

**Tributary DRI**  
(Formerly Known as Three Rivers DRI)  
Nassau County, Florida

**Surface Water Quality Monitoring Plan**

Prepared By



**SES Environmental  
Resource Solutions LLC**

3550 St. Johns Bluff Road South  
Jacksonville, FL 32224

For

Three Rivers Developers, LLC  
c/o Wrathel, Hunt & Associates, LLC  
2300 Glades Road, Suite 410w  
Boca Raton, FL 33431

January 2023

A handwritten signature in blue ink, appearing to read 'Patrick Pierce', is shown above a horizontal line.

**Patrick Pierce**  
**Senior Project Manager**

## 1.0 INTRODUCTION

On behalf of the Developer, Three Rivers Developers, LLC, SES Environmental Resource Solutions LLC (ERS), has developed and intends to implement a Surface Water Quality Monitoring Program (SWQMP) for the Tributary Development of Regional Impact (DRI) upon approval by the Florida Department of Environmental Protection (FDEP). The SWQMP is developed in accordance with the DRI Development Order (DO) Special Condition No. 18 as described in Resolution No. 2021-172 of the Board of County Commissioners of Nassau County, Florida, adopted on 23 August 2021. Pursuant to Special Condition No. 18, ERS will seek approval of the SWQMP from the Northeast District of FDEP.

It should be noted that the current Developer acquired the project and assumed the Developer role in 2019, well after the original DO (Resolution No. 2006-126, 28 August 2006), that included the requirement for a SWQMP, had been issued. Additionally, at the time of acquisition by the current Developer, land clearing and construction activities had commenced in the project area. The original project developer failed to implement a SWQMP. As such, baseline sampling was not completed for the SWQMP and is no longer feasible. As an alternative to the typical method of utilizing baseline sampling data to establish pre-development, target conditions for water quality parameters, ERS is proposing to utilize a method of comparison between proposed stations downstream of existing development areas and a “control” station that is located downstream of undisturbed lands within the project area to establish reasonable standards for parameter analysis (see below for additional detail).

## 2.0 SCOPE

### 2.1 Location of Sampling Stations

The project area generally drains from north to south with C.R. 200 defining the northern boundary of the project's drainage area and Mills Creek and the Nassau River defining the southern boundary (Appendix 1, Exhibits 1 and 2). Sampling stations have been placed on two unnamed tributaries to Mills Creek, itself a tributary of the Nassau River, and one unnamed tributary to the Nassau River. Sampling stations were established with permanent markers in the field on 11 January 2023 and were intentionally selected at locations that appeared to be upstream of tidal influence and estuarine habitats associated with the Nassau River to ensure sampling locations are representative of freshwater flows through the project area and not tidally influenced waters.

**Station TS-1.** This station is located in the northwest section of the project area, west of Police Lodge Road and north of Logan Road. This station is situated on an unnamed tributary to Mills Creek. Because no development has been initiated in the drainage basin upstream of this station, Station TS-1 will initially serve as the control station to establish appropriate pre-development target levels for analyzed water quality parameters at Stations TS-2 and TS-3 because of the previously noted lack of baseline sampling data for the project area.

**Station TS-2.** This station is located centrally along the southern boundary of the project area at a location just north of Police Lodge Road. TS-2 is located on the largest unnamed tributary of Mills Creek that captures drainage from the central area of the project and includes the largest existing construction footprint.

**Station TS-3.** Station TS-3 is located in the southeast section of the project on an unnamed tributary that flows directly to the Nassau River. The Station is located immediately west of an existing recreational park near the southern end of Edwards Road. The drainage basin upstream of this sampling station has been impacted by construction of the recreational park and residential development further to the north.

## **2.2 Baseline Monitoring**

As noted above, because the original developer did not implement the SWQMP prior to initiating construction, typical baseline monitoring is no longer feasible. Because the drainage basin associated with TS-1 has not been impacted by development activities, initial samples from TS-1 will serve as control values for assessment of water quality parameters observed at Stations TS-2 and TS-3. Additionally, parameter trends will be noted at TS-1 as construction progresses into that drainage area.

