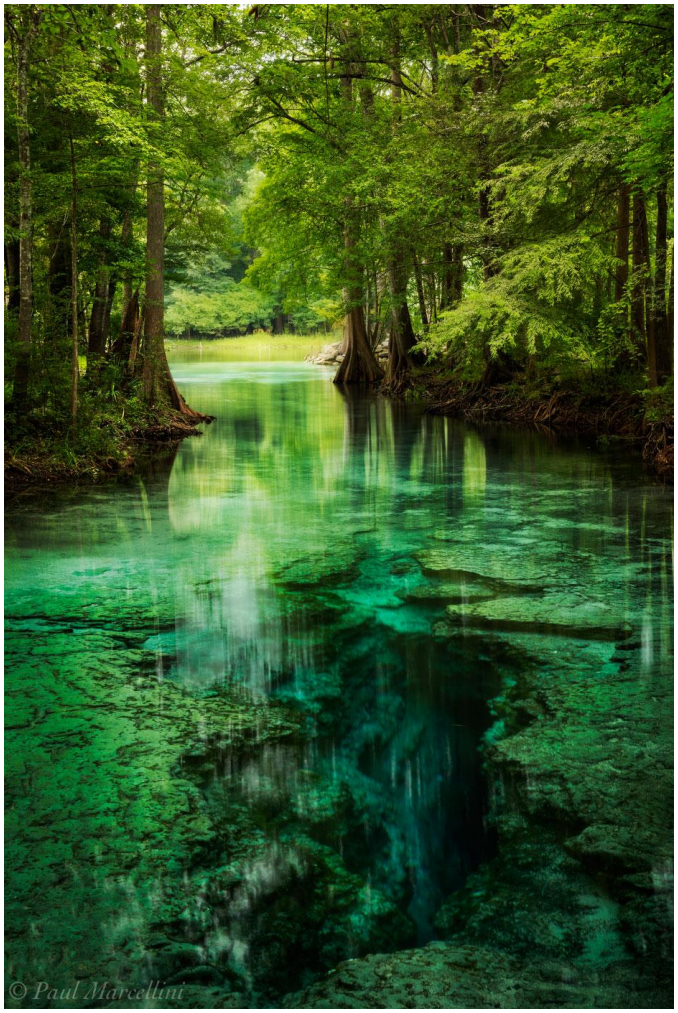
Mill Creek Sink Water Quality Improvement Project

City of Alachua Commission Meeting
10/22/2018

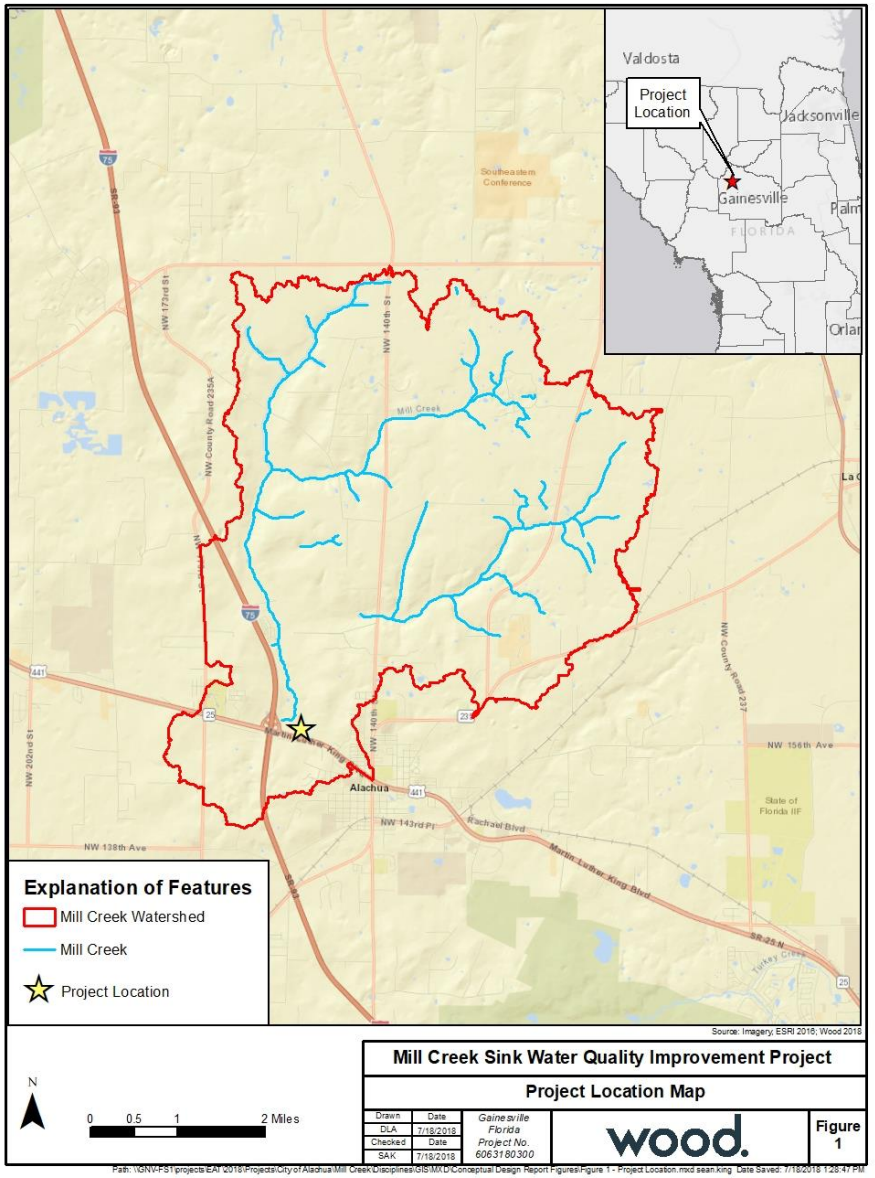
Mill Creek Sink Water Quality Improvement Project

