of the surface water standards for ammonia. The closest down gradient surface water is a storm water retention pond located approximately 4,000 feet west- northwest of the facility; therefore, it is not expected that the surface water quality standard would be violated.

- The December 2019 **Aluminum** concentration in BW-1 (3640 µg/L), MW-3 (35,100 µg/L), MW-5R (292 µg/L), and MW-7R (221 µg/L) exceeded the GCTL of 200 µg/L. As illustrated in the groundwater quality trend graphs in **Appendix E**, reported aluminum levels in BW-1, MW-3, MW-5R and MW-7R do not appear to indicate any downward or upward long-term trend in any of the wells. The exceedances noted in MW-3, MW-5R and MW-7R during this sampling event continue to be localized. Aluminum appears to be a naturally occurring aquifer constituent as is evident in samples collected from background well BW-1 on site, included in Table 1 as a reference, and during previous sampling events.

- The December 2019 **Arsenic** concentration did not exceed the GCTL of 10 µg/L in any of the monitoring wells sampled. It should be noted that the exceedances for Arsenic noted in MW-7R during recent sampling events was not reported during this sampling event.

- The December 2019 **Cadmium** concentration in MW-3 (10.1 µg/L) exceeded the GCTL of 5 µg/L. As illustrated in the groundwater quality analytical summary **Table 1,** reported cadmium levels in MW-3/3R do not appear to indicate any downward or upward long-term trend in any of the wells. The exceedance is very localized in this well. There has been a previous exceedance for Cadmium in December 2018 that was not confirmed in the resampling event.

- The December 2019 **Chromium** concentration in MW-3 (656 µg/L) has exceeded the GCTL of 100 µg/L. As illustrated in the groundwater quality analytical summary **Table 1,** reported Chromium levels

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in MW-3/3R do not appear to indicate any downward or upward long-term trend in any of the wells. The exceedance is very localized in this well. There has been one previous exceedance for Chromium in December 2018 that was not confirmed in the resampling event.

- The December 2019 **Iron** concentrations in BW-1 (2320 µg/L), MW-3 (22900 µg/L), MW-4R (11,300 µg/L), MW-5R (5,840 µg/L), and MW-7R (19,700 µg/L) exceeded the GCTL of 300 µg/L. As illustrated in the groundwater quality trend graphs in **Appendix E**, reported iron levels in BW-1, MW-3/3R, MW-4R and MW-5R have generally remained consistent across the landfill iron levels in MW-7R show a slight increase historically.

  Iron appears to be a naturally occurring aquifer constituent as is evident in the historical concentrations reported for samples collected from background well BW-1 on site, included in **Table 1** as a reference. The concentrations reported for wells BW-1, MW-4R, MW-5R and MW-7R increased from the previous sampling event in June 2019, although for wells MW-4R, MW-5R, and MW-7R the concentrations remain above the GCTLs. The Iron concentrations on site will continued to be monitored during the regular semi-annual monitoring events.

- The December 2019 **Lead** concentrations in MW-3 (34.4 µg/L) exceeded the GCTL of 15 µg/L. As illustrated in the groundwater quality analytical summary **Table 1,** reported Lead levels in MW-3/3R do not appear to indicate any downward or upward long-term trend in any of the wells. The exceedance appears to be very localized in this well. There has been one previous exceedance for Lead in December 2018 that was not confirmed in the resampling event.

- The December 2019 **pH** in BW-1 was reported as 9.00 and 5.36 for MW-7R. Both values were above and below the GCTL range of 6.5 to 8.5.

  Since the groundwater does not discharge into any surface water body, it is not likely to cause a violation of the surface water quality standard for pH. The closest down-gradient surface water is a storm water retention pond located approximately 4,000 feet west-northwest of the facility.

As reported in **Table 1,** there were no exceedances of the Total Dissolved Solids in the monitoring wells; however, the laboratory has qualified the sample results since the holding times were exceeded. This was due to an error when the samples were logged in. The results are consistent with historical data.

A summary of current and historical groundwater monitoring well analytical data is included in **Table 1**. The trend graphs of the analyzed parameters are presented in **Appendix E**.

3.2 Water Table Elevation Monitoring

In order to evaluate the groundwater flow direction in the Floridan aquifer and to measure the groundwater gradient in the area of the disposal facility, AECOM personnel measured groundwater levels from onsite monitoring wells on December 10, 2019. The depth to groundwater (DTW) measurements were collected from wells MW-1, MW-2, MW-3, MW-4R, MW-5R, MW-7R, BW-1, P-1, P-3, and P-6 using a water level indicator to measure the depth of the water table from the top of the monitoring well casing. The

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groundwater elevation for each monitoring well was calculated by subtracting the DTW measurements from the top of casing (TOC) elevations. The TOC elevations, surveyed by others, were obtained by AECOM from previous monitoring reports. Groundwater elevation hydrographs for each monitoring well are included as **Appendix F.**

The groundwater elevations were plotted to evaluate the groundwater flow direction in each depth interval of the aquifer and to determine the apparent groundwater flow direction at the site. The DTW measurements were recorded on December 10, 2019 prior to conducting groundwater sampling activities. These measurements were used to generate groundwater elevation contours. A groundwater elevation contour map, constructed from the depth-to-water (DTW) data collected on December 10, 2019, from monitoring wells MW-1, MW-2, BW-1, MW-3, MW-4R, MW-5R, and MW-7R and piezometer wells P-1, P-3, and P-6 (as required by the permit), is presented as **Figure 3**.

The recent groundwater elevation data indicates the groundwater flow direction is *predominantly towards the southwest*. This flow direction is consistent with historical groundwater flow gradients. Current and historical DTW and groundwater elevation data are presented in **Table 2**. The current water level is seasonally 0.5 feet to approximately 1 foot higher than measured in May.

4.0 CONCLUSIONS & RECOMMENDATIONS

Based on this semi-annual monitoring event, the current groundwater data are generally consistent with historical data, except that higher aluminum and iron concentrations were measured in the background well, chromium levels increased at MW-3 and arsenic levels decreased to below GCTL in MW-7. There does not appear to be any increasing or decreasing trends in the groundwater quality.

AECOM recommends continued semi-annual sampling, as per FDEP Permit #21318-008-SF/12 that was renewed on January 9, 2019.

