

**From:** Adam R. Hogan <ahogan@alliancece.com>  
**Sent:** Monday, May 9, 2022 4:33 PM  
**To:** Eric Larson <ELarson@EffinghamCounty.org>  
**Cc:** Frank I. Turano <FTurano@alliancece.com>  
**Subject:** EXTERNAL:21162-2051 Ogeechee Run Tide Study - Additional Services

Eric,

We would respectfully request an Additional Fee of \$9,500 for the Salinity Data Collection for the Ogeechee Run Tide Study per Elizabeth Booth's (GA DNR's) request. If this is acceptable, please let us know, and whether this email will suffice or whether we need a formal NTP in place. Once approved, we'll let you know the schedule and we'll let Ms. Booth know that this is proceeding and make another request to do the Modeling in parallel.

Thanks,  
Adam

Adam R. Hogan, PE, LEED Green Associate  
Regional Manager  
Alliance Consulting Engineers, Inc.  
124 Verdae Boulevard, Suite 505  
Greenville, SC 29607-3843  
Tel: (864) 284-1740  
Fax: (864) 284-1741  
Cell: (864) 508-0110  
E-Mail: [ahogan@allianceCE.com](mailto:ahogan@allianceCE.com)  
Web: [www.allianceCE.com](http://www.allianceCE.com)  
Bluffton, SC | Charleston, SC | Charlotte, NC | Columbia, SC | Greenville, SC



2015



2013 2014 2015  
2016 2017 2018

ENRSoutheast



2014 2015 2016  
2017 2018 2019 2020

**From:** Matt Goodrich <mgoodrich@water-ec.com>  
**Sent:** Thursday, April 28, 2022 10:26 AM  
**To:** Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>; Adam R. Hogan <ahogan@alliancece.com>  
**Cc:** Jeff deBessonnet <jdebessonnet@water-ec.com>; John Durkee <jdurkee@water-ec.com>; Eric Larson <ELarson@EffinghamCounty.org>; Causse, Benoit <Benoit.Causse@dnr.ga.gov>; Hayes, Josh <josh.hayes@dnr.ga.gov>; Welte, Josh <Josh.Welte@dnr.ga.gov>; Harlie M. Wdowiak <hwdowiak@alliancece.com>; Frank I. Turano <FTurano@alliancece.com>; Dickson, Audra <Audra.Dickson@dnr.ga.gov>  
**Subject:** EXTERNAL:RE: Effingham County NPDES Permit - Tide Study Plan

Hello Liz:

In the interest of time, can the additional salinity monitoring be done in parallel with moving forward with development of a modeling plan?

Also, salinity, if present, would be highest during dry periods. Would discrete measurements with a hand-held instrument on two different days during relatively dry periods (e.g., no rainfall within the past several days) be sufficient? Or will EPD require deployment of continuous YSI gauges over a specified period (two or four weeks)? Please let me know and we will get the data collected.

Regards,  
Matt

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Matt Goodrich, P.E.  
Principal

**Water Environment Consultants**

P.O. Box 2221  
Mount Pleasant, SC 29465-2221  
Office: 843-375-9022 ext. 2  
Cell: 843-696-0682  
[www.water-ec.com](http://www.water-ec.com)