- Purpose
  - Construct a stormwater treatment system primarily to reduce nitrogen loading to the aquifer and springs
- Funding
  - FDEP/SRWMD grant to the City of Alachua
  - $1,400,000 Total
    - $696,665 Land acquisition
    - $703,335 Design/construction



Mill Creek Overview

- Mill Creek Watershed
  - 23 square miles
- Land Use
  - 42% Agricultural
  - 39% Upland Forested
  - 9% Urban
- Impairment (WBID 3644)
  - Dissolved Oxygen
  - Fecal Coliform
  - Nitrate (Santa Fe River)



Source: Imagery ESRI 2017; Alachua County 2014; Wood 2018

Explanation of Features

- Project Site
- Mill Creek
- Mill Creek Swallet
- Mill Creek Sink
- Parcel Boundaries

N

0 125 250 feet

Mill Creek Sink Water Quality Improvement Project

Site Overview

Drawn	Date	Gainesville Florida Project No. 60631800	wood.	Figure 2
DLA	10/10/2018			
Checked	Date			
SAK	10/10/2018			

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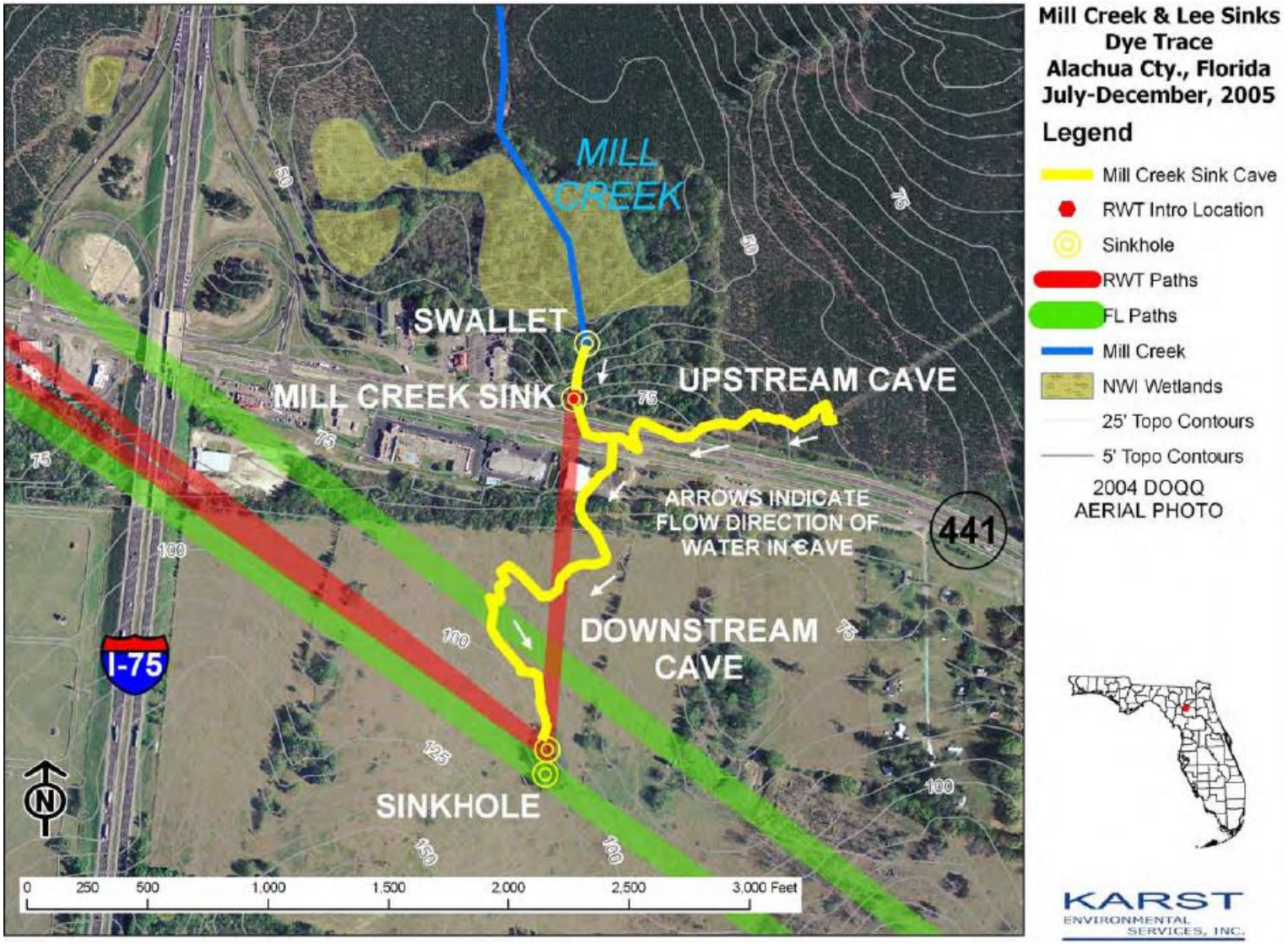
Mill Creek Swallet