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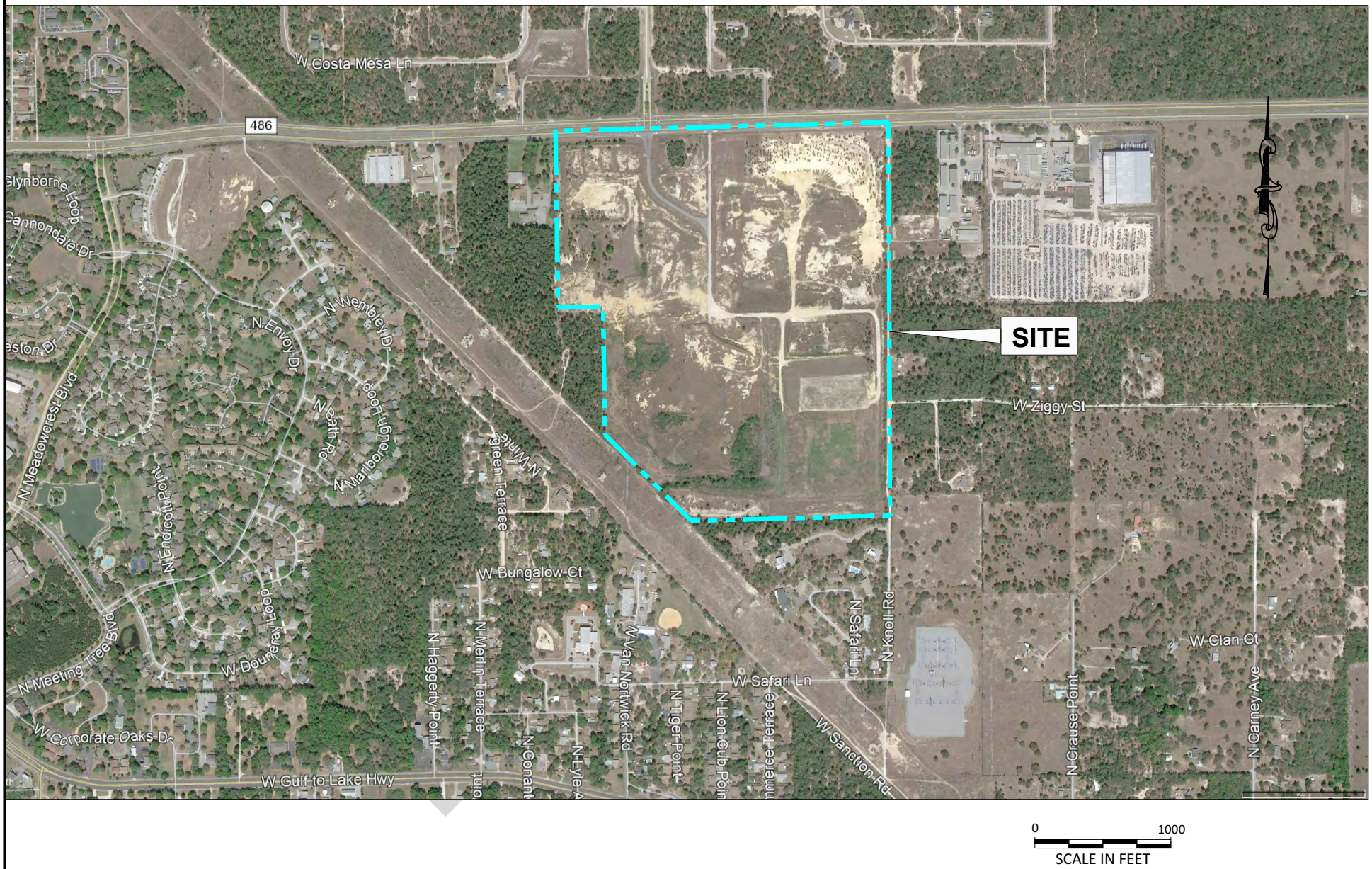
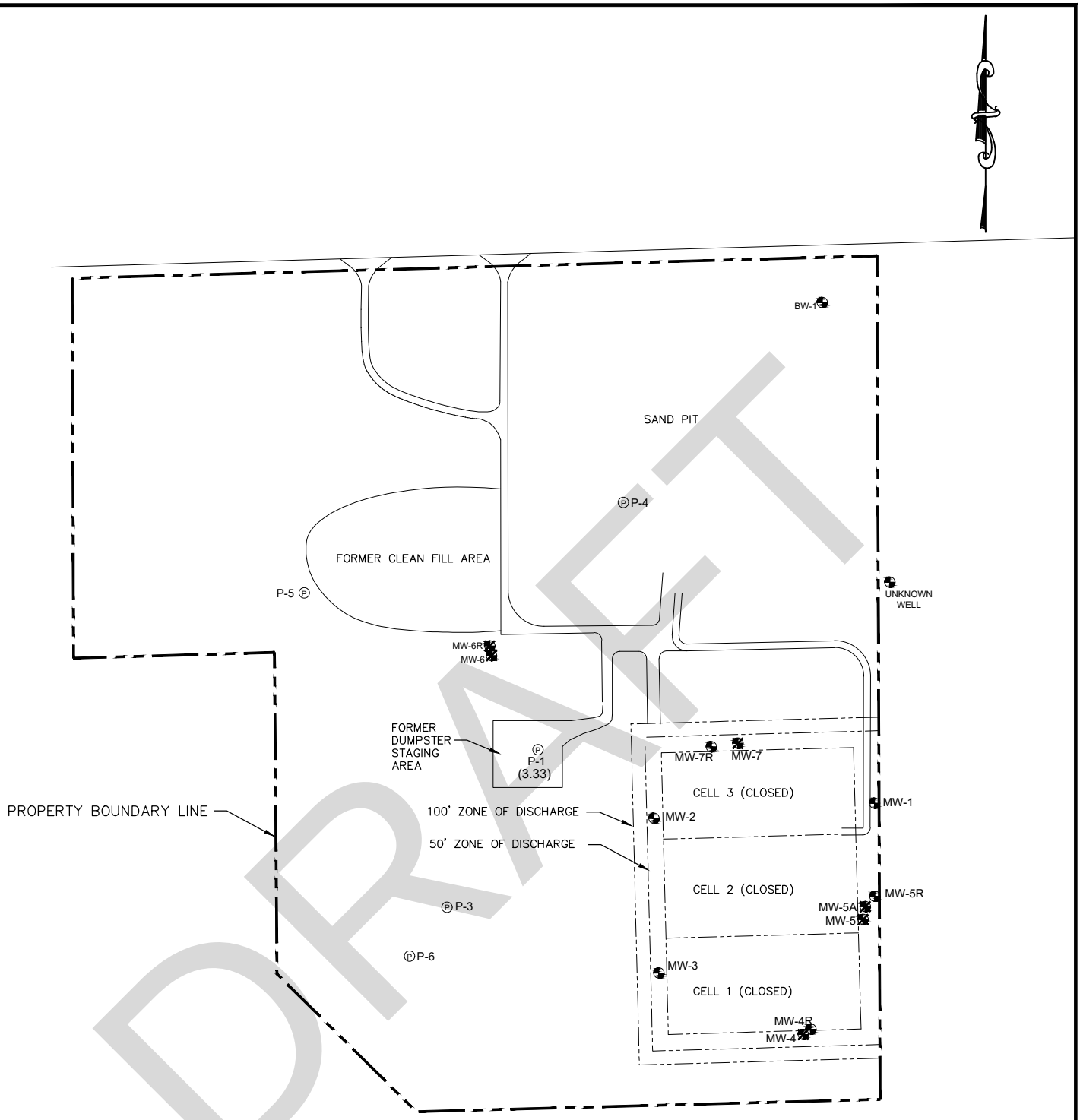


0 1000
SCALE IN FEET

D:\Aecom\ F2 LOCAL AREA2.dwg 01/05/20

DRAWN BY: RC CHECKED BY: YN DATE: JAN 20	AECOM 1020 HOLLAND DRIVE, SUITE 104 BOCA RATON, FLORIDA 33487	**Citrus Sand and Debris** 1590 N. Quarterback Terr. Crystal River, Florida	**LOCAL AREA MAP**	Figure: 1



LEGEND
- MONITORING WELL
- ABANDONED MONITORING WELL
- PIEZOMETER

SITE MAP

D:\Aecom\ site2.dwg 01/05/20

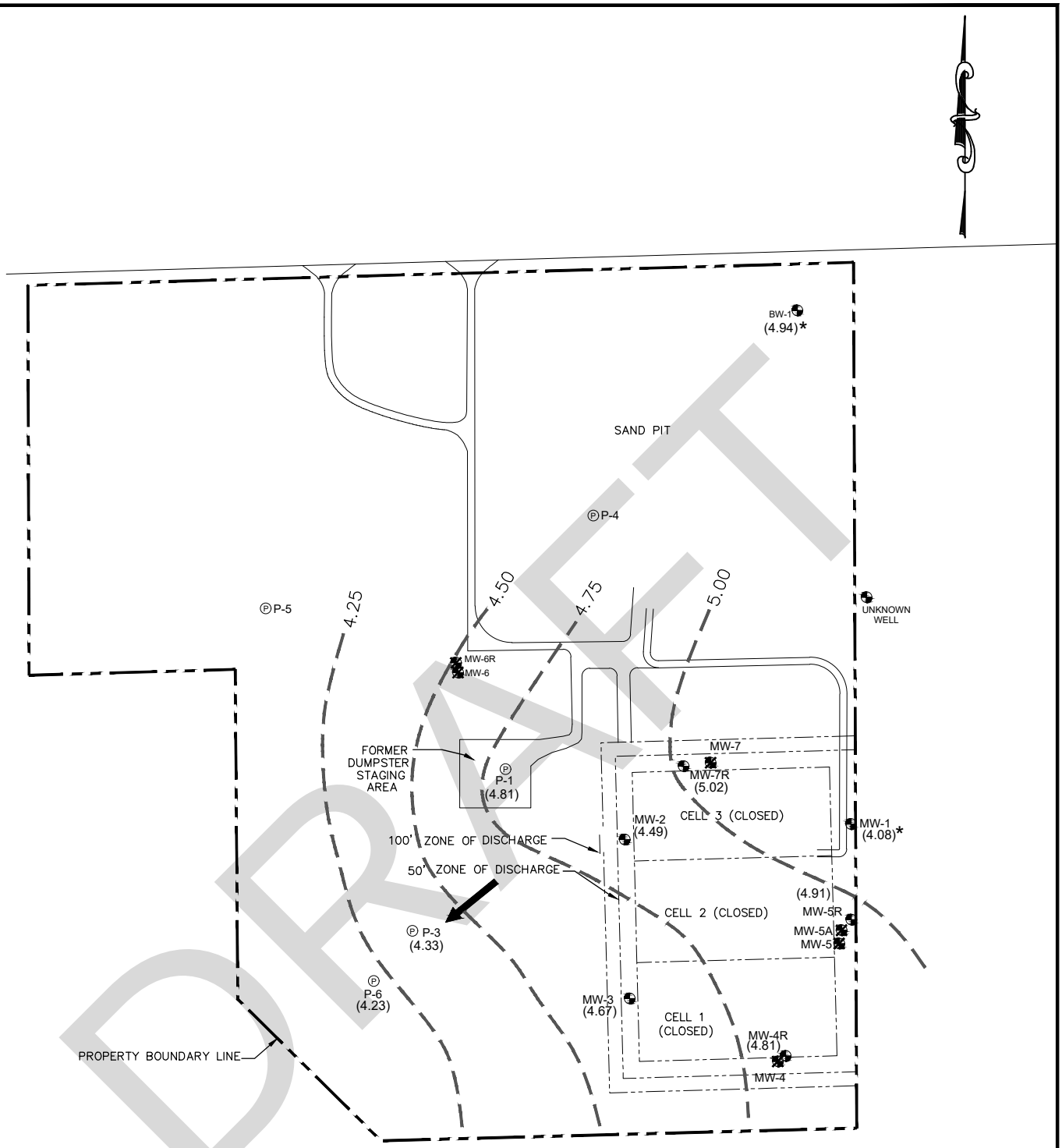
DRAWN BY: RC
CHECKED BY: YN
DATE: Jan 20