Because of the lack of baseline data, the initial quarterly samples at TS-1 will be intentionally timed to collect two “wet” and two “dry” sample events. Dry and wet weather sampling criteria will follow the U.S. Environmental Protection Agency’s Environmental Monitoring and Assessment Program (EMAP) protocols. Wet weather samples will be collected within 24 hours after a rain event of greater than 0.1 inches of rainfall but following an interevent period of at least 72 hours (three days of dry weather). Dry weather samples will be taken following at least 7 consecutive days of dry weather.

## **2.3 Construction-Phase Monitoring Program**

ERS will monitor water quality at TS-1, TS-2, and TS-3 throughout development of the Tributary DRI. The construction-phase monitoring program has been designed to identify any impacts, trends, or changes to water quality occurring because of construction activities since the initial implementation of the sampling program. The construction-phase monitoring program will consist of quarterly sampling events for a minimum of two years following the implementation of sampling and will continue through build-out of the project. Parameters to be assessed at each sampling event are identified in Table 1 (attached). If all construction activities have been complete within a sampling station’s basin and no significant impacts to water quality have been identified, ERS may request a reduction in sampling frequency at that station or elimination of that station from the protocol.

ERS will notify FDEP personnel at least 24 hours prior to each planned sampling event, affording FDEP the opportunity to collect split samples or to audit sampling methodologies.

## 3.0 METHODS

### 3.1 Quality Assurance/Quality Control

All field measurement (*in situ* measurements and collection of water samples) will be conducted in accordance with FDEP Standard Operating Procedures (SOPs) 001/01 revision date January 2017 for collection of water quality data and samples. Instrument calibration, replicate sampling, and other specific quality assurance procedures are described in the section.

### 3.2 Surface Water Sampling

**3.2.1 Field Measurements and Observations.** Weather, stream conditions, and field measurements will be recorded at each station using an ERS field data capture sheet (Appendix 2). Weather data will include 24-hour antecedent rainfall based on published data for the Jacksonville International Airport weather station. Stream conditions to be noted will include flow regime, water color, surface clarity, and any nuisance conditions. Field measurements will include total depth, Secchi disk depth, and *in situ* measurements. Water temperature, dissolved oxygen, salinity, pH, and specific conductance will be measured *in situ* using a YSI multi-meter probe or similar instrument. No more than 12 hours before each sampling event, the sampling instrument will be calibrated following the manufacturer's calibration procedure for dissolved oxygen, pH, and conductivity. Following each sampling event, calibration verification checks will be performed to confirm that the measurement error was less than 1.0 percent for all parameters. Values from pre and post calibration will be recorded on the calibration capture sheet for each day of sampling (Appendix 2). Turbidity will be measured in the field using a Hach Model 2100Q nephelometric turbidimeter. The turbidimeter's calibration will be verified in the field using Gelex secondary turbidity standards (0-10 NTU and 0-100 NTU).

**3.2.2 Collection of Water Samples.** Sample collection information, including sampling time, sampling depth, analytical parameters, sample container number, handling procedures, and quality assurance protocol, will be recorded on the ERS field data capture sheet at each station. Pre-cleaned containers with appropriate preservatives added will be provided by the approved, subcontracted laboratory. All sampling containers will be labeled on site with station name, sample identification number, and date and time of collection. Hand-grab water samples for laboratory analyses will be collected subsurface at a depth of the shallower of 0.5 feet or one-half the total depth at each station.

Pursuant to the CompQAP, field duplicate samples will be collected periodically along with the primary samples and will be submitted as blind duplicates to the subcontracted laboratory. Immediately following collection, all samples will be sealed and placed on ice. Chain-of-custody records for the samples will be initiated at the time of collection and kept with the samples at all times in the sealed sample coolers. The samples will be kept in the coolers throughout the process of delivery, and the coolers will be hand-delivered to the subcontract laboratory by ERS personnel.

**3.2.3 Laboratory Analyses.** Water chemistry and bacteriological parameters will be analyzed using U.S. Environmental Protection Agency (EPA) approved methods as identified on Table 1 (attached).

An FDEP-approved environmental water quality laboratory will be subcontracted by ERS to perform all water chemistry and bacteriological testing of the water samples collected at each station. The analytical method detection limit (MDL) for each parameter will be lower than its maximum contaminant level (MCL) based on State of Florida surface water quality criteria as specified in Chapter 62-302.530 of the Florida Administrative Code (FAC). Copies of the laboratory reports will be provided as appendices to the monitoring reports (see Reporting, below).