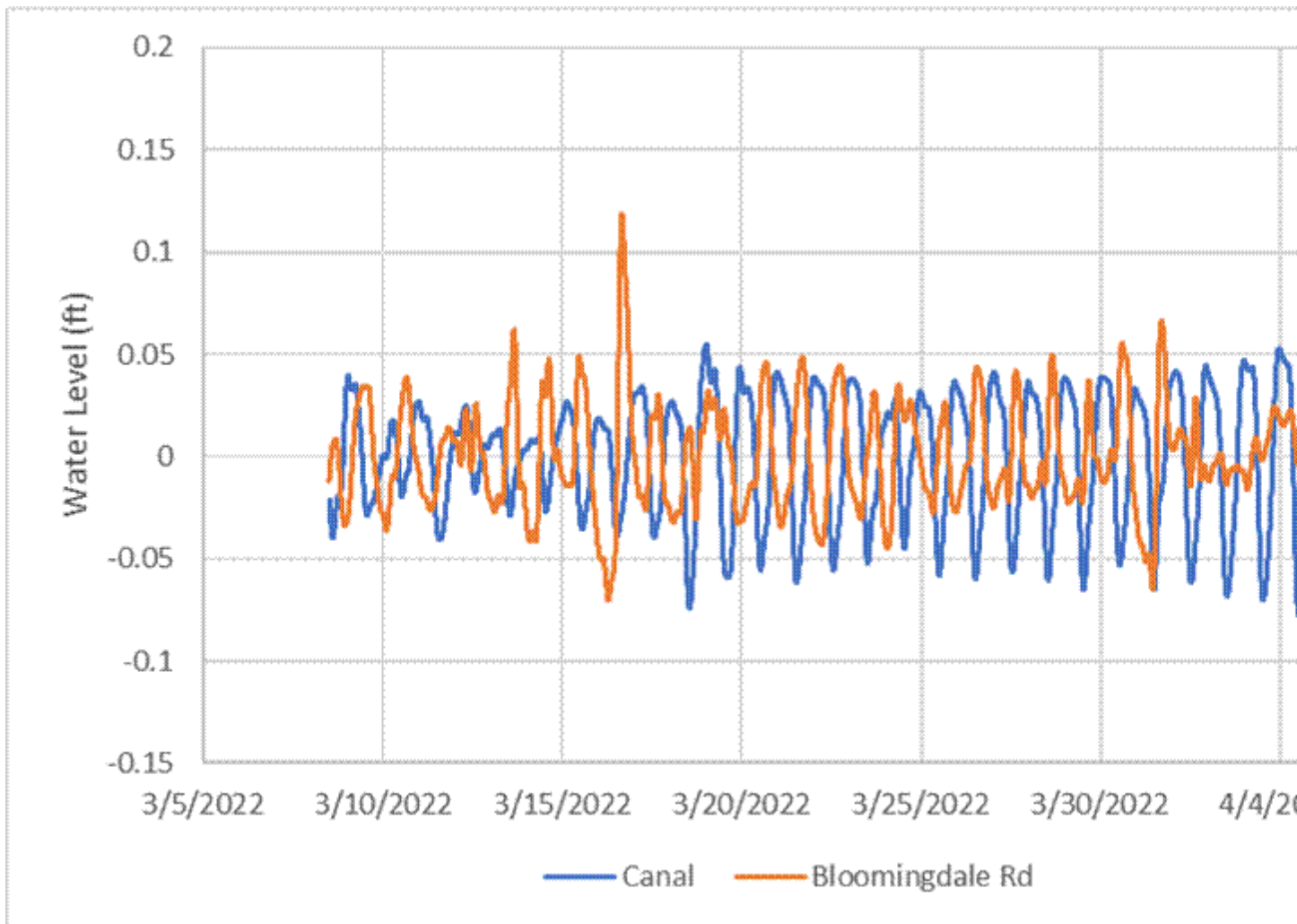
**From:** Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>  
**Sent:** Wednesday, April 27, 2022 9:34 AM  
**To:** Matt Goodrich <mgoodrich@water-ec.com>; Adam R. Hogan <ahogan@alliancece.com>  
**Cc:** Jeff deBessonnet <jdebessonnet@water-ec.com>; John Durkee <jdurkee@water-ec.com>; Eric Larson <ELarson@EffinghamCounty.org>; Causse, Benoit <Benoit.Causse@dnr.ga.gov>; Hayes, Josh <josh.hayes@dnr.ga.gov>; Welte, Josh <Josh.Welte@dnr.ga.gov>; Harlie M. Wdowiak <hwdowiak@alliancece.com>; Frank I. Turano <FTurano@alliancece.com>; Dickson, Audra <Audra.Dickson@dnr.ga.gov>  
**Subject:** EXTERNAL:RE: Effingham County NPDES Permit - Tide Study Plan

To finish this project so it is approvable, you need to collect conductivity/salinity data at both sites. Thanks Liz