AECOM

1020 HOLLAND DRIVE, SUITE 104
BOCA RATON, FLORIDA 33487

Citrus Sand and Debris
1590 N. Quarterback Terr.
Crystal River, Florida

Figure: 2



LEGEND
- MONITORING WELL
- ABANDONED MONITORING WELL
- PIEZOMETER
- (4.23) GROUNDWATER ELEVATION, FEET
- * NOT USED IN CONTOURING
- GROUNDWATER FLOW DIRECTION

0 500
SCALE IN FEET

GROUNDWATER ELEVATION MAP
December 10, 2019

DRAWN BY: RC CHECKED BY: YN DATE: Jan 20	AECOM 1020 HOLLAND DRIVE, SUITE 104 BOCA RATON, FLORIDA 33487	**Citrus Sand and Debris** 1590 N. Quarterback Terr. Crystal River, Florida	Figure: 3

D:\Aecom\ F3 GW ELE 12-19 CS.dwg 01/05/20

TABLE 1
GROUNDWATER MONITORING WELL ANALYTICAL EXCEEDANCES SUMMARY

Facility Name **Citrus Sand & Debris I C&D Disposal Facility**
Address **1590 N. Quarterback Ter.**
City, State **Crystal River, FL**
WACS FAC # **40459**

			Field Paramaters				Leachate Indicator Parameters					Metal Parameters							
Sample						pH	Nitrogen	Chloride	Nitrate	Sulfate*	TDS*	Aluminum*	Arsenic*	Cadmium	Chromium	Iron*	Lead*	Sodium*	Mercury*
Location	Screen	Date	Depth to	Turbidity	Specific	Field	Ammonia												
	Interval		Water		Conduct.														
Units	ft		ft btoc	NTU	umhos/cm	SU	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Table I Target Level			---	20	---	6.5-8.5	2.8	250	10	250	500	200	10	5	100	300	15.00	160000	2
BW-1	60.1 - 85.1	4/23/2013	77.69	8.2	70	**6.0**	0.0073U	1.5 I	0.20 I	1.1 I	36	**265**	6.10U	1.10 U	4.50 U	134	1.60 U	1860	0.0230 U
		12/11/2013	76.42	**582**	65	**9.1**	0.096	70.1	6.68	**1560**	**520**	**1050**	4.00U	4.30	23.8	**354**	4.00 U	1290	0.220 U
		1/17/2014	76.88	**71.6**	52	**9.1**	NA	NA	NA	6.32	80	143	NA	NA	NA	NA	NA	NA	NA
		5/27/2014	76.89	**155**	56	**9.0**	0.044	1.62	0.300 U	13.50	82	**202**	4.00U	1.00 U	4.00 U	77.0	4.00 U	1440	0.220 U
		12/15/2014	76.41	**25.7**	55	**8.9**	0.0140U	2.09	0.300 U	0.989 I	20.0U	**353**	4.00U	1.00 U	4.00 U	183	4.00 U	1260	0.220 U
		5/19/2015	77.07	**423**	56	8.5	0.0140U	2.37	0.300 U	23.9	72.0	**530**	4.00U	1.00 U	4.00 U	**438**	4.00 U	1400	0.220 U
		12/9/2015	76.44	**67.1**	54	**9.0**	0.02 U	1.1 U	0.18 U	5.0 U	27	190 I	1.6U	0.24 U	2.6	61	3.2 U	NS	0.084 U
		6/13/2016	76.64	**36.7**	54	**8.9**	0.02 U	2.6 U	0.18 U	2.0 U	47	140 I	1.6 U	0.26 I	3.7	95 I	3.2 U	1600	0.084 U
		12/29/2016	77.05	**55**	50	8.3	0.020 U	2.7 I	0.079	2.5 U	49.0	**360**	5.0 U	0.50 U	25.0	**602**	5.0 U	1100	0.10 U
		6/14/2017	77.38**	12.7	47	**8.92**	0.020 U	2.8 I	0.11	2.5 U	19.0	102	5.0 U	0.50 U	10.3	136	5.0 U	1400	0.10 U
		12/12/2017	76.51	19.7	45	**8.57**	0.035 U	2.5 I	0.076	2.5 U	31.0	**255**	5.0 U	0.50 U	5.4	**401**	5.0 U	1130	0.10 U
		6/4/2018	76.75	9.28	37	7.14	0.035 U	2.5 U	0.086	2.5 U	24.0	190	5.0 U	0.50 U	2.5 U	115	5.0 U	1600	0.10 U
		12/11/2018	75.98	**30.6**	28	**9.15**	0.035 U	2.5 I	0.079	2.5 U	23.0	**679**	7.1 U	0.33 U	8.1	**419**	4.6 U	1000 I	0.10 U
		5/16/2019	76.91	12.7	47	**8.57**	0.035 U	2.7 I	0.093	2.5 U	44.0	135	7.1 U	0.33 U	2.2 I	98.0	4.6 U	1100 I	0.10 U
		12/10/2019	75.84	118	48	**9.00**	0.035 U	27 I	110	2.5 U	31	**3640**	7.1 U	.034 I	22.6	**2320.0**	4.6 U	1300 I	0.10 U
MW-3	44.1 - 54.1	4/23/2013	50.91	**21.3**	430	6.8	0.026	5.7	0.19 I	5.4	240	**718**	6.10U	1.10 U	4.50 U	**1450**	1.60 U	4420	0.0230 U
		12/11/2013	49.88	**25.5**	396	7.3	0.033	5.99	0.300 U	11.1	223	105	4.00U	1.00 U	4.00 U	**835**	4.00 U	3500	0.220 U
		5/27/2014	50.18	**72.5**	411	6.6	0.11	7.22	0.300 U	8.78	221	**265**	4.00U	1.00 U	4.00 U	**1920**	4.00 U	3760	0.220 U
		12/15/2014	49.71	**26.5**	405	7.4	0.0140U	7.63	0.657	4.17	148	**236**	4.00U	1.00 U	4.00 U	**709**	4.00 U	3710	0.220 U
		5/19/2015	50.32	**491**	375	7.2	0.0140U	10.4	0.300 U	26.30	226	**849**	4.00U	1.00 U	4.00 U	**1310**	4.00 U	3620	0.220 U
		12/9/2015	49.67	**29**	371	7.0	0.02 U	3.7 I	0.32	6.0 I	190	150 I	1.6U	1.0	2.3	300	3.2 U	NS	0.084 U
		6/13/2016	49.78	15.8	372	6.8	0.02 U	6.3	1.2	4.1 I	200	**830**	1.6 U	1.3	3.9	**1100**	3.2 U	4400	0.084 U
		12/29/2016	50.27	**40.4**	387	7.0	0.020 U	6.9	0.17	4.2 I	240	**759**	5.0 U	0.69 I	15.1	**1920**	5.0 U	4400	0.10 U
		6/14/2017	50.55**	18.2	405	**8.80**	0.020 U	6.9	0.25	4.2 I	210	50.0 U	5.0 U	0.50 U	4.1 I	**620**	5.0 U	4500	0.10 U
		12/12/2017	49.77	**22.7**	393	6.54	0.035 U	6.6	0.27	4.1 I	240	**380**	5.0 U	0.76 I	15.8	**1040**	5.0 U	4570	0.10 U
		6/4/2018	49.93	6.92	384	7.13	0.035 U	7	0.23	3.7 I	255	59.8 I	5.0 U	0.50 U	2.5 U	**724**	5.0 U	4100	0.10 U
		12/11/2018	49.2	-	-	-	0.17 U	6.9	0.38	4.4 I	242	**44900**	7.1 U	**16.6**	**259**	**23200**	**40.70**	3700	0.70
		1/21/2019	49.08	1.75	393	**6.17**	0.035 U	6.4	0.3	3.9 I	210	30.7 U	7.1 U	0.56	1.7 U	49.6	4.6 U	4.3	0.10 U
		5/16/2019	49.6	15.8	381	6.86	0.035 U	6.8	0.34	4.3 I	210	193	7.1 U	0.75 I	2.3 I	288	4.6 U	4200	0.10 U
		12/10/2019	49.07	15.1	385	7.3	0.035 U	7.3	0.23	5.8	260	**35100**	7.1 U	**10.1**	**656**	**22900**	**34.40**	4600	0.30 I

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TABLE 1
GROUNDWATER MONITORING WELL ANALYTICAL EXCEEDANCES SUMMARY

Facility Name **Citrus Sand & Debris I C&D Disposal Facility**
Address **1590 N. Quarterback Ter.**
City, State **Crystal River, FL**
WACS FAC # **40459**