## **4.0 REPORTING**

### **4.1 Report of Baseline Conditions**

No baseline report will be provided. Project construction was initiated prior to implementation of the SWQMP. Baseline sampling and reporting is no longer feasible.

### **4.2 Quarterly Reports**

Reports of quarterly monitoring events will be submitted to FDEP for review with 30 days of the receipt of laboratory results for each sampling event. Each report will present results for field measurements and laboratory analyses in tabular format with associated water quality criteria. Copies of original laboratory result reports and chain-of-custody forms will be included as report appendices. The report will provide a summary discussion addressing trends in parameter data, observed conditions that may have affected sample measurements or viability, and/or any deviations in scope or methods from those presented in this SWQMP with justification.

## **5.0 REEVALUATION**

After completion of the storm water management system and every five years, unless otherwise agreed upon by FDEP and the Developer, the SWQMP shall be reviewed and evaluated pursuant to Chapter 62-302 FAC. Sampling methods, locations, parameters, and frequency shall be evaluated, and modified if necessary or appropriate. Reevaluation may occur sooner than five years at the request of either the Developer or FDEP with consent of the other party.

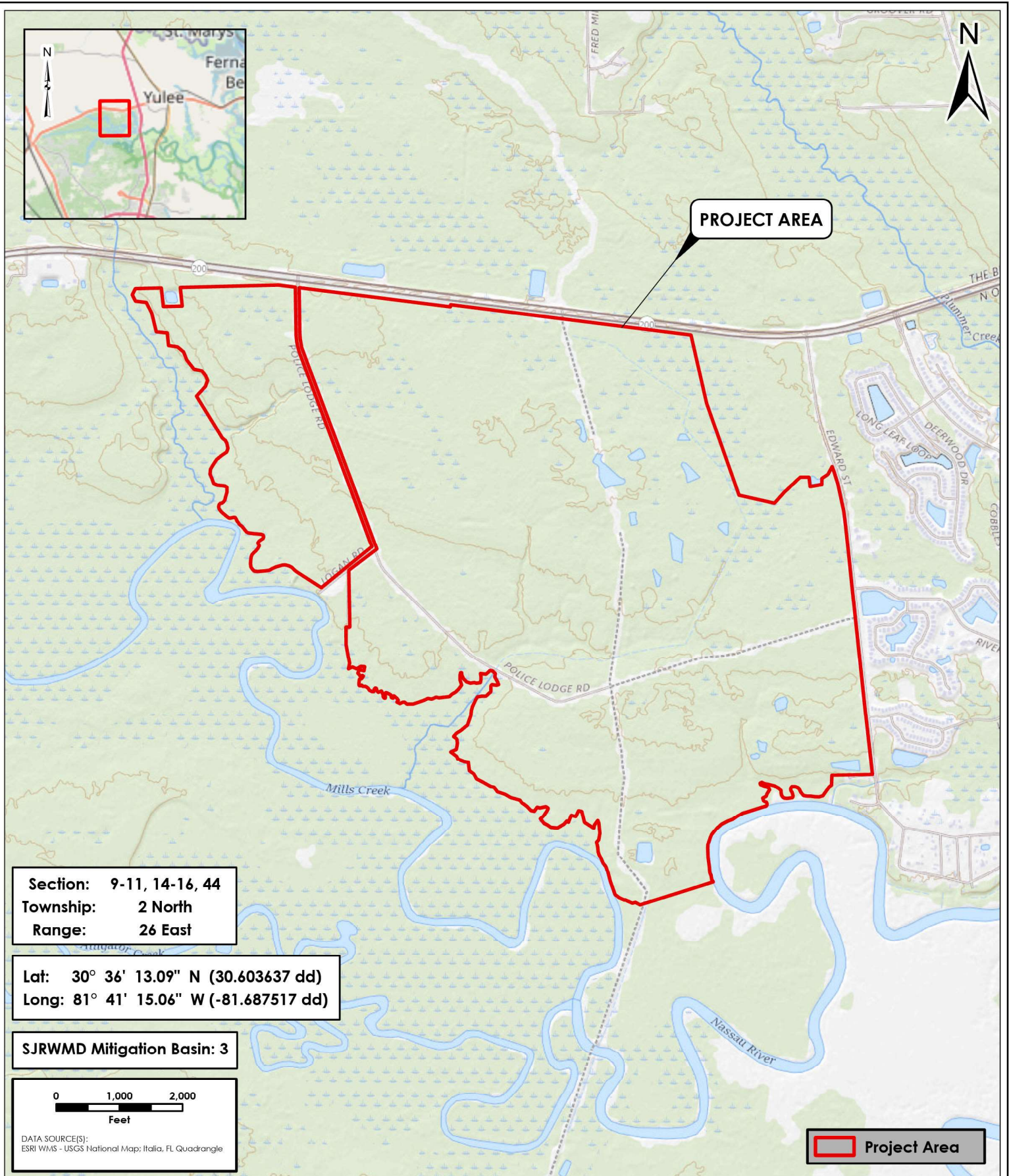
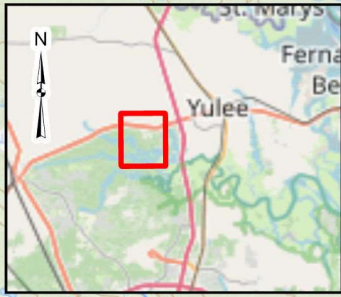
**Table 1. Water quality parameters and analytical methods of construction-phase water quality monitoring at Tributary DRI.**