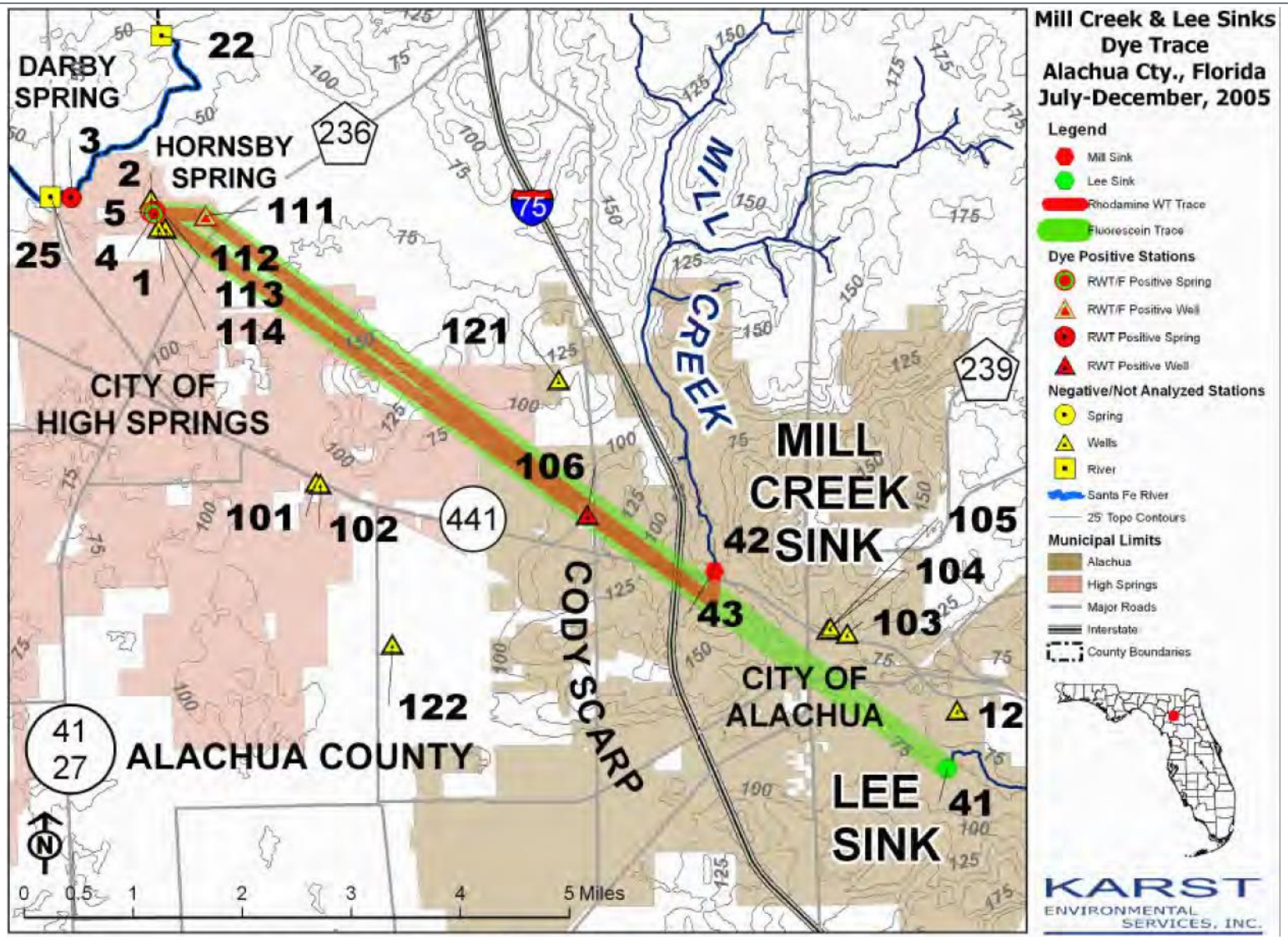
Mill Creek Sink

Mill Creek Sink Dye Trace in 2005

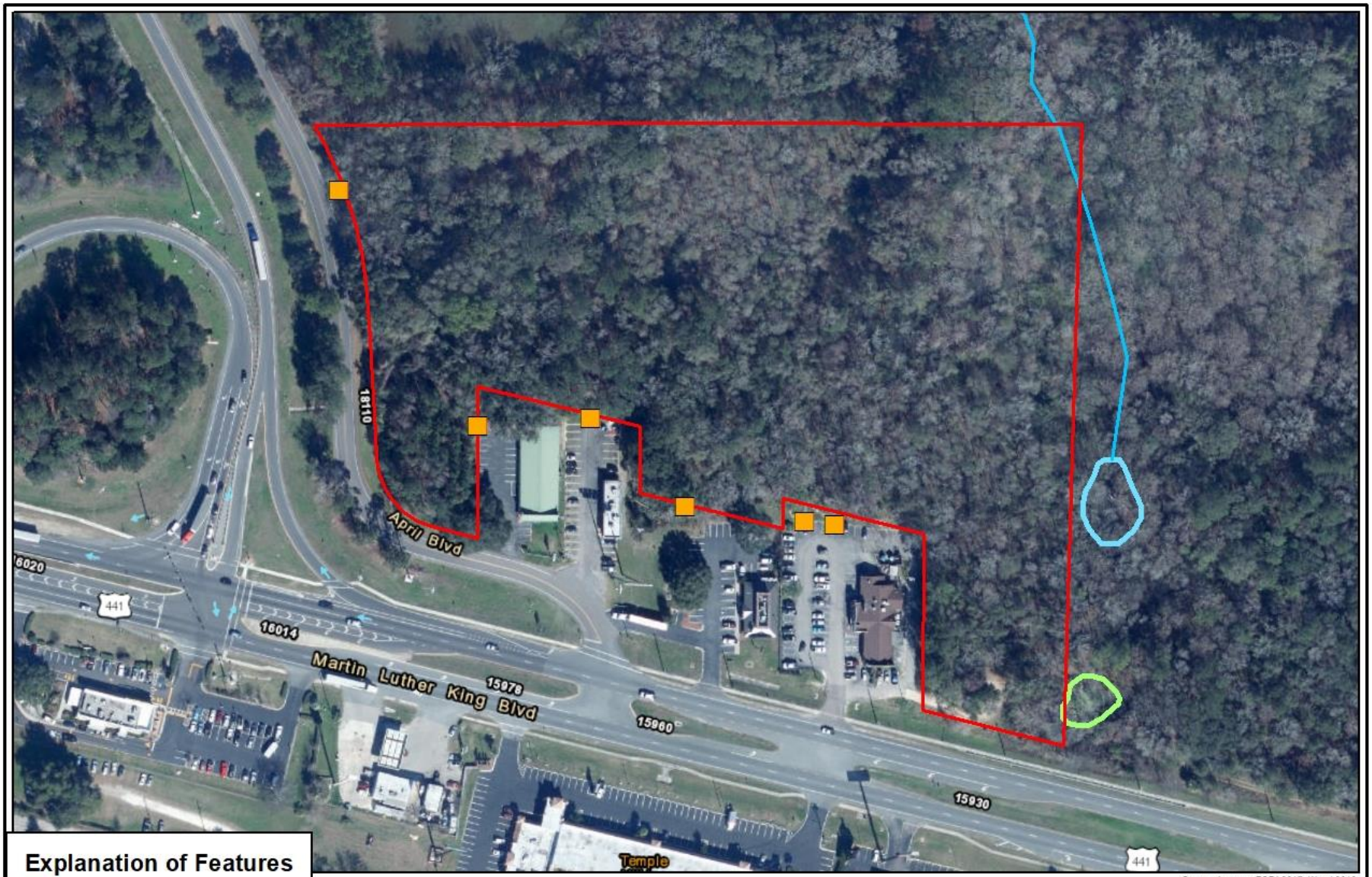


KES 2006

Mill Creek Sink Dye Trace in 2005



KES 2006



Source: Imagery ESRI 2017; Wood 2018

Explanation of Features

- Project Site
- Culverts/Flumes
- Mill Creek
- Mill Creek Swallet
- Mill Creek Sink