			Field Paramaters				Leachate Indicator Parameters					Metal Parameters							
Sample						pH	Nitrogen	Chloride	Nitrate	Sulfate*	TDS*	Aluminum*	Arsenic*	Cadmium	Chromium	Iron*	Lead*	Sodium*	Mercury*
Location	Screen	Date	Depth to	Turbidity	Specific	Field	Ammonia												
	Interval		Water		Conduct.														
Units	ft		ft btoc	NTU	umhos/cm	SU	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Table I Target Level			---	20	---	6.5-8.5	2.8	250	10	250	500	200	10	5	100	300	15.00	160000	2
MW-4R	56.3 - 66.3	4/23/2013	60.67	2.2	936	**6.4**	**3.0**	3.2 I	0.052 U	0.39 I	470	68U	6.10U	1.10 U	4.50 U	**13200**	1.60 U	18100	0.0230 U
		12/11/2013	59.78	10.9	910	6.6	1.6	6.1	0.300 U	8.76	**501**	10.0 U	4.00U	1.00 U	4.00 U	**9620**	4.00 U	12000	0.220 U
		5/27/2014	59.96	6.9	922	**6.3**	**6.1**	4.87	0.300 U	10.3	**523**	10.0U	4.00U	1.00 U	4.00 U	**9650**	4.00 U	11400	0.220 U
		12/15/2014	59.44	5.5	960	6.7	**6.38**	7.29	0.300 U	1.18	430	10.0U	**13.5**	1.00 U	4.00 U	**10900**	4.00 U	9510	0.220 U
		5/19/2015	60.03	9.3	923	**6.2**	**10.5**	3.66	0.300 U	1.75	**504**	10.0U	4.00U	1.00 U	4.00 U	**8700**	4.00 U	8430	0.220 U
		12/9/2015	59.35	4.8	981	**6.2**	**14**	1.9 I	0.18 U	5.0 U	450	120 U	5.2 I	0.38 I	0.92 I	**9800**	3.2 U	NS	0.084 U
		6/13/2016	59.63	11.7	956	**6.4**	**15**	3.8 I	0.18 U	2.0 U	460	120 U	1.6 U	0.41 I	**160**	**10000**	3.2 U	9900	0.084 U
		10/5/2016	59.24	7.3	1030	6.5	NA	NA	NA	NA	460	80 U	2.1 U	0.50 U	2.5 U	**8600**	1.1 U	9600	0.084 U
		12/29/2016	60.13	8.3	961	6.5	**27.1**	3.9 I	0.020 U	2.5 U	428	50.0 U	5.0 U	0.50 U	2.5 U	**9380**	5.0 U	9600	0.10 U
		6/14/2017	60.41**	18.2	1000	6.22	**28.6**	3.7 I	0.075 U	2.5 U	418	50.0 U	5.0 U	0.50 U	4.7 I	**9480**	5.0 U	9230	0.10 U
		12/12/2017	59.6	14.2	1035	**6.29**	**37.5**	3.5 I	0	2.5 U	384	50.0 U	5.0 U	0.50 U	2.5 U	**10000**	5.0 U	9780	0.10 U
		6/4/2018	59.8	6.1	937	6.60	**35.4**	2.8 I	0.025 U	2.5 U	462	50.0 U	5.0 U	0.50 U	2.5 U	**10400**	5.0 U	9500	0.10 U
		12/11/2018	59.03	8.7	1016	6.50	**31.0**	3.7 I	0.048 I	2.5 U	466	41.2 I	7.1 U	0.33 U	2.0 I	**10600**	4.6 U	9100	0.10 U
		5/16/2019	59.52	5.1	906	6.52	**20.7**	3.9 I	0.057	2.5 U	427	59.6 I	7.3 I	0.33 U	1.7 U	**10300**	4.6 U	8000	0.10 U
		12/10/2019	58.91	6.7	976	6.60	**19.4**	3.7 I	0.082	2.5 U	436	30.7 U	7.1 U	0.33 U	1.7 U	**11300**	4.6 U	6700	0.10 U
MW-5R	62.1 - 72.1	4/23/2013	66.05	1.0	484	6.7	1.8	3.2 I	1.80	0.33 I	190	68U	6.10U	1.10 U	4.75 I	**1310**	1.60 U	2130	0.0230 U
		12/11/2013	65.14	10.8	464	7.0	0.80	4.90	0.300 U	6.86	239	114	4.00U	1.00 U	4.00 U	**2090**	4.00 U	3360	0.220 U
		5/27/2014	65.35	**20.6**	448	6.7	0.97	4.85	0.300 U	5.66	231	104	4.00U	1.00 U	4.00 U	**2020**	4.00 U	3070	0.220 U
		12/15/2014	64.84	**358**	472	7.2	0.8490	6.44	0.300 U	1.43	226	**506**	4.00U	1.00 U	4.00 U	**2470**	4.00 U	3060	0.220 U
		5/19/2015	65.41	**30**	404	**6.1**	0.3730	4.24	0.300 U	2.83	224	41.8	4.00U	1.00 U	13.2	**1400**	4.00 U	2800	0.220 U
		12/9/2015	64.74	**23.6**	512	6.8	1.3	2.9 I	0.18 U	5.0 U	240	120 I	3.3 I	0.24 U	2.8	**2900**	3.2 U	NS	0.084 U
		6/13/2016	64.94	4.5	434	6.7	0.63	4.8 I	0.18 U	2.0 I	230	120 U	1.6 U	0.24 U	3.2	**1900**	5.2 I	3600	0.084 U
		12/29/2016	65.41	15.4	415	6.9	1.2	5.5	0.020 U	2.5 U	227	165	5.0 U	0.50 U	3.6 I	**2390**	5.0 U	3600	0.10 U
		6/14/2017	65.70**	16.4	395	**10.69**	0.5	5.4	0.025 U	2.8 I	198	50.0 U	5.0 U	0.50 U	2.6 I	**1420**	5.0 U	3090	0.10 U
		12/12/2017	64.91	15.4	482	6.81	0.58	5.3	0.028 I	3.5 I	246	50.0 U	5.0 U	0.50 U	2.5 U	**1910**	5.0 U	3760	0.10 U
		6/4/2018	65.08	7.6	415	7.19	0.31	5.5	0.025 U	2.5 U	230	117	5.0 U	0.50 U	2.5 U	**1580**	5.0 U	3300	0.10 U
		12/11/2018	64.37	8.4	571	6.78	1.30	5.6	0.026 I	2.5 U	311	78.2 I	7.1 U	0.33 U	1.7 U	**4030**	4.6 U	4200	0.10 U
		5/16/2019	64.79	11.2	525	7.28	1.20	5.6	0.028 I	2.5 U	288	103	7.1 U	0.33 U	1.7 U	**3160**	4.6 U	3800	0.10 U
		12/10/2019	64.22	5.0	644	6.80	2.1	5.5	0.092	2.8 I	312	**292**	7.1 U	0.33 U	12.7	**5840**	4.6 U	4700	0.10 U

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TABLE 1
GROUNDWATER MONITORING WELL ANALYTICAL EXCEEDANCES SUMMARY

Facility Name **Citrus Sand & Debris I C&D Disposal Facility**
Address **1590 N. Quarterback Ter.**
City, State **Crystal River, FL**
WACS FAC # **40459**

			Field Paramaters				Leachate Indicator Parameters					Metal Parameters							
Sample						pH	Nitrogen	Chloride	Nitrate	Sulfate*	TDS*	Aluminum*	Arsenic*	Cadmium	Chromium	Iron*	Lead*	Sodium*	Mercury*
Location	Screen	Date	Depth to	Turbidity	Specific	Field	Ammonia												
	Interval		Water		Conduct.														
Units	ft		ft btoc	NTU	umhos/cm	SU	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Table I Target Level			---	20	---	6.5-8.5	2.8	250	10	250	500	200	10	5	100	300	15.00	160000	2
MW-7	47.8 - 62.8	4/23/2013	49.41	0.7	645	6.8	0.0073U	6.6	0.63 I	33.0	380	68U	6.10U	1.10 U	10.6	129	1.60 U	9190	0.0230 U
		12/11/2013	Could not be located, assumed destroyed																
		5/27/2014	Could not be located, assumed destroyed																
		12/15/2014	Could not be located, assumed destroyed																
		5/19/2015	Could not be located, assumed destroyed																
		12/9/2015	Could not be located, assumed destroyed																
MW-7R	45 - 60	6/15/2016	53.40	Replacement MW-7R installed on 06/15/2016															
		7/22/2016	50.70	9.2	248	**4.9**	0.31	8.2	0.18 U	28	140	**250 I**	2.0 I	0.93	1.1 I,V	**12000**	3.2 U	7500	0.11
		10/5/2016	50.05	12.6	194	**5.7**	NA	NA	NA	NA	98	**510**	2.1 U	0.50 U	2.5 U	**8200**	1.1 U	7700	0.084 U
		12/29/2016	51.00	4.2	165	**5.0**	0.088	7.4	0.020 U	14.3	117	**258**	5.0 U	0.96 I	2.5 U	**13700**	5.0 U	8300	0.10 U
		6/14/2017	51.35**	6.21	198	**10.01**	0.058	7.2	0.050 U	10.7	42.0	85.9 I	5.0 U	0.57 I	2.5 U	**10100**	5.0 U	8280	0.10 U
		12/12/2017	50.44	8.21	151	**4.92**	0.21	7.4	0.130	3.8 I	85.0	97.9 I	5.0 U	0.50 U	2.5 U	**9830**	5.0 U	8000	0.10 U
		6/4/2018	50.64	8.42	165	**5.1**	0.24	8.4	0.067	4.8 I	70.0	**445**	5.0 U	0.50 U	9.4	**11000**	5.0 U	8000	0.12 I
		12/11/2018	49.94	11.9	213	**5.5**	0.2	8.4	0.066	9.2	106	**1890**	**14.8**	1.4	**115**	**24300**	4.6 U	8100	0.13 I
		1/21/2019	52.02	2.71	188	**4.77**	0.16	7.4	0.10	5.9	103	91.2 I	**12.2**	0.33	1.7 U	**16900**	4.6 U	8.1	0.1
		5/16/2019	50.33	4.29	152.1	**5.14**	0.098	7.9	0.110	6.1	97	113	**15.5**	0.33 U	1.7 U	**15500**	4.6 U	7800	0.10 U
		12/10/2019	49.76	6.29	188	**5.36**	35 U	7.8	0.11	7.3	103	**221**	7.1 U	0.33 U	3.0 I	**19700**	4.6 U	8000	0.10 I