<b>Parameter</b>	<b>Units</b>	<b>Method</b>
<b>Field (<i>In-Situ</i>) Measurements</b>		
Temperature	°C	EPA 170.0
pH	std. units	EPA 150.1
Dissolved Oxygen (DO)	mg/l	EPA 360.1
Specific Conductance	µmhos/cm	EPA 120.1
Salinity	ppt	EPA 2520-B
Flow	cm/sec	EPA SOP
Secchi Disk Transparency	Feet	EPA SOP
<b>Physical Properties</b>		
Color	CU	SM 2120 B
Total Hardness as CaCO <sub>3</sub>	mg/l	EPA 6010
Total Dissolved Solids (TDS)	mg/l	SM 2540 C
Total Suspended Solids (TSS)	mg/l	SM 2540 D
<b>Inorganic Anions</b>		
Alkalinity	mg/l	SM 2320 B
Total Phosphorus	mg/l	EPA 365.4
Nitrate/Nitrite	mg/l	EPA 300.0
Total Kjeldahl Nitrogen (TKN)	mg/l	EPA 351.2
<b>Organics</b>		
Biochemical Oxygen Demand	mg/l	SM 5210 B
<b>Bacteria</b>		
Fecal Coliform (FC) Bacteria	# /100 ml	Coli-18 QT

## **APPENDIX 1**

Exhibit 1. Location Map  
Exhibit 2. Sampling Station Map





Section: 9-11, 14-16, 44  
Township: 2 North  
Range: 26 East

Lat: 30° 36' 13.09" N (30.603637 dd)  
Long: 81° 41' 15.06" W (-81.687517 dd)