**From:** Matt Goodrich <mgoodrich@water-ec.com>  
**Sent:** Wednesday, April 27, 2022 8:35 AM  
**To:** Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>; Adam R. Hogan <ahogan@alliancece.com>  
**Cc:** Jeff deBessonnet <jdebessonnet@water-ec.com>; John Durkee <jdurkee@water-ec.com>; Eric Larson <ELarson@EffinghamCounty.org>; Causse, Benoit <Benoit.Causse@dnr.ga.gov>; Hayes, Josh <josh.hayes@dnr.ga.gov>; Welte, Josh <Josh.Welte@dnr.ga.gov>; Harlie M. Wdowiak <hwdowiak@alliancece.com>; Frank I. Turano <FTurano@alliancece.com>; Dickson, Audra <Audra.Dickson@dnr.ga.gov>  
**Subject:** EXTERNAL:RE: Effingham County NPDES Permit - Tide Study Plan

Hi Liz:

The requested plot is below. The two signals are out of phase with each other, which could be attributed to either travel time or a standing wave phenomenon. We did not collect salinity data.



Regards,  
Matt

-----  
Matt Goodrich, P.E.  
Principal

### Water Environment Consultants

P.O. Box 2221  
Mount Pleasant, SC 29465-2221  
Office: 843-375-9022 ext. 2  
Cell: 843-696-0682  
[www.water-ec.com](http://www.water-ec.com)

### Specialized Engineering and Permitting Support in the Water Environment

**From:** Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>  
**Sent:** Tuesday, April 26, 2022 4:33 PM  
**To:** Adam R. Hogan <ahogan@alliancece.com>  
**Cc:** Matt Goodrich <mgoodrich@water-ec.com>; Jeff deBessonnet <jdebessonnet@water-ec.com>; John Durkee <jdurkee@water-ec.com>; Eric Larson <ELarson@EffinghamCounty.org>; Causse, Benoit <Benoit.Causse@dnr.ga.gov>; Hayes, Josh <josh.hayes@dnr.ga.gov>; Welte, Josh <Josh.Welte@dnr.ga.gov>; Harlie M. Wdowiak <hwdowiak@alliancece.com>; Frank I. Turano <FTurano@alliancece.com>; Dickson, Audra <Audra.Dickson@dnr.ga.gov>  
**Subject:** EXTERNAL:RE: Effingham County NPDES Permit - Tide Study Plan

Thank you for the addition work, the report is much improved.

It is interesting to note the time of travel of the "tidal energy wave." This may explain why the daily diurnal temperature match up at one location and are off at the second. Just for grins and giggles, it may be interesting to see to plot the high frequency graphs on the same plot to see if they are offset by a given time.

Also do you have salinity or conductivity data at the two locations where you recorded stage data?

Thanks Liz

**From:** Adam R. Hogan <[ahogan@alliancece.com](mailto:ahogan@alliancece.com)>  
**Sent:** Tuesday, April 26, 2022 2:23 PM  
**To:** Booth, Elizabeth <[Elizabeth.Booth@dnr.ga.gov](mailto:Elizabeth.Booth@dnr.ga.gov)>  
**Cc:** Matt Goodrich <[mgoodrich@water-ec.com](mailto:mgoodrich@water-ec.com)>; Jeff deBessonnet <[jdebessonnet@water-ec.com](mailto:jdebessonnet@water-ec.com)>; John Durkee <[jdurkee@water-ec.com](mailto:jdurkee@water-ec.com)>; Eric Larson <[ELarson@EffinghamCounty.org](mailto:ELarson@EffinghamCounty.org)>; Causse, Benoit <[Benoit.Causse@dnr.ga.gov](mailto:Benoit.Causse@dnr.ga.gov)>; Adam R. Hogan <[ahogan@alliancece.com](mailto:ahogan@alliancece.com)>; Hayes, Josh <[josh.hayes@dnr.ga.gov](mailto:josh.hayes@dnr.ga.gov)>; Welte, Josh <[Josh.Welte@dnr.ga.gov](mailto:Josh.Welte@dnr.ga.gov)>; Harlie M. Wdowiak <[hwdowiak@alliancece.com](mailto:hwdowiak@alliancece.com)>; Frank I. Turano <[FTurano@alliancece.com](mailto:FTurano@alliancece.com)>; Dickson, Audra <[Audra.Dickson@dnr.ga.gov](mailto:Audra.Dickson@dnr.ga.gov)>  
**Subject:** RE: Effingham County NPDES Permit - Tide Study Plan

Liz/Benoit,

Attached is an updated Tidal Study Report from Alliance and WEC for Effingham County expounding on the potential factors of the diurnal variations in the water level of the Little Ogeechee River. As noted in the report, it appears that Rainfall was the major factor factoring into these variations.