NOTES:

Only laboratory constituents in which exceedances were detected are shown, all other values within Groundwater Cleanup Target Levels (GCTLs)
milligrams per liter (mg/l); micrograms per liter (ug/l); SU = Standard Units; "U" denotes analyte not detected above MDL.
Nephololmetric Technical Units (NTU); micromhos per centimeter (umhos/cm)
Table I refers to Table I, Groundwater and Surface Water Target Levels (Groundwater Criteria) of FDEP Chapter 62-777 F.A.C.
Table V refers to Table V, Natural Attenuation Default Concentrations (Source) of FDEP Chapter 62-777 F.A.C.
Laboratory qualifier "I" denotes analyte was detected below quantitation limits. V = Analyte detected in the associated Method Blank
TDS = Total Dissovled Solids, included as reference
* = as provided in Chapter 62-520, FAC
** = DTW measurements were taken on 5/24/17 from MW-1, MW-2, MW-3, MW-4R, MW-5R, MW-7R, BW-1, P-1, P-3 and P-6.
NA = Not Analyzed
'Drinking Water Standards, Monitoring and Reporting 62-550 Tables
No field parameters reported for MW-3R as samples were collected using a bailer

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TABLE 2: GROUNDWATER ELEVATION TABLE

Facility Name: **Citrus Sand & Debris I C&D Disposal Facility**
Address **1590 N. Quarterback Ter., Crystal River, FL**
WACS Facility ID#: **40459**

All Measurements = Feet
No Data = Blank

WELL NO.	BW-1			MW-1			MW-2			MW-3			MW-4R			MW-5R			MW-7			MW-7R		
DIAMETER	2"			2"			2"			2"			2"			2"			2"			2"		
TOTAL WELL DEPTH	85.08			93.33			53.25			54.06			66.29			72.10			62.83 BLS			65 BTOC		
SCREEN LENGTH	15			10			10			10			10			10			15			15		
SCREEN INTERVAL	70.08 - 85.08			83.33 - 93.33			43.25 - 53.25			44.06 - 54.06			56.29 - 66.29			62.10 - 72.10			47.83 - 62.83 BLS			50 - 65 BTOC		
TOC ELEVATION	80.78			89.07			52.46			53.74			63.72			69.13			52.59			54.78		
Well Screen Eleva.																								
TOP (ft, NGVD)	8.3			6.3			8.7			8.5			6.5			6.1			2.4			4.8		
BOTTOM (ft, NGVD)	-6.7			-3.7			-1.3			-1.5			-3.5			-3.9			-12.6			-10.2		
DATE	ELEV	DTW	Diff	ELEV	DTW	Diff	ELEV	DTW	Diff	ELEV	DTW	Diff	ELEV	DTW	Diff	ELEV	DTW	Diff	ELEV	DTW	Diff	ELEV	DTW	Diff
4/23/2013	3.09	77.69	0.74	3.19	85.88	0.73	3.61	48.85	0.17	2.83	50.91	0.72	3.05	60.67	0.74	3.08	66.05	0.76	**3.18**	49.41	0.99			
11/20/2013	4.48	76.30	-1.39										4.17	59.55	-1.12				Not Located					
12/11/2013	4.36	76.42	0.12	4.08	84.99	-0.89	Not Located			3.86	49.88	-1.03	3.94	59.78	0.23	3.99	65.14	-0.91	Not Located					
1/17/2014	3.90	76.88	0.46																Not Located					
4/9/2014				4.15	84.92	-0.07	5.65	46.81	-2.04	3.83	49.91	0.03				3.62	65.51	0.37	Not Located					
5/27/2014	3.89	76.89	0.01	3.86	85.21	0.29	5.82	46.64	-0.17	3.56	50.18	0.27	3.76	59.96	0.18	3.78	65.35	-0.16	Not Located					
12/15/2014	4.37	76.41	-0.48	4.36	84.71	-0.50	5.98	46.48	-0.16	4.03	49.71	-0.47	4.28	59.44	-0.52	4.29	64.84	-0.51	Not Located					
5/19/2015	3.71	77.07	0.66	3.80	85.27	0.56	4.86	47.60	1.12	3.42	50.32	0.61	3.69	60.03	0.59	3.72	65.41	0.57	Assumed Destroyed					
12/9/2015	4.34	76.44	-0.63	4.47	84.60	-0.67	5.93	46.53	-1.07	4.07	49.67	-0.65	4.37	59.35	-0.68	4.39	64.74	-0.67						
6/13/2016	4.14	76.64	0.20	3.35	85.72	1.12	3.58	48.88	2.35	3.96	49.78	0.11	4.09	59.63	0.28	4.19	64.94	0.20						
7/22/2016																						4.08	50.70	
10/5/2016													4.48	59.24	-0.39							4.73	50.05	-0.65
12/29/2016	3.73	77.05	0.41	2.87	86.20	0.48	3.12	49.34	0.46	3.47	50.27	0.49	3.59	60.13	0.89	3.72	65.41	0.47				3.78	51.00	0.95
5/24/2017	0.46	80.32	3.27	2.59	86.48	0.28	2.08	50.38	1.04	3.22	50.52	0.25	3.34	60.38	0.25	3.43	65.70	0.29				3.40	51.38	0.38
6/14/2017	3.40	77.38	-2.94							3.19	50.55	0.03	3.31	60.41	0.03	3.43	65.70	0.00				3.43	51.35	-0.03
12/12/2017	4.27	76.51	-0.87	3.41	85.66	-0.54	3.69	48.77	0.46	3.97	49.77	-0.75	4.12	59.60	-0.78	4.22	64.91	-0.79				4.34	50.44	-0.94
6/4/2018	4.03	76.75	0.24	3.19	85.88	0.22	2.86	49.60	0.83	3.81	49.93	0.16	3.92	59.80	0.20	4.05	65.08	0.17				4.14	50.64	0.20
12/10/2018	4.80	75.98	-0.77	3.94	85.13	-0.75	4.11	48.35	-1.25	4.54	49.20	-0.73	4.69	59.03	-0.77	4.76	64.37	-0.71				4.84	49.94	-0.70
1/21/2019										4.66	49.08	-0.85										2.76	52.02	1.38
5/16/2019	3.87	76.91	0.93	3.48	85.59	0.46	3.49	48.97	0.62	4.14	49.60	0.40	4.20	59.52	0.49	4.34	64.79	0.42				4.45	50.33	0.39
12/10/2019	4.94	75.84	-1.07	4.08	84.99	-0.60	4.49	47.97	-1.00	4.67	49.07	-0.53	4.81	58.91	-0.61	4.91	64.22	-0.57				5.02	49.76	-0.57

Notes: ELEV = Groundwater elevation (TOC Elevation minus DTW) DTW = Depth to Water Diff = DTW change between screening events

BTOC = Below Top Of Casing

Notes 1 to 3 based on 05/07/13 NOVA Env. Serv., Inc Report

1. Boldface type = ground water above the monitoring well top of screen.
2. Monitoring well screen intervals were revised 12/2/08 to reflect data by others as shown in solid waste permit issued 7/3/08.
3. The casing on Monitoring Well MW-3 was raised and re-surveyed in January 2009.
4. Replacement MW-7R installed on 06/15/2016
5. Groundwater samples were collected on 6/14/17 (Jun-17)

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TABLE 2: GROUNDWATER ELEVATION TABLE

Facility Name: Citrus Sand & Debris I C&D Disposal Facility
Address 1590 N. Quarterback Ter., Crystal River, FL
WACS Facility ID#: 40459