SJRWMD Mitigation Basin: 3

0 1,000 2,000  
Feet

DATA SOURCE(S):  
ESRI WMS - USGS National Map; Italia, FL Quadrangle

 Project Area



**SES Environmental  
Resource Solutions LLC**

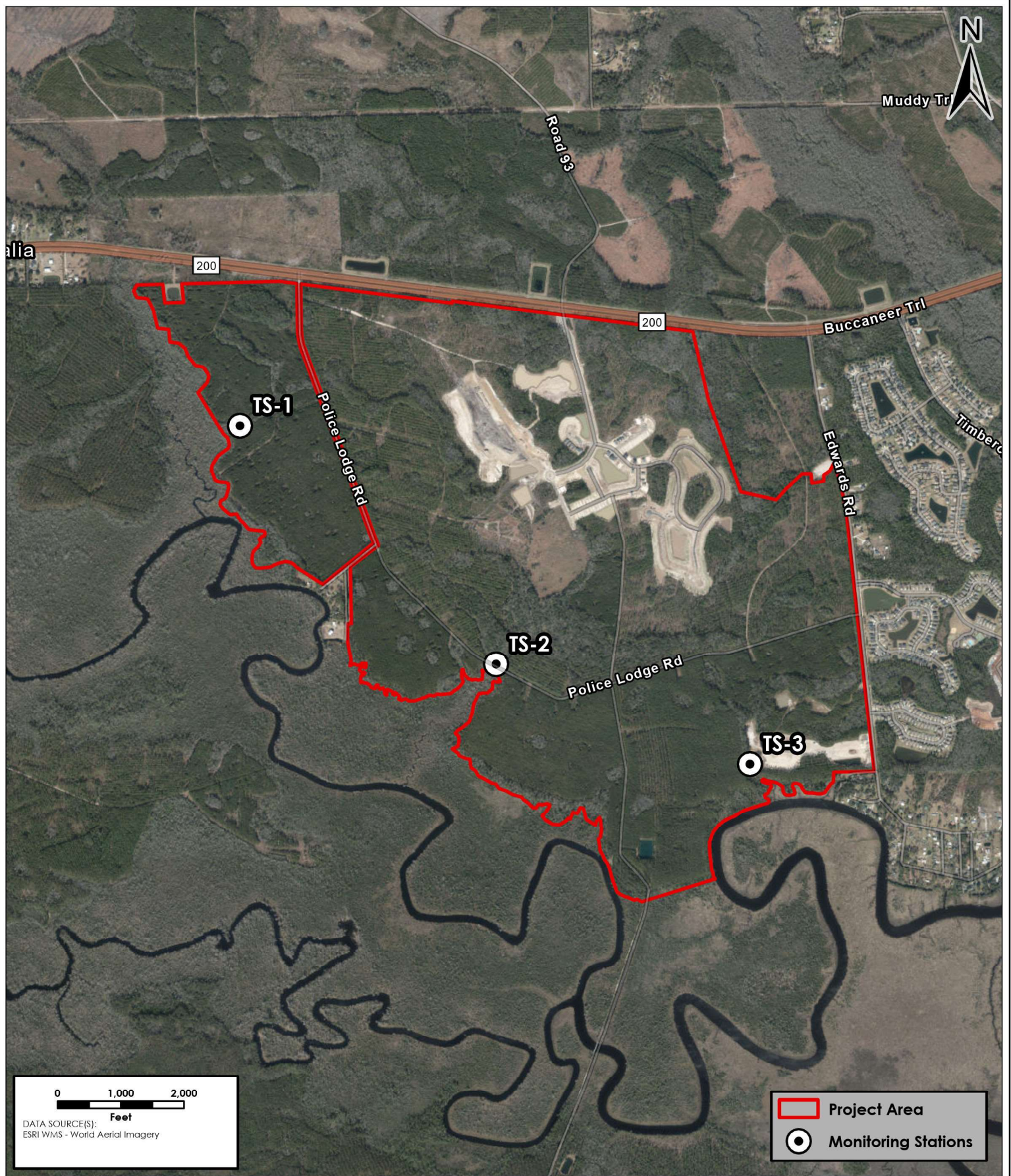
3550 St. Johns Bluff Rd S • Jacksonville, FL 32224  
(904) 565-2820 • [www.ses-grp.com](http://www.ses-grp.com)

## USGS Topographic Map

**Tributary WQ Plan**  
Nassau County, Florida

StS Project No:	2P001.1032.0001.20		
ERS Project No:	23007	Date:	Jan 2023
Drawn By:	DF	EXHIBIT NUMBER <b>1</b>	
Reviewed By:	DL		
Approved By:	PP		





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## Monitoring Stations


**Tributary WQ Plan**  
Nassau County, Florida

SES Project No:	2P001.1032.0001.20	
ERS Project No:	23007	Date: Jan 2023
Drawn By:	DF	EXHIBIT NUMBER <b>2</b>
Reviewed By:	DL	
Approved By:	PP	