N

0 125 250 feet

Mill Creek Sink Water Quality Improvement Project

Site Overview

Drawn	Date	*Gainesville Florida Project No. 60631 80300*	wood.	Figure 2
DLA	10/10/2018			
Checked	Date			
SAK	10/10/2018			

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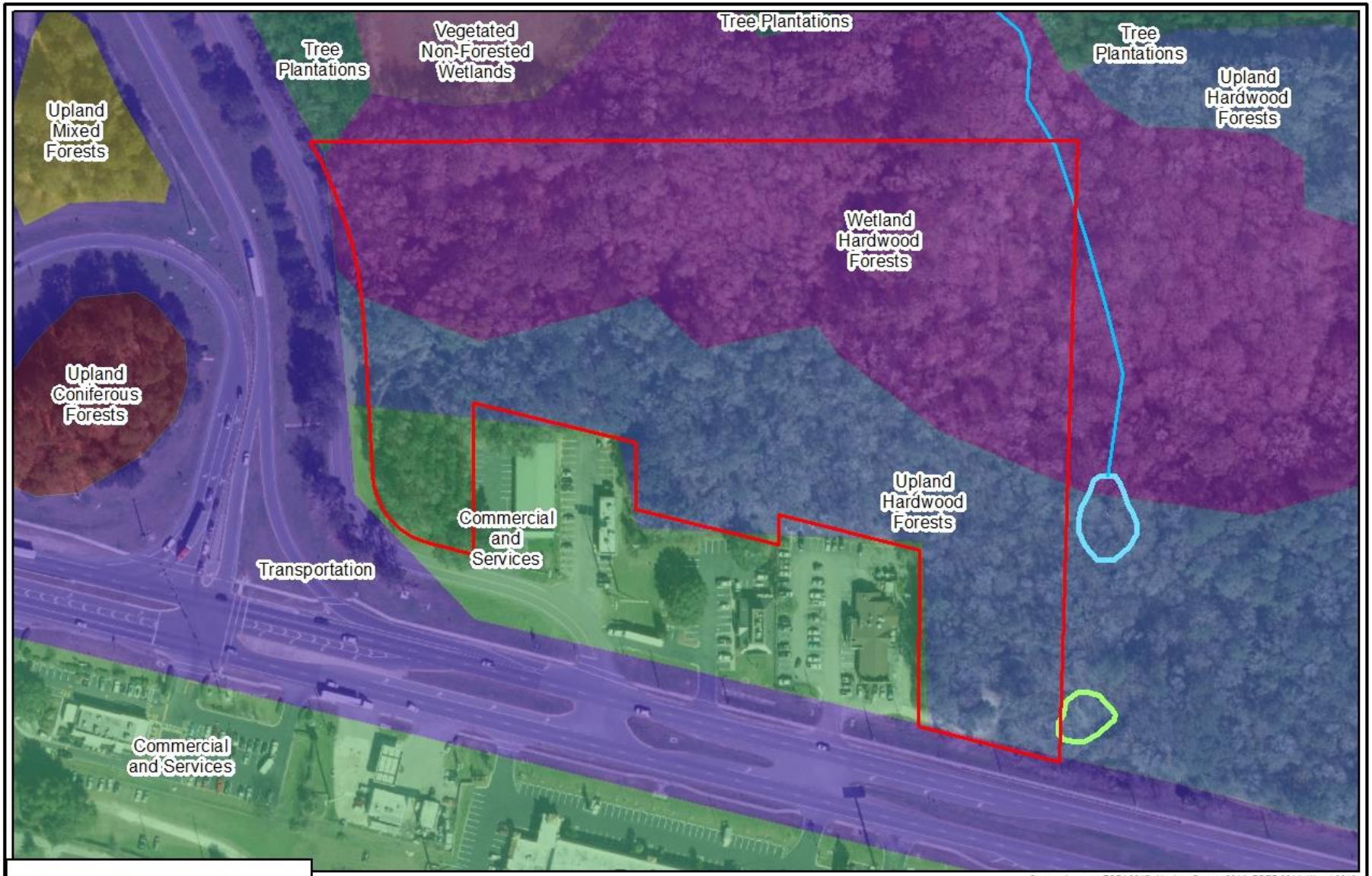
Existing Stormwater Infrastructure