All Measurements = Feet
No Data = Blank

WELL NO.	P-1			P-3			P-4			P-5			P-6		
DIAMETER	2"			1"			2"			2"			2"		
TOTAL WELL DEPTH	60.01			44.48			46.57			56.16			37.62		
SCREEN LENGTH	10			10			10			10			10		
SCREEN INTERVAL	50.01 - 60.01			34.48 - 44.48			36.57 - 46.57			46.16 - 56.16			27.62 - 37.62		
TOC ELEVATION	46.01			36.78			41.17			53.76			35.72		
Well Screen Eleva.															
TOP (ft, NGVD)	-4.0			2.3			4.6			7.6			8.1		
BOTTOM (ft, NGVD)	-14.0			-7.7			-5.4			-2.4			-1.9		
DATE	**ELEV**	**DTW**	**Diff**	**ELEV**	**DTW**	**Diff**	**ELEV**	**DTW**	**Diff**	**ELEV**	**DTW**	**Diff**	**ELEV**	**DTW**	**Diff**
4/23/2013	**3.00**	**43.01**	0.74	**2.33**	**34.45**	0.75	2.17	39.00	0.73	2.11	51.65	0.85	2.28	33.44	0.80
11/20/2013															
12/11/2013	**3.94**	**42.07**	-0.94	**3.43**	**33.35**	-1.10	Not Located			Not Located			3.32	32.40	-1.04
1/17/2014															
4/9/2014															
5/27/2014	**3.78**	42.23	0.16	**3.34**	33.44	0.09	Not Located			Not Located			3.17	32.55	0.15
12/15/2014	**4.18**	41.83	-0.40		Broken		Not Located			Not Located			3.57	32.15	-0.40
5/19/2015	**3.59**	42.42	0.59	**3.08**	33.70	0.26	Not Located			Not Located			3.01	32.71	0.56
12/9/2015	**4.30**	41.71	-0.71	-4.44	41.22	7.52	Not Located			Not Located			3.70	32.02	-0.69
6/13/2016	**4.15**	41.86	0.15	-4.47	41.25	0.03	Not Located			Not Located			-0.45	36.17	4.15
10/5/2016				**4.25**	32.53	-8.72							3.91	31.81	-4.36
12/29/2016	**3.69**	42.32	0.46	**3.21**	33.57	1.04							3.10	32.62	0.81
5/24/2017	3.33	42.68	0.36	2.81	33.97	0.40							2.79	32.93	0.31
12/12/2017	4.10	41.91	0.46	3.71	33.07	9.76							3.52	32.20	5.17
6/4/2018	3.90	42.11	0.20	3.55	33.23	0.16							3.35	32.37	0.17
12/10/2018	4.68	41.33	-0.78	4.10	32.68	-0.55							4.08	31.64	-0.73
1/21/2019															
5/16/2019	4.23	41.78	0.45	3.73	33.05	0.37							3.64	32.08	0.44
12/10/2019	4.81	41.20	-0.58	4.33	32.45	-0.60							4.23	31.49	-0.59

Notes:

ELEV = Groundwater elevation (TOC Elevation minus DTW)
Notes 1 to 3 based on 05/07/13 NOVA Env. Serv., Inc Report
1. Boldface type = ground water above the monitoring well top of screen.
2. Monitoring well screen intervals were revised 12/2/08 to reflect data by others as shown in solid waste permit issued 7/3/08.
3. The casing on Monitoring Well MW-3 was raised and re-surveyed in January 2009.

DTW = Depth to Water
Diff = DTW change between screening events

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APPENDIX I

Cultural Resource Assessment

AVAILABLE UPON REQUEST

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APPENDIX J

Correspondence

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Date: December 16, 2019

From: Troy Vargas, P.E., Project Manager

Subject: **Suncoast Parkway 2 – From S.R. 44 to C.R. 486 – FPID 442764-1**
Drainage Kick-Off Meeting on Thursday, December 5, 2019 – 3:00 P.M.
Meeting Minutes

To Meeting Attendees:

Erin Yao	FTE	**Chuck Smith**	DRMP
Adriana Kirwan	FTE	**Christine Crespo Valentin**	WGI
Annemarie Hammond	FTE	**Derek Burke**	WBQ
Tiffany Crosby	FTE	**Troy Vargas**	WBQ
Daniel Kastelic	FTE	**Scott Stewart**	WBQ
Yang Zhow	HNTB/FTE	**Haley Thomas**	WBQ

I. Introductions

II. Project Overview
   A. Existing Permits
      i. The entire Suncoast Parkway 2 permit application was submitted to the Southwest Florida Water Management District (SWFWMD); however, the permit application was withdrawn, and the project was permitted in separate segments. As for this segment, there is no permit existing permit.
         a. Based on the previously permit application, the pond sites will be the generally the same but are going to be modified slightly due to the revised alignment and changes onsite conditions and design criteria.

III. Schedule
   A. Pond Siting Report is scheduled to be submitted in early February 2020.
   B. 45% Drainage and Storm Water meeting will be scheduled for November 2020.
   C. SWFWMD Pre-App meeting is scheduled for September 2020
      i. FTE recommends the WBQ staff review RAI's from the previous permit submittal and confirm that all comments/concerns have been addressed.
      ii. The Pre-App meeting can be scheduled early June 2020, if necessary.

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D. Final PSR will be submitted with 45% submittal at the end of October 2020.

IV. Design Criteria

A. 2020 FDOT Drainage Manual and TDH Drainage Supplement.
B. 2020 Turnpike Criteria should be coming out in January 2020.
C. Will need to coordinate with Citrus County for the realignment of the local roads (i.e. Knoll Road).
D. FTE gave the WBQ staff an update on the status of the Bachschmidt Property
    i. Developer was just given a permit after adding the required pond.
        a. Was previously fined and required to stop work.
    ii. The site will most likely be continually changing.
        a. Keep this in mind for potential pond site locations.

V. Drainage Design Approach

A. Closed Basin Criteria
    i. FDOT and SWFWMD criteria will be followed.
B. Currently anticipating all dry ponds.
    i. Ponds to be sized for the ultimate 8-lane condition.
C. Treatment
    i. First inch of rainfall or first ½ inch if basin is less than 100 AC.
D. Homosassa River Basin Model from SWFWMD (2014)
E. No designated floodplains within project limits.
    i. Historic basin storage will be analyzed, and compensation provided as necessary.
F. Wetlands
    i. SWFWMD Formal Jurisdictional Wetland was approved in 2008 for the two existing small wetlands. These wetlands will be verified during the field surveys.
    ii. There are no USACE jurisdictional wetlands within the project area.
G. Protected Species
    i. Gopher tortoise burrow were observed in the proposed pond sites. A FWC gopher tortoise relocation permit is anticipated.
    ii. A meeting with United States Fish and Wildlife Service will be conducted on December 12, 2019, for discuss regarding eastern indigo snake and Florida scrub jays within the corridor.
    iii. There will be no wildlife crossings proposed.
H. Base clearance will be verified as ditch calculations are run, but there are no issues anticipated.

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I. Open collection system will convey to proposed treatment ponds
J. Basins will match the name format used in 2008 as much as possible.

VI. Permitting
A. FDEP
i. Do not mix drainage/environmental with utility FDEP permits.
B. SWFMD individual environmental resource permit application will be required
C. No USACE permit application will be required.

VII. Other Items
A. The project to the south has utilized the Green-Ampt Method
i. Our team has not found any criteria that stipulated this method
a. Erin thought they were using that to take advantage of the modeling that would potentially reduce pond sites area.
b. This may be the method the District used in the Basin Model.
c. WBQ will continue research and utilize a conservative approach until criteria is confirmed.
B. WBQ researched the permit application that was previously withdrawn, but documentation was not available on SWFWMD permitting site.
C. Right of Way
i. Ponds will be sized in order to provide the worst-case scenario for Right of Way impacts/acquisitions.
D. Joint Use Ponds
i. Coordinate with FDOT District 7 drainage staff for joint use opportunities along SR 44.
E. Pond Shapes/Landscaping
i. Final pond design and grading to include curvilinear pond forms and up to 10% of pond site to be set aside for Landscape.
ii. Landscape projects are to be installed as a stand-alone project at a later date.

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VIII. Action Items

Item No.	Action Item Description	Responsible Party
1	Follow up with FTE if Turnpike Criteria is not out by end of January 2020.	WBQ
2	Contamination for landfill cells will be coordinated with other FTE staff (Eric Krebill and Philip Stein).	WBQ
3	WBQ will reach out to District 7 on joint use pond opportunities and will copy the FTE staff.	WBQ

The preceding is the author's interpretation of the substantive points of the meeting and shall serve as a record of the items discussed. Please send clarifications or revisions to the author's attention within seven (7) days.