## **APPENDIX 2**

**ERS Field Data Capture Sheet  
Calibration Capture Sheet**



<b>Project</b>	WQ Station: _____ Personnel: _____	 <b>SES Environmental Resource Solutions LLC</b>	Date: _____ Time: _____																																											
<b>Field Conditions</b>	Air Temp: _____ °C Cloud Cover: _____ % Windspeed: _____ MPH Wind Direction: _____ Rainfall (past 24 hr): _____ in. Sampling Event: <input type="checkbox"/> "Wet" <input type="checkbox"/> "Dry"	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:25%;"><u>Flow Speed:</u></td><td style="width:25%;"><u>Water Color:</u></td><td style="width:25%;"><u>Water Surface:</u></td><td style="width:25%;"><u>Nuisance</u></td></tr> <tr> <td>Fast</td><td>Clear</td><td>Clear</td><td><u>Conditions:</u></td></tr> <tr> <td>Moderate</td><td>Tannic</td><td>Oily Sheen</td><td></td></tr> <tr> <td>Slow</td><td>Algal</td><td>Slick</td><td></td></tr> <tr> <td>Not Visible</td><td>Other: _____</td><td>Algal Scum</td><td></td></tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:25%;"><u>Water Odors:</u></td><td style="width:25%;"><u>Water Clarity:</u></td><td colspan="2"><u>Hach 2100P Turbidimeter</u></td></tr> <tr> <td>Normal</td><td>Clear</td><td>Calibration</td><td><input type="checkbox"/> 0-10 NTU</td></tr> <tr> <td>Sewage</td><td>Slightly Turbid</td><td>Verification:</td><td><input type="checkbox"/> 0-100 NTU</td></tr> <tr> <td>Petroleum</td><td>Turbid</td><td></td><td></td></tr> <tr> <td>Chemical</td><td>Opaque</td><td></td><td></td></tr> <tr> <td colspan="2"></td><td colspan="2">Turbidity: _____ NTU</td></tr> </table>	<u>Flow Speed:</u>	<u>Water Color:</u>	<u>Water Surface:</u>	<u>Nuisance</u>	Fast	Clear	Clear	<u>Conditions:</u>	Moderate	Tannic	Oily Sheen		Slow	Algal	Slick		Not Visible	Other: _____	Algal Scum		<u>Water Odors:</u>	<u>Water Clarity:</u>	<u>Hach 2100P Turbidimeter</u>		Normal	Clear	Calibration	<input type="checkbox"/> 0-10 NTU	Sewage	Slightly Turbid	Verification:	<input type="checkbox"/> 0-100 NTU	Petroleum	Turbid			Chemical	Opaque					Turbidity: _____ NTU	
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<b>Field Measurements</b>	Measurement Time: _____ Total Depth: _____ ft Secchi Depth: _____ ft In situ Depth: _____ ft Flow: _____ cm/sec	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;"><b>HydroLab Quanta-G</b></td></tr> <tr> <td>Water Temp: _____ °C</td><td>Calibrated meter @ _____</td></tr> <tr> <td>pH: _____ std. Units</td><td><u>pH calibration:</u></td></tr> <tr> <td></td><td><input type="checkbox"/> 7.00 &amp; 4.00 Standards</td></tr> <tr> <td>Cond: _____ µmhos/cm</td><td><input type="checkbox"/> 7.00 &amp; 10.0 Standards</td></tr> <tr> <td>Salinity: _____ ppt</td><td><u>Cond calibration:</u></td></tr> <tr> <td>DO: _____ mg/L</td><td><input type="checkbox"/> 0.005 M KCl (718 µmhos/cm)</td></tr> <tr> <td></td><td><input type="checkbox"/> 0.01 M KCl (1,413 µmhos/cm)</td></tr> <tr> <td>DO: _____ % Sat'n</td><td><input type="checkbox"/> DO calibrated in Air (100% sat'n)</td></tr> </table>	<b>HydroLab Quanta-G</b>		Water Temp: _____ °C	Calibrated meter @ _____	pH: _____ std. Units	<u>pH calibration:</u>		<input type="checkbox"/> 7.00 & 4.00 Standards	Cond: _____ µmhos/cm	<input type="checkbox"/> 7.00 & 10.0 Standards	Salinity: _____ ppt	<u>Cond calibration:</u>	DO: _____ mg/L	<input type="checkbox"/> 0.005 M KCl (718 µmhos/cm)		<input type="checkbox"/> 0.01 M KCl (1,413 µmhos/cm)	DO: _____ % Sat'n	<input type="checkbox"/> DO calibrated in Air (100% sat'n)																										
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<b>Water Sampling</b>	Sampling Time: _____ Sampling Depth: _____ ft <u>Sampling Equipment:</u> <input type="checkbox"/> Hand Grab <input type="checkbox"/> Kemmerer Sampler <input type="checkbox"/> Other: _____ Composite Sample? _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"><u>Sample Parameters:</u></td><td style="width:50%;"><u>Containers:</u></td></tr> <tr> <td>BOD.....</td><td>1,000 ml HDPE (unpreserved)</td></tr> <tr> <td>Color, Alkalinity, TDS, TSS.....</td><td>500 ml HDPE (unpreserved)</td></tr> <tr> <td>TKN, NO<sub>x</sub>, TP.....</td><td>500 ml HDPE (H<sub>2</sub>SO<sub>4</sub>)</td></tr> <tr> <td>Hardness.....</td><td>250 ml HDPE (HNO<sub>3</sub>)</td></tr> <tr> <td>TC, FC (bacteria).....</td><td>Bacterial Vial (Na-thiosulfate)</td></tr> <tr> <td colspan="2">Other: _____</td></tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:60%;"><u>QA/QC Samples:</u></td><td style="width:40%;">Samples on Ice? _____</td></tr> <tr> <td><input type="checkbox"/> Field Duplicate (blind)</td><td></td></tr> <tr> <td><input type="checkbox"/> Equipment Rinse</td><td>Chain-of-Custody _____</td></tr> <tr> <td><input type="checkbox"/> Travel Blank</td><td>Laboratories: _____</td></tr> </table>	<u>Sample Parameters:</u>	<u>Containers:</u>	BOD.....	1,000 ml HDPE (unpreserved)	Color, Alkalinity, TDS, TSS.....	500 ml HDPE (unpreserved)	TKN, NO <sub>x</sub> , TP.....	500 ml HDPE (H <sub>2</sub> SO <sub>4</sub> )	Hardness.....	250 ml HDPE (HNO <sub>3</sub> )	TC, FC (bacteria).....	Bacterial Vial (Na-thiosulfate)	Other: _____		<u>QA/QC Samples:</u>	Samples on Ice? _____	<input type="checkbox"/> Field Duplicate (blind)		<input type="checkbox"/> Equipment Rinse	Chain-of-Custody _____	<input type="checkbox"/> Travel Blank	Laboratories: _____																						
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<u>Additional Notes/Field Observations/Equipment Maintenance:</u>		Signature: _____ Time: _____																																												