After you've had a chance to review, please let us know if there is a good time to schedule a call to discuss next steps.

Thanks,  
Adam

**From:** Matt Goodrich <mgoodrich@water-ec.com>  
**Sent:** Friday, April 22, 2022 10:15 AM  
**To:** Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>  
**Cc:** Eric Larson <ELarson@EffinghamCounty.org>; John Durkee <jdurkee@water-ec.com>; Jeff deBessonnet <jdebessonnet@water-ec.com>; Causse, Benoit <Benoit.Causse@dnr.ga.gov>; Adam R. Hogan <ahogan@alliancece.com>; Hayes, Josh <josh.hayes@dnr.ga.gov>; Welte, Josh <Josh.Welte@dnr.ga.gov>; Harlie M. Wdowiak <hwdowiak@alliancece.com>; Frank I. Turano <FTurano@alliancece.com>; Dickson, Audra <Audra.Dickson@dnr.ga.gov>  
**Subject:** EXTERNAL:RE: Effingham County NPDES Permit - Tide Study Plan

Hello Liz:

Thank you for the comments. Before we proceed with any additional work, can you please confirm that what we are planning to do will be acceptable?

The very small diurnal variations in the water level (0.1 to 0.15 ft) are unlikely caused by astronomical tidal effects since the tides are dominated by semi-diurnal variations. The gauges also measured temperature, and the water level data appear to be correlated to the diurnal variations in temperature. Also, wind can affect the water level variations.

We are planning on analyzing the relationship between the water levels, temperatures and wind velocities to see if they explain the diurnal variations in the water levels. In addition, we will look at available rainfall data for this period. We do not have any salinity data. Is this approach acceptable?

Thanks,  
Matt

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Matt Goodrich, P.E.  
Principal

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Cell: 843-696-0682  
[www.water-ec.com](http://www.water-ec.com)

### Specialized Engineering and Permitting Support in the Water Environment

**From:** Booth, Elizabeth <[Elizabeth.Booth@dnr.ga.gov](mailto:Elizabeth.Booth@dnr.ga.gov)>  
**Sent:** Friday, April 22, 2022 8:07 AM  
**To:** Adam R. Hogan <[ahogan@alliancece.com](mailto:ahogan@alliancece.com)>; Hayes, Josh <[josh.hayes@dnr.ga.gov](mailto:josh.hayes@dnr.ga.gov)>; Matt Goodrich <[mgoodrich@water-ec.com](mailto:mgoodrich@water-ec.com)>  
**Cc:** Eric Larson <[ELarson@EffinghamCounty.org](mailto:ELarson@EffinghamCounty.org)>; John Durkee <[jdurkee@water-ec.com](mailto:jdurkee@water-ec.com)>; Jeff deBessonnet <[jdebessonnet@water-ec.com](mailto:jdebessonnet@water-ec.com)>; Causse, Benoit <[Benoit.Causse@dnr.ga.gov](mailto:Benoit.Causse@dnr.ga.gov)>; Welte, Josh <[Josh.Welte@dnr.ga.gov](mailto:Josh.Welte@dnr.ga.gov)>; Harlie M. Wdowiak <[hwdowiak@alliancece.com](mailto:hwdowiak@alliancece.com)>; Frank I. Turano <[FTurano@alliancece.com](mailto:FTurano@alliancece.com)>; Dickson, Audra <[Audra.Dickson@dnr.ga.gov](mailto:Audra.Dickson@dnr.ga.gov)>  
**Subject:** RE: Effingham County NPDES Permit - Tide Study Plan

Here are my comments:

The Canal station, which is the blue line in the figure in the Report, is obvious effected by something every day, which is why it goes up and down. We see something similar at the Bloomingdale Road station, the orange line, but to a much smaller extent. I think there is additional information we need before we can make any conclusions. Is the daily rise and fall of the water level due to the energy wave influence of the tides downstream, probably but we don't have the downstream tidal data to correspond it to. At the Canal station, there are also increases of the water levels that occur around the 19<sup>th</sup> and 24<sup>th</sup> probably due to rainfall, but we don't rainfall data to indicate this. We see addition increases in the water level at the Bloomingdale Rd station on the 17<sup>th</sup> and 31<sup>st</sup>. Finally, we need them to include any salinity data that may have been collected that shows that what we see in the figure is not the result of the saltwater tidal wave.

Thanks Liz

**From:** Adam R. Hogan <[ahogan@alliancece.com](mailto:ahogan@alliancece.com)>  
**Sent:** Thursday, April 21, 2022 9:16 PM  
**To:** Hayes, Josh <[josh.hayes@dnr.ga.gov](mailto:josh.hayes@dnr.ga.gov)>; Matt Goodrich <[mgoodrich@water-ec.com](mailto:mgoodrich@water-ec.com)>  
**Cc:** Eric Larson <[ELarson@EffinghamCounty.org](mailto:ELarson@EffinghamCounty.org)>; Booth, Elizabeth <[Elizabeth.Booth@dnr.ga.gov](mailto:Elizabeth.Booth@dnr.ga.gov)>; John Durkee <[jdurkee@water-ec.com](mailto:jdurkee@water-ec.com)>; Jeff deBessonnet <[jdebessonnet@water-ec.com](mailto:jdebessonnet@water-ec.com)>; Causse, Benoit <[Benoit.Causse@dnr.ga.gov](mailto:Benoit.Causse@dnr.ga.gov)>; Welte, Josh <[Josh.Welte@dnr.ga.gov](mailto:Josh.Welte@dnr.ga.gov)>; Harlie M. Wdowiak <[hwdowiak@alliancece.com](mailto:hwdowiak@alliancece.com)>; Frank I. Turano <[FTurano@alliancece.com](mailto:FTurano@alliancece.com)>  
**Subject:** RE: Effingham County NPDES Permit - Tide Study Plan

Benoit,

It's our understanding that you are now the point of contact for this NPDES Permit as Josh Hayes has moved to a new position.

Attached is the Report of the findings of the Tide Study for Effingham County on the Little Ogeechee River. After you've had a chance to review, please let us know if you have any questions.

We'd respectfully like to request a follow-up meeting (virtually) with GA DNR, Effingham County, Alliance and Water Environment Consultants and any other parties necessary to discuss next steps with the NPDES Permitting, which we assume will be some modeling for the proposed discharge. Please let us know if there are any times in the next week that work well for your team.

Thanks,  
Adam

**From:** Adam R. Hogan <ahogan@alliancece.com>  
**Sent:** Wednesday, April 13, 2022 6:55 PM  
**To:** Hayes, Josh <josh.hayes@dnr.ga.gov>; Matt Goodrich <mgoodrich@water-ec.com>  
**Cc:** Eric Larson <ELarson@EffinghamCounty.org>; Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>; John Durkee <jdurkee@water-ec.com>; Jeff deBessonnet <jdebessonnet@water-ec.com>; Causse, Benoit <Benoit.Causse@dnr.ga.gov>; Welte, Josh <Josh.Welte@dnr.ga.gov>; Harlie M. Wdowiak <hwdowiak@alliancece.com>; Frank I. Turano <FTurano@alliancece.com>  
**Subject:** EXTERNAL:RE: Effingham County NPDES Permit - Tide Study Plan

Josh,

Attached is the Report of the findings of the Tide Study for Effingham County on the Little Ogeechee River. After you've had a chance to review, please let us know if you have any questions.

We'd respectfully like to request a follow-up meeting (virtually) with GA DNR, Effingham County, Alliance and Water Environment Consultants and any other parties necessary to discuss next steps with the NPDES Permitting, which we assume will be some modeling for the proposed discharge. Please let us know if there are any times in the next week or two that work well for your team.