Existing Stormwater Infrastructure

Existing Stormwater Infrastructure



Source: Imagery ESRI 2017; Alachua County 2014; FDEP 2014; Wood 2018

Explanation of Features

- Project Site
- Mill Creek
- Mill Creek Swallet
- Mill Creek Sink

N

0 125 250 feet

Mill Creek Sink Water Quality Improvement Project

Land Use (2013-2014)

Drawn	Date
DLA	10/10/2018
Checked	Date
SAK	10/10/2018

Gainesville Florida
Project No. 60631 80300

wood.

Figure 3

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Mill Creek Sink Water Quality and Quantity Estimates

Table 1. Event Mean Concentrations for Key Pollutants (mg/L)

Land Use Type	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Residential, Low Density	23.0	1.50	0.18
Residential, Medium Density	37.5	1.85	0.31
Residential, High Density	77.8	1.91	0.48
Commercial/Institutional/Recreational	57.5	0.93	0.16
Industrial/Communication/Utilities	60.0	1.14	0.23
Pasture/Golf Courses	94.3	2.48	0.70
Row Crops	19.8	2.47	0.51
Transportation	37.3	1.37	0.17
Undeveloped/Rangeland/Forest/Open Land	8.4	1.15	0.06

Sources: FDEP/WMDs 2010; Harper and Baker 2007

Source: Imagery ESRI 2017; Alachua County 2014; NRCS 2012; Wood 2018

Explanation of Features

- Project Site
- Mill Creek
- Mill Creek Swallet
- Mill Creek Sink

N

0 125 250 feet

Mill Creek Sink Water Quality Improvement Project

Hydrologic Soil Groups

Drawn	Date
DLA	10/10/2018
Checked	Date
SAK	10/10/2018

Gainesville Florida Project No. 60631 80300

wood.

Figure 4

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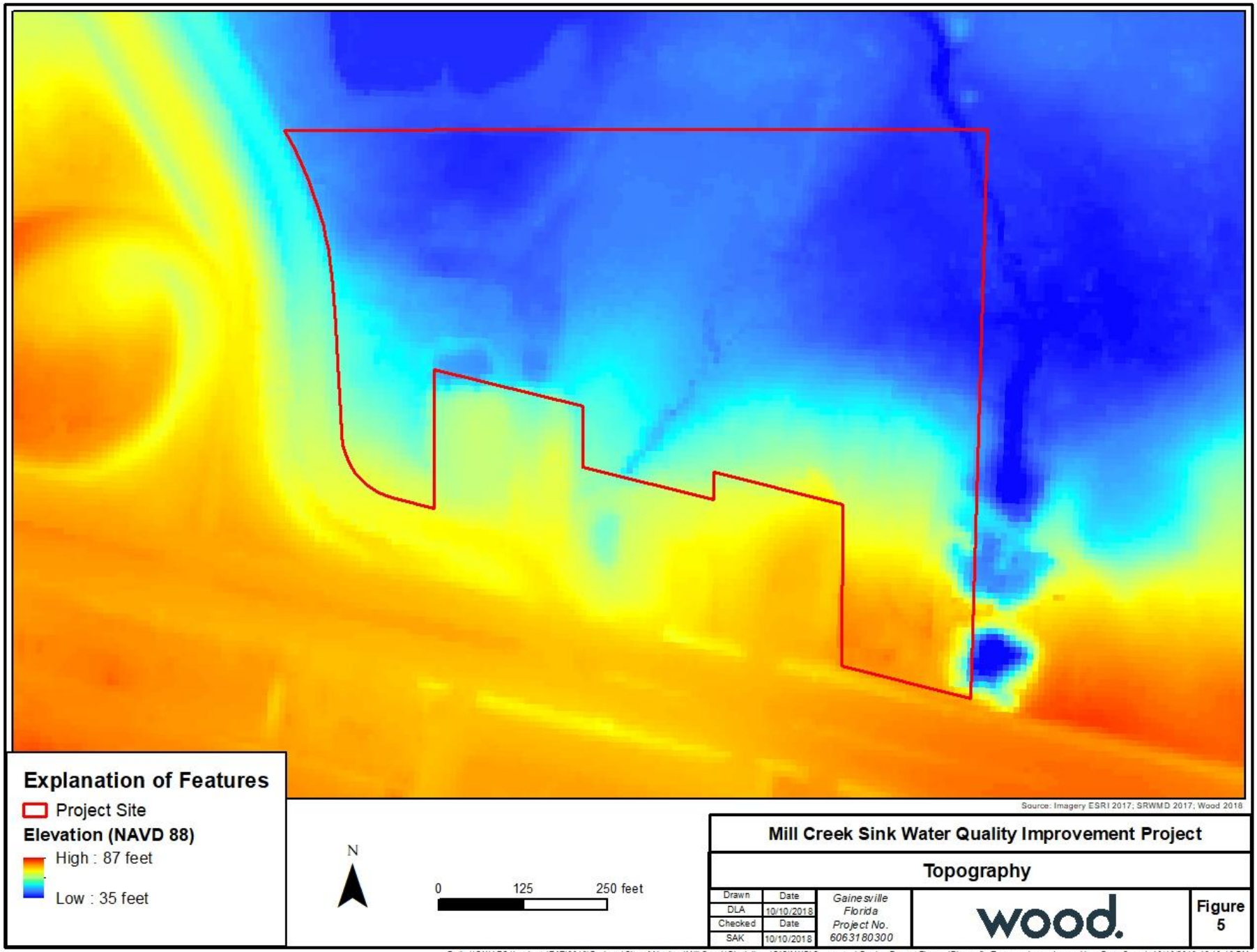