# SES Environmental Resource Solutions LLC

Project	Personnel: _____ Location: _____	Date: _____ _____	Start Time: _____ Finish Time: _____
Conductivity	Rinse 3 Times with DI Water _____ Fill with Conductivity Solution Equal to _____ mS/cm Date Received: _____ Lot No: _____ Expiration Date: _____ Reading: _____ mS/cm Adjusted Reading _____ to _____ mS/cm Rinse 3 Times with DI Water _____ Filled with Conductivity Solution Equal to _____ Reading _____		
Dissolved Oxygen %	Rinsed 3 Times with DI Water _____ Filled with DI Water, Water Level Equal to O-ring _____ Blotted Membrane _____ Covered Calibration Cup with Cup Cover _____ Barometric Pressure: _____ mmHg % DO: _____ Sat.		
pH	Rinsed 3 Times with DI Water _____ Filled with pH Solution Equal to <u>7.00</u> Date Received: _____ Lot No: _____ Expiration Date: _____ Reading: _____ Adjusted Reading _____ to pH: _____ Rinsed 3 Times with DI Water _____ Filled with pH Solution Equal to 4.00 (fresh) or 10.00 (marine) Date Received: _____ Lot No: _____ Expiration Date: _____ Reading: _____ Adjusted Reading _____ to pH: _____ Filled with pH Solution Equal to <u>7.00</u> Reading: _____		
Post Sampling Calibration Check Date: _____ Start Time: _____ Finish Time: _____ Filled With Conductivity Solution Equal: _____ mS/cm Reading: _____ mS/cm Filled With pH Solution Equal: _____ Reading: _____ Filled With DI Water: Temperature Reading: _____ C DO Reading: _____ mg/l			