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Date: May 11, 2020

From: Troy Vargas, P.E., Project Manager

Subject: **Suncoast Parkway 2 – From S.R. 44 to C.R. 486 – FPID 442764-1-FTE – D7 Coordination Meeting**
GoToMeeting Held on Wednesday, May 06, 2020 – 3:00 P.M.
Meeting Minutes

To Meeting Attendees:

Francisco Cardona*	FTE	**Tom Neyer***	FTE
Adriana Kirwan*	FTE	**Erin Yao***	FTE
Abdul Waris*	D7	**Derek Burke***	WBQ
Anthony Celani*	D7	**Troy Vargas***	WBQ
Daniel Lauricello*	D7	**Scott Stewart***	WBQ
Tracy Hood*	D7	**Haley Thomas***	WBQ
Francis DeLaRosa*	FTE	**Chris Lancaster***	WBQ
Stephanie Sharp*	FTE		

** All Attendees Participated by Phone*

I. Introductions

II. Project Overview

III. Proposed Concept

A. WBQ received Line and Grade Submittal comments.
   i. Typical Section Package – Comment received to add D7 Concurrence.
      a. Allen Urbonas from FTE D7 staff, will sign the typical section package for SR 44.

IV. Pond Siting Report

A. The Draft Pond Siting Report was submitted.
B. District 7 Drainage staff checked to see if there are any future improvements and there are currently no future improvements.
C. WBQ is impacting an existing District 7 stormwater pond on the north side of SR 44.
   i. WBQ discussed the opportunity for joint use or replacement ponds, and District 7 Drainage staff was open to working together on this topic.
      a. District 7 maintenance would like to eliminate further maintenance on the pond.

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V. Public Involvement

A. Public Meeting took place January 23, 2020.
B. Public Hearing currently scheduled for July 2020.
    i. Final date and time are still to be determined and may be subject to change due to COVID-19.

VI. Upcoming Submittals

A. WBQ will submit 30% plans at the end of July 2020.
B. District 7 requested that Anthony Celani be added to the ERC as a reviewer.

VII. Other Items

A. Duke Energy requested a new driveway access on SR 44 to their Right of Way.
    i. Utility Access Easement will be provided adjacent to proposed pond site.
B. D7 requested additional information regarding DMS or ITS if there are any proposed improvements as part of this project.

VIII. Action Items

Item No.	Action Item Description	Responsible Party
1	Reach out if any additional reviewers need to be added to ERC.	D7
2	Verify if Phase 1 has DMS on side streets.	FTE
3	Add Anthony Celani as a reviewer for D7 Drainage.	FTE

The preceding is the author's interpretation of the substantive points of the meeting and shall serve as a record of the items discussed. Please send clarifications or revisions to the author's attention within seven (7) days.

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Date: May 11, 2020

From: Troy Vargas, P.E., Project Manager

Subject: **Suncoast Parkway 2 – From S.R. 44 to C.R. 486 – FPID 442764-1**
Citrus County Coordination Meeting on Thursday, May 8, 2020 – 3:00 P.M.
Meeting Minutes

To Meeting Attendees:

Walt Eastmond*	Citrus County	**Derek Burke***	WBQ
Randall Olney*	Citrus County	**Troy Vargas***	WBQ
Francisco Cardona*	FTE	**Scott Stewart***	WBQ
Chad Marcus*	FTE	**Christopher Lancaster***	WBQ
Francis DeLaRosa*	FTE	**Danny Williams***	WBQ Survey
Kelly H. Barnes*	FTE	**Hank Hanson***	WBQ Survey
		Darrell Andrews*	WBQ Survey

** All Attendees Participated by Phone*

I. Introductions

II. Project Overview

A. WBQ reviewed the project limits for the overall Suncoast Parkway 2.
B. Suncoast Parkway 2 - Phase 3, from CR 486 to US 19 is on hold.

III. Proposed Concept

A. The Interchange layout at CR 486 was reviewed.
B. Revised typical section package will be submitted to Turnpike next week, with Line & Grade comments incorporated.
   i. Randell Olney will sign the typical section for Citrus County concurrence of the proposed County road improvements.
C. The proposed bridge crossings at Sanction Road is designed to accommodate the future four lane widening.

IV. Line & Grade

A. Citrus County Comments and responses have been accepted.

V. Local Roads

A. Local roads were reviewed and discussed with Citrus County.
B. Exiting Knoll Road, Ziggy Street, Sanction Road, connections to Maylen Avenue, and North Hakik Path will remain private roads
C. West Lee Ann Lane will remain open as requested by Seven Rivers Church.

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D. The team will need to consider improvements on the private unpaved roads.
    i. Homeowners/Landowners have stated that they want improvements on the private roads.
    ii. Design team will likely match the existing pavement; unpaved roads will remain unpaved.

VI. New Access Roads

A. Knoll Road Realignment will be Citrus County right of way.

VII. Public Involvement

A. The Public Hearing is tentatively scheduled for July 7, 2020.

VIII. Memorandum of Agreement (MOA)

A. MOA exhibits were provided as part of the Line & Grade submittal.
    i. WBQ will revise the exhibits to show private roads remaining private.

IX. Utility Coordination

A. Citrus County would like to add utilities within the multi-use path Right of Way.
    i. Citrus County would like to have a new waterline and force mains.
    ii. WBQ will coordinate further after the 30% plan submittal.

X. Other Items

A. Walt Eastmond asked for shared stormwater facilities for the landfill site.
    i. WBQ confirmed that they are looking into joint use ponds.
        a. Ponds will take into account Citrus County future developments on the Rook's Property
    ii. The design team will coordinate with Citrus County staff on the joint use ponds, new utilities, and paving privately owned roads.
B. Easements and mapping requirements will be coordinated after the 30% plans are completed.

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XI. Action Items

Item No.	Action Item Description	Responsible Party
1	WBQ will follow up with Citrus County utilities.	**WBQ**
2	Coordinate with Citrus County staff on the joint use pond, new utilities and paving privately owned roads.	**WBQ**

The preceding is the author's interpretation of the substantive points of the meeting and shall serve as a record of the items discussed. Please send clarifications or revisions to the author's attention within seven (7) days.

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Date: June 18, 2020

From: Troy Vargas, P.E., Project Manager

Subject: **Suncoast Parkway 2 – From S.R. 44 to C.R. 486 – FPID 442764-1**
SWFWMD Pre-App Meeting – Thursday, June 10, 2020 – 3:00 P.M.
Meeting Minutes

To Meeting Attendees:

Francisco Cardona*	FTE	**Scott VanOrsdale***	SWFWMD
Tiffany Crosby*	FTE	**Lauren Greenawalt***	SWFWMD
Adriana Kirwan*	FTE	**Frank Gargano***	SWFWMD
Annemarie Hammond*	FTE	**Derek Burke***	WBQ
Eric Krebill*	FTE	**Troy Vargas***	WBQ
Erin Yao*	FTE	**Scott Stewart***	WBQ
George McLatchey*	DRMP	**Haley Thomas***	WBQ
Logan Shappell*	DRMP	**David Herman***	WBQ

** All Attendees Participated by Phone*

I. Introductions

II. Project Overview

A. Phase 1 ERP

B. Phase 2 - Approximately 2 miles extending Phase 1 from SR 44 to CR 486.

i. There are the same site conditions as Phase 1, but no state lands in this segment.

ii. Existing PD&E is being reevaluated to include access to CR 486.

iii. The area is high and dry with minimal to no wetland impacts.

iv. The overall list of protected species is minimal.

v. Utilizing the same general typical section as Phase 1.

III. Drainage

A. Proposed Approach

i. Roll plot shows all potential pond sites that are in the Pond Siting Report.

ii. Design Storm criteria was reviewed.

iii. Closed basins with dry ponds. Current approach is to contain entire 100-year 24-hour storm within the ponds. Design team is aware that SWFWMD has modeled this area.

a. SWFWMD will provide points of contact for technical questions for basin modeling.

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            i. Nam Nguyen is the PM for watershed modeling.
            ii. SWFWMD showed the GIS Map they have prepared to confirm isolated closed basins.
        iv. Although Crystal River basin is impaired, this criteria will not impact the proposed design if no discharge is anticipated.
    B. Floodplain Encroachments
        i. SWFWMD recommends comparing both FEMA and District modeled floodplain information to determine which information is the most current.
        ii. It is anticipated to use FEMA which is what FDOT uses.
            a. SWFWMD may require the use of the watershed studies depending on the most recent information.
                i. WBQ will coordinate with the County floodplain manager to confirm basis of floodplain elevations.
            b. WBQ will coordinate with SWFWMD watershed study point of contact to determine which information is most relevant.
                i. FEMA updated their coastal model recently
                    i. District watershed models are the most recent.
                ii. If FEMA map hasn't been updated with the watershed studies, then may need to use the District's Watershed Study.
            c. The options include cup for cup or a combination of the dynamic storage modeling or cup for cup replacement of historic volume.
        iii. If it is determined that FEMA is not the best study to use, Erin Yao will need to discuss with FTE management as it is FDOT standard to utilize FEMA.
    C. Partnership Opportunities
        i. SWFWMD recommends coordinating with Citrus County as they have projects to try and alleviate residential flooding.
            a. SWFWMD will provide the contacts for Citrus County Staff.