Mill Creek Sink Water Quality Improvement Project

Topography

Drawn	Date	*Gainesville Florida Project No. 6063180300*	wood.	Figure 5
DLA	10/10/2018			
Checked	Date			
SAK	10/10/2018			

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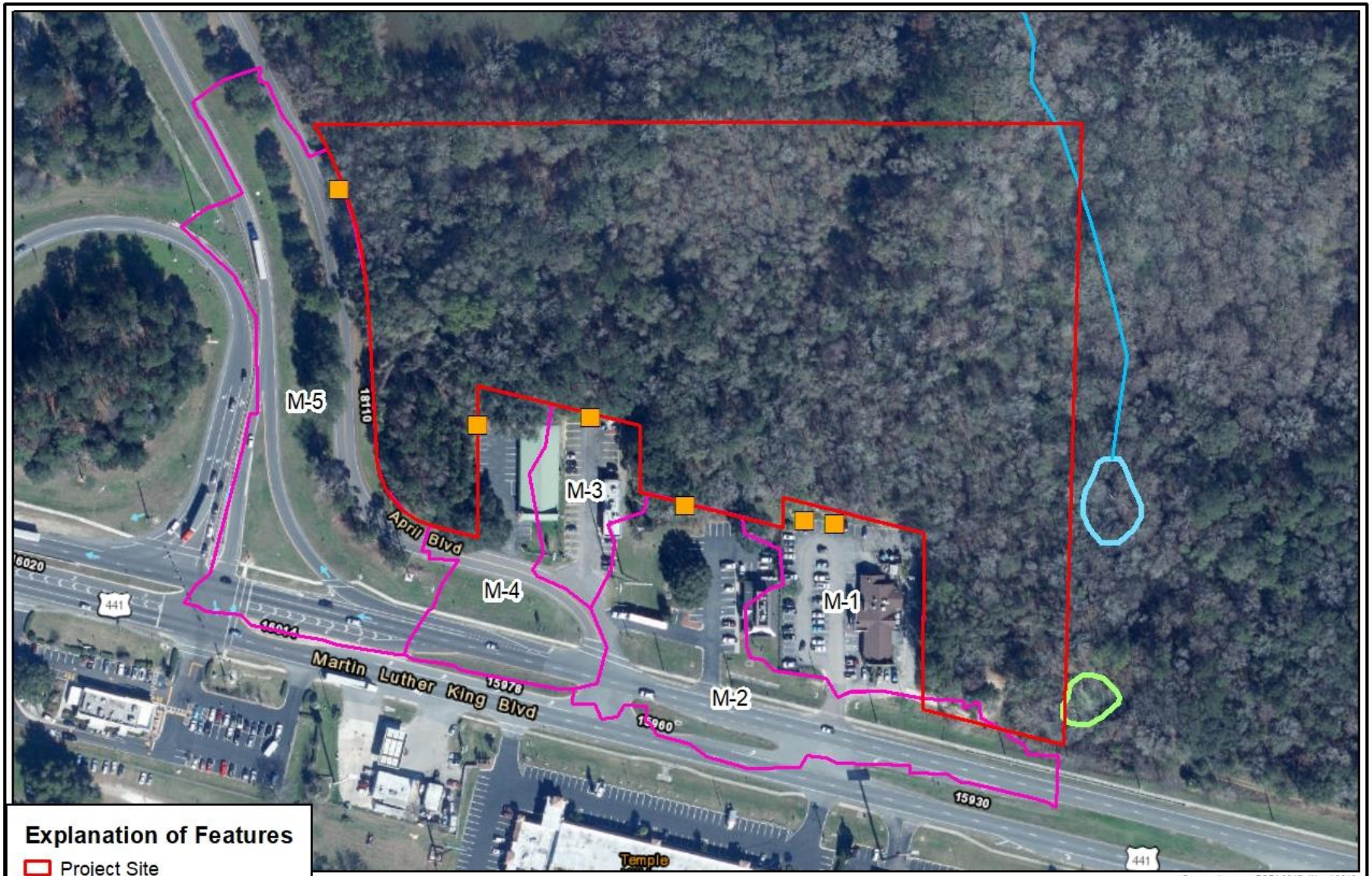

