# Williamsburg Treatment Plant

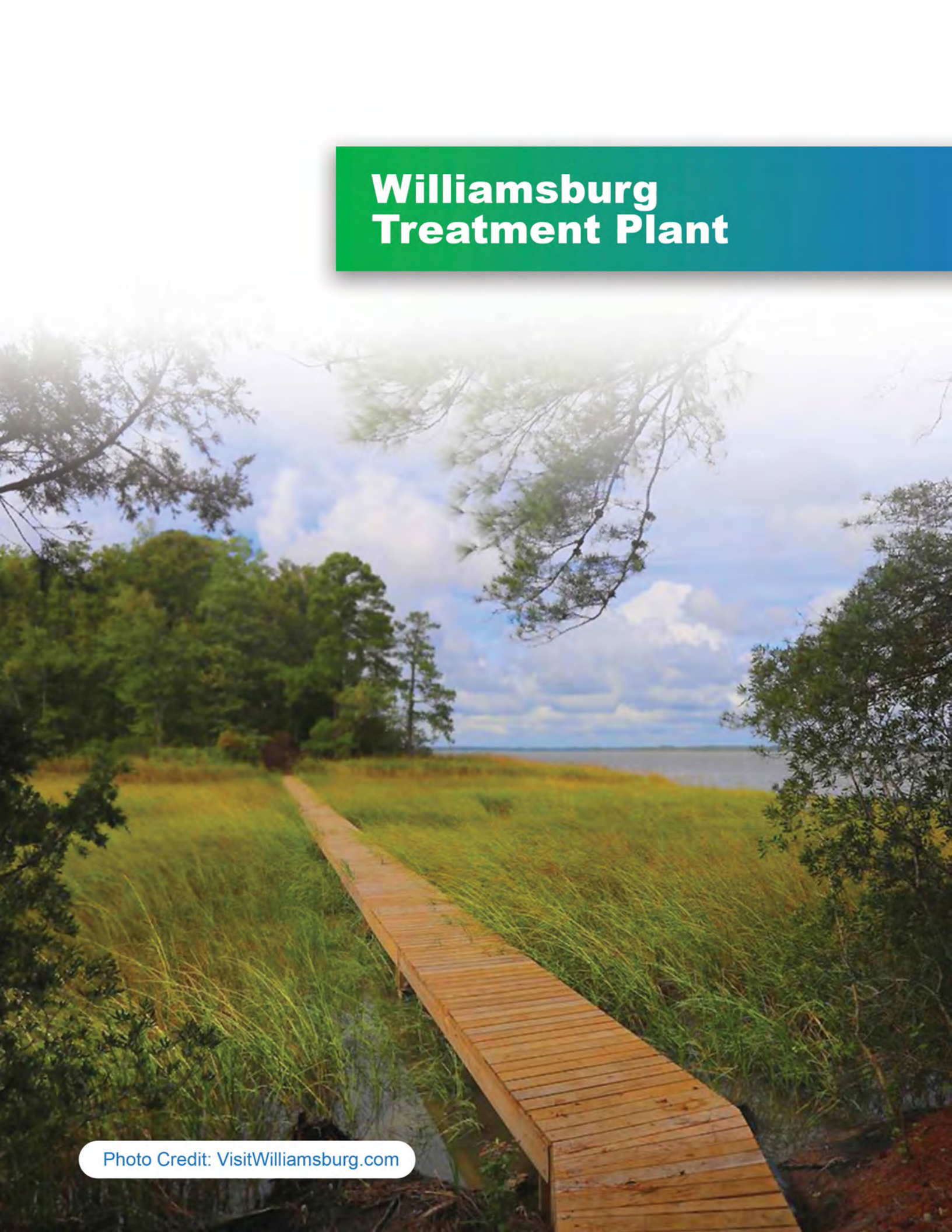