Thanks,  
Adam

4/13/22

Adam Hogan, Jeff DeBessonnet, Eric  
Harlie Wdowiak

Get report to EPD. Get next step.  
Offer to model to speed it up.  
They would likely need a work plan.

Next steps would be to do the study, set WLA,

**From:** Adam R. Hogan <ahogan@alliancece.com>  
**Sent:** Saturday, April 9, 2022 10:00 PM  
**To:** Eric Larson <ELarson@EffinghamCounty.org>  
**Cc:** Frank I. Turano <FTurano@alliancece.com>; Harlie M. Wdowiak <hwdowiak@alliancece.com>  
**Subject:** EXTERNAL:21162-2051 Effingham County NPDES Permit - Tide Study

Eric,

The water level gauges for the Tide Study were retrieved this week. Attached is a draft of the Little Ogeechee River Tide Monitoring Report for your review. The results were favorable.

Please let us know if you have any questions or comments, and we can discuss submittal to GA EPD.

Thanks,  
Adam

Adam R. Hogan, PE, LEED Green Associate  
Regional Manager  
Alliance Consulting Engineers, Inc.  
124 Verdae Boulevard, Suite 505  
Greenville, SC 29607-3843  
Tel: (864) 284-1740  
Fax: (864) 284-1741  
Cell: (864) 508-0110  
E-Mail: [ahogan@allianceCE.com](mailto:ahogan@allianceCE.com)  
Web: [www.allianceCE.com](http://www.allianceCE.com)

**From:** Hayes, Josh <josh.hayes@dnr.ga.gov>  
**Sent:** Tuesday, March 1, 2022 3:08 PM  
**To:** Matt Goodrich <mgoodrich@water-ec.com>  
**Cc:** Eric Larson <ELarson@EffinghamCounty.org>; Adam R. Hogan <ahogan@alliancece.com>; Booth, Elizabeth <Elizabeth.Booth@dnr.ga.gov>; Thomas M. Kennedy <TKennedy@alliancece.com>; John Durkee <jdurkee@water-ec.com>; Jeff deBessonnet <jdebessonnet@water-ec.com>; Causse, Benoit <Benoit.Causse@dnr.ga.gov>; Welte, Josh <Josh.Welte@dnr.ga.gov>  
**Subject:** EXTERNAL:RE: Effingham County NPDES Permit - Tide Study Plan

Hello Mr. Goodrich,

We find the sampling locations proposed in the attached document to be acceptable.

Feel free to contact me if you have any questions.

Thanks,

**Josh Hayes**



**Environmental Engineer**  
Municipal Permitting Unit  
Environmental Protection Division  
2 Martin Luther King Jr. Drive  
Suite 1152 – East Tower  
Atlanta, GA 30334  
Phone: (470) 524-0561 **NEW**

**From:** Adam R. Hogan <ahogan@alliancece.com>  
**Sent:** Wednesday, January 26, 2022 9:46 PM  
**To:** josh.hayes@dnr.ga.gov; Elizabeth.Booth@dnr.ga.gov  
**Cc:** Eric Larson <ELarson@EffinghamCounty.org>; Thomas M. Kennedy <TKennedy@alliancece.com>; John Durkee <jdurkee@water-ec.com>; Matt Goodrich <mgoodrich@water-ec.com>; Jeff deBessonnet <jdebessonnet@water-ec.com>  
**Subject:** EXTERNAL:Effingham County NPDES Permit - Tide Study Plan

Josh,

This email is to follow up on the Microsoft Teams Meeting from December 9, 2021.

We are now under contract with Effingham County on a Tide Study related to associated NPDES Permitting for a potential Surface Water Discharge of Treated Wastewater. I've copied Eric Larson with Effingham County along with our other team members on this email.

Attached is a map showing the proposed locations of the tide gauges. We'd like to have your group approve or comment on the locations before we deploy the gauges.

The river is certainly tidal at I-95. We suspect the tidal influence is minimal at the Savannah-Ogeechee canal. We can't pull over to install a gauge at I-16, so the first location for river access to install a gauge above what we expect is the tidally influenced area is at Bloomingdale Road.

If there's any need to have a quick call prior to approving these locations, please let us know.

Thanks,  
Adam