Source: Imagery ESRI 2017; Wood 2018

Explanation of Features

- Project Site
- Sub-basins
- Culverts/Flumes
- Mill Creek
- Mill Creek Swallet
- Mill Creek Sink

N

0 125 250 feet

Mill Creek Sink Water Quality Improvement Project

Primary Contributing Sub-basins

Drawn	Date	Gainesville Florida Project No. 60631803 00	wood.	Figure 6
DLA	10/10/2018			
Checked	Date			
SAK	10/10/2018			

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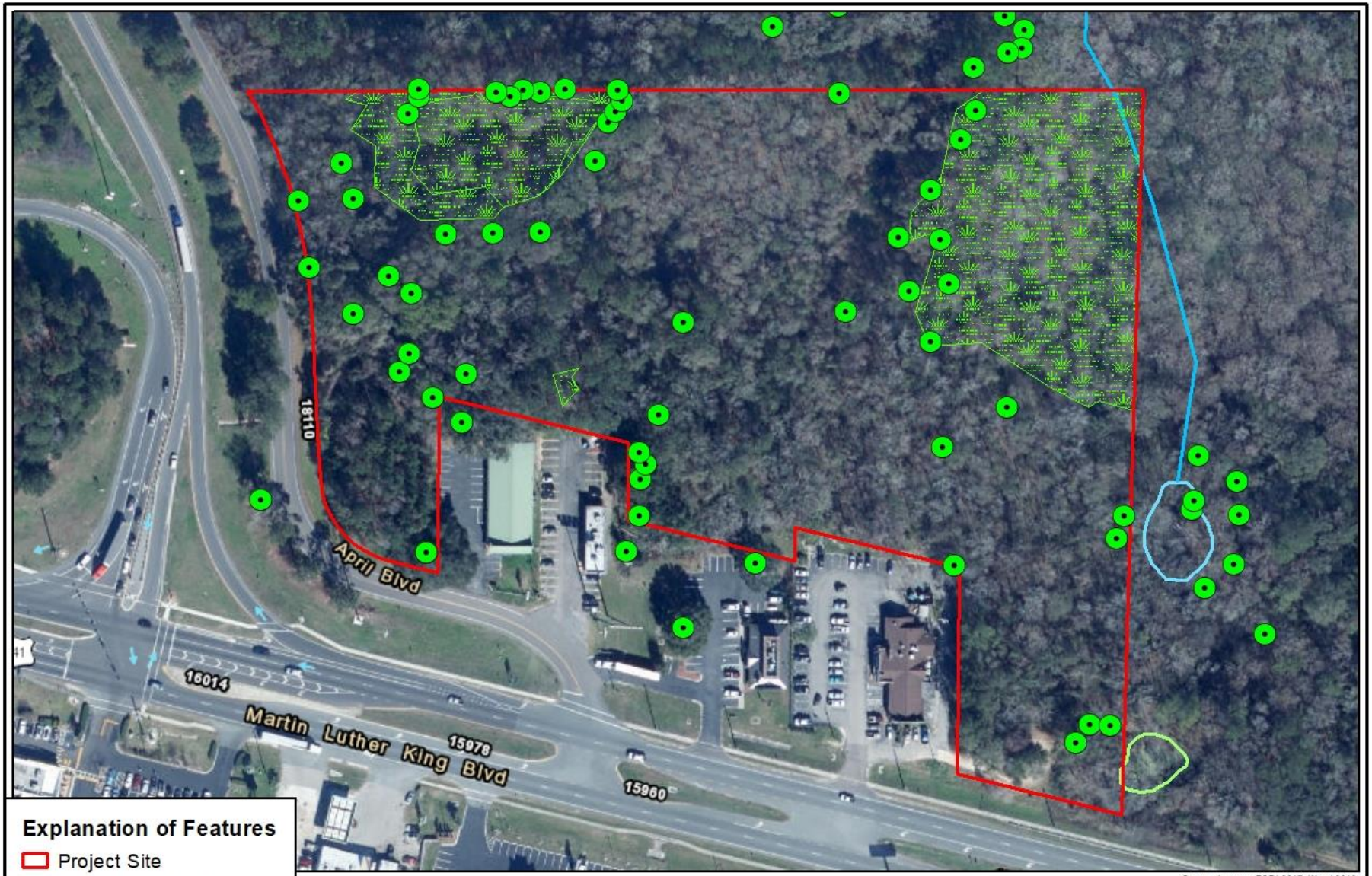
Mill Creek Sink Water Quality and Quantity Estimates

Table 2. Annual Pollutant Loading Estimates for the Primary Contributing Sub-basins (lb/yr)

Sub-basin	Total Suspended Solids	Total Nitrogen	Total Phosphorus
M-1	470	7.9	1.3
M-2	748	19.9	2.7
M-3	287	4.8	0.8
M-4	418	9.7	1.4
M-5	522	18.9	2.3
Total	2,445	61.2	8.6