IV. Environmental

    A. Wetlands
        i. Less an 0.25 acre will be impacted.
            a. Proposing to impact but not mitigate due to it being a single isolated system and less than 0.5 acre.
    B. Wildlife/Listed Species
        i. WMD stated that they rely on the USFWS and FWC to identify and address any listed species concerns. Any USFWS/FWC coordination will be provided with the permit application.

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ii. There is not much available habitat within the corridor for protected species.
    a. Design team will coordinate with Florida Fish and Wildlife Conservation Commission (FWC) on application for gopher tortoise's relocation.
    b. Scrub Jay surveys have been completed with negative results. Kestrel surveys are ongoing.
iii. Environmental report will be included with ERP.
    a. SWFWMD would most likely require a site visit once the application is submitted.
        i. Any informal field reviews would have to go through SWFWMD management.

V. Existing Permits

A. Landfill Permit
    i. FTE is the property owner, but it is previously permitted by FDEP.
        a. This permit will be replaced by the SWFWMD permit.
            i. The intent is to submit the ERP permit to identify impacts to the pond under that permit and modify through the ERP.
                i. SWFWMD believes FDEP permit would need to be modified.
                ii. FTE requested confirmation that a SWFWMD would oversee the modification or if a separate permit mod required.
                iii. Design team to coordinate with FDEP to determine if the FDEP ERP should be modified for DRA 1 or if the SWFWMD permit would supersede.
                iv. Design team to determine whether the Solid Waste Long-Term Care Permit requires modification if DRA 1 is modified.
                v. Design team to determine whether potential spreading of metals concentrations exceeding groundwater cleanup target levels (GCTLs) attributed to operation of modified DRA 1 is authorized.

B. Bachschmidt Property Permit
    i. Submitted a permit to become compliant.
        a. Required the development of a stormwater pond.

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ii. FTE wanted to verify the compliance issues would not be tacked onto our project as we take that property and create our pond.
    a. Any issues with the current permit would need to be resolved with ours.
    b. No fines should transfer.
iii. Proposed drainage/site improvements include those permit requirements.
    a. SWFWMD suggests coordinating with compliance department on timing and construction efforts.
    b. SWFWMD will review as well and confirm any specific requirements.

C. Modifications to the ponds in the southern segment (Phase 1) are not anticipated.
    i. A new permit will be required for the current proposed segment of Suncoast 2(Phase 2).

VI. Other Items

A. Any wells impacted by the limits of construction would have to be abandoned appropriately.
    i. Design team will not be impacting the monitoring wells for the landfill.

B. Contamination issues will need to be coordinated with FDEP.
    i. Proposed pond at CR 486 may be within the 1500' buffer of contamination sites noted on the District GIS map.
    ii. The map identified a contamination site near the Duke Energy Right of Way at Maylen Ave.

VII. Action Items

Item No.	Action Item Description	Responsible Party
1	Frank Gargano will provide Citrus County contacts in the notes for this meeting.	**SWFWMD**
2	Confirm basis of floodplain elevations.	**WBQ/FTE**

The preceding is the author's interpretation of the substantive points of the meeting and shall serve as a record of the items discussed. Please send clarifications or revisions to the author's attention within seven (7) days.

DRAFT

Florida Department of Transportation

RON DESANTIS
GOVERNOR

Florida's Turnpike Enterprise
P.O. Box 613069, Ocoee, FL 34761
407-532-3999

KEVIN J. THIBAULT, P.E.
SECRETARY

Suncoast Parkway 2 – From S.R. 44 to C.R. 486 – FPID 442764-1
FDEP Pre- Application Coordination Meeting
Wednesday, July 15, 2020 – 1:00 P.M

Meeting Notes

Francisco Cardona*	FTE	Justin Chamberlin*	FDEP
Erin Yao*	FTE	Tiffany Crosby*	ATKINS
Philip Stein*	FTE	Eric Krebill*	TERRACON
Adriana Kirwan*	FTE	Troy Vargas*	WBQ
Annemarie Hammond*	FTE	Scott Stewart*	WBQ
Carla Burrmann*	FDEP	Haley Thomas*	WBQ
Steve Morgan*	FDEP	David Herman*	WBQ
Sara Perez Lopez*	FDEP		

Annemarie Hammond

** All attendees participated by phone*

I. Introductions

II. Project Overview

A. This project is an extension of the segment of Suncoast 2 which is currently under construction.

B. This project has a proposed four lane typical section, with the drainage designed for an ultimate eight lane typical section.

III. Stormwater Management

A. Citrus Sands Landfill will be impacted due to the realignment of Knoll Road.

B. Existing stormwater pond will require relocation to northwest of Cell #1.
   i. The proposed pond will match the volume and attenuation requirements of the existing DRA 1 Pond.
      a. Proposed location has been reviewed for listed species.

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C. Permit Renewal Plans (2013) show DRA 1 location captures the runoff from the closed landfill cells.
   i. Stormwater runoff from the cells will be routed to the new pond location via ditches or pipes.

D. The Water Management District would like FDEP's approval.
   i. Submit an ERP modification to the existing permit.
   ii. Permit modification is required for the pond relocation only, not the construction of the road.

E. WBQ requested the original stormwater calculations for DRA 1.
   i. FDEP to provide the calculations to WBQ.

IV. Environmental

A. Gopher Tortoise permit likely required.

V. Contamination

A. Anticipate addressing any contamination issues under the WMD permit.

B. District notified design team that groundwater contaminates are present on this site.
   i. FDEP is unclear if it is coming from the landfill.

C. District will look to FDEP to provide guidance on contamination mitigation.
   i. FDEP states this is handled through the Waste Cleanup Section.
   ii. May be handled through the RAI process to complete contamination.

D. Waste Cleanup Section would review the potential impacts to contaminates/ groundwater as part of the ERP modification process.
   i. DRA 1 relocation will need separate contamination analysis included in the permit application.
   ii. Justin Chamberlain from SWFWMD stated that the District is transitioning to rely on the consultant to confirm groundwater contaminates.

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E. FDEP requested type of contaminates that were found.
   i. Monitor Well 3 (MW-S) contains:
      a. Iron
      b. Aluminum
      c. Chromium and Lead
      d. Chromium is an exceedance

F. There are two existing piezometers to monitor groundwater levels near the proposed pond location.
   i. WBQ requested location of monitors to avoid during design.
      a. GPS coordinates were provided.
   ii. Intend to avoid impact to groundwater monitoring sites.

VI. Permitting time Frame/ Permit Fee

A. This will be considered major modification.
   i. FDEP stated that if over 10 AC and under 40 AC, the cost will be $1,400 for a major modification.

VII. Project Schedule

A. Submit FDEP permit application prior to WMD permit submittal.

VIII. Action Items

Item No.	Action Item Description	Responsible Party
1	WBQ requested original stormwater calculations for DRA 1.	FDEP

The preceding is the author's interpretation of the substantive points of the meeting and shall serve as a record of the items discussed. Please send clarifications or revisions to the author's attention within seven (7) days.

DRAFT

Date: September 4, 2020

From: Troy Vargas, P.E., Project Manager

Subject: **Suncoast Parkway 2 – From S.R. 44 to C.R. 486 – FPID 442764-1**
SR 44 Pond Coordination Meeting, August 26th, 2020 – 11:00 A.M.
GoToMeeting Minutes

To Meeting Attendees:

Anthony L. Celani*	FDOT	**Haley Thomas***	WBQ
Derek Burke*	WBQ	**David Herman***	WBQ
Troy Vargas*	WBQ	**Christopher Lancaster***	WBQ
Scott Stewart*	WBQ		

** All Attendees Participated by Phone*

I. Introductions

II. SR 44 Pond

A. Reviewed the proposed SR 44 replacement dry pond with Anthony.
B. WBQ took the calculations provided by D7 and replicated the pond geometry.
    i. Pond bottom and top of bank elevations match original calculations.
    ii. Design team anticipates being able to extend the inflow structure into the new pond location.
C. D7 asked if there are concerns extending the pond North.
    i. Design team stated that there is no real difference in soils in the immediate surrounding area.
    ii. Anticipating that the new pond with the larger volume will suffice.
        a. Design team is currently analyzing the recovery in the existing swales.
        b. Pond doesn't outfall which is consistent with current design.

III. Existing Draining Evaluation

A. Existing Drainage evaluation report was prepared by Horizon in 2011.
    i. Report noted that the pond bottom needed to be further excavated.
        a. Pond bottom was further excavated since original permit.
            i. This matches recent survey performed by the WBQ team.
B. D7 is concerned with recovery and asked how the percolation rates that we have compare to original.
    i. WBQ provided documentation to D7 showing original soil information and recently acquired data from the geotechnical team.

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C. WBQ will continue to provide updates as design progresses.
D. Design Team anticipates a modification of the existing permit since the pond is being replaced in kind.

IV. Action Items

Item No.	Action Item Description	Responsible Party
1	Provide original and more recent soil information.	WBQ
2	Schedule follow up meeting.	WBQ

The preceding is the author's interpretation of the substantive points of the meeting and shall serve as a record of the items discussed. Please send clarifications or revisions to the author's attention within seven (7) days.

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