Table 3. Storm Event Runoff Volumes for the Primary Contributing Sub-basins (acre-feet)

Sub-basin	Mean Annual	25-Year 24-Hour	100-Year 24-Hour
M-1	0.23	0.45	0.61
M-2	0.45	0.90	1.21
M-3	0.14	0.28	0.37
M-4	0.23	0.46	0.62
M-5	0.39	0.76	1.03
Total	1.44	2.85	3.84



Source: Imagery ESRI 2017, Wood 2018

Explanation of Features

- Project Site
- Existing Wetlands
- Heritage Trees
- Mill Creek
- Mill Creek Swallet
- Mill Creek Sink

N

0 125 250 feet

Mill Creek Sink Water Quality Improvement Project

Site Assessment

Drawn	Date
RL	10/11/2018
Checked	Date
SAK	10/11/2018

Gainesville Florida
Project No. 60631800300

wood.

Figure 7

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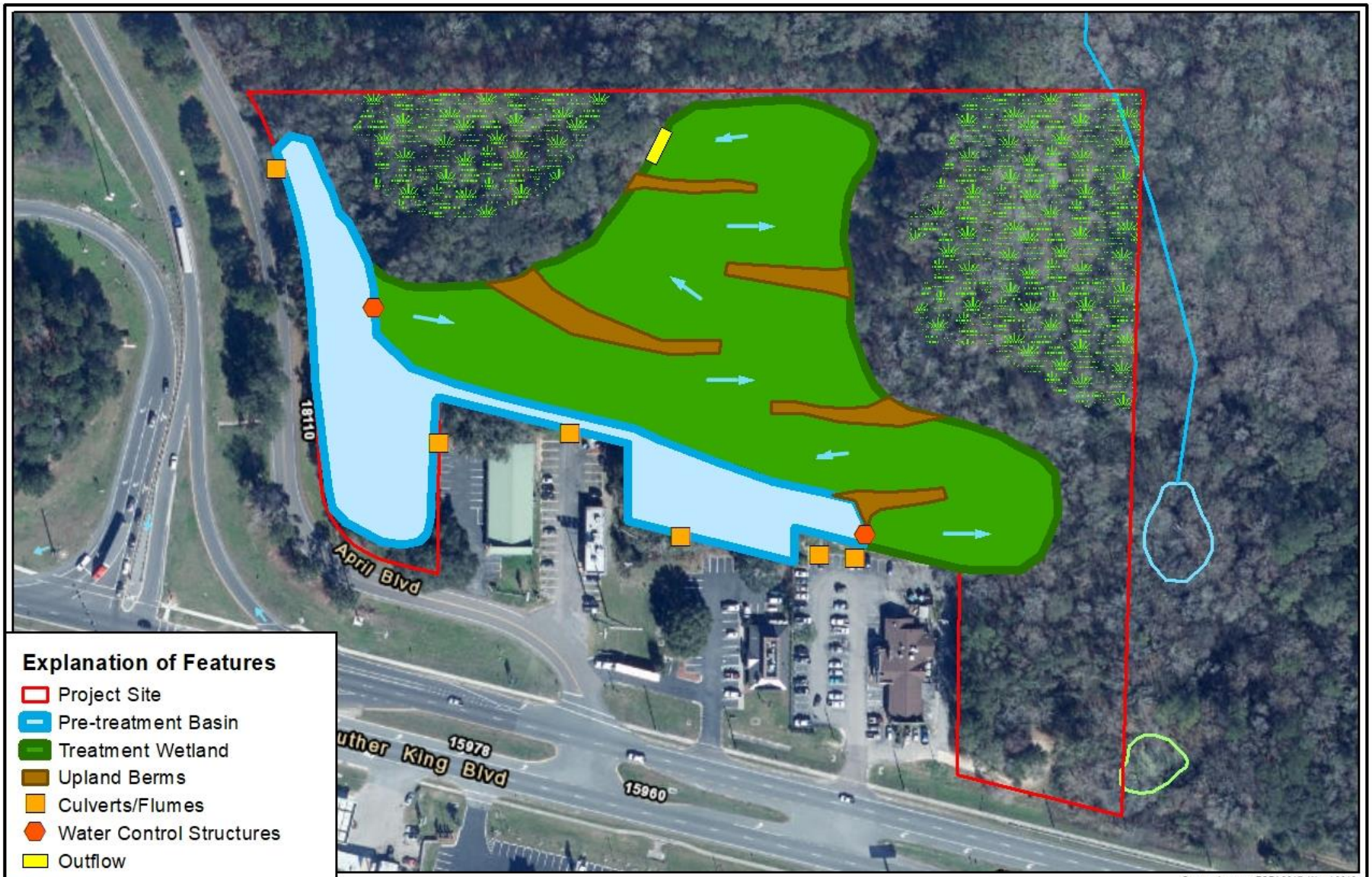

Mill Creek Sink Water Quality Improvement Project

Conceptual Stormwater Treatment System

Drawn	Date
RL	10/12/2018
Checked	Date
SAK	10/12/2018

Gainesville Florida
Project No. 606318 0300

wood.

Figure 8

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Pre-treatment Basin

Treatment Wetland

Mill Creek Sink Water Quality Improvement Project

- Next Steps
  - Geotechnical testing
  - Hydrologic modeling
  - Design plans
  - Permitting
  - Technical specifications / bid documents
  - Construction
    - Anticipated to commence in early 2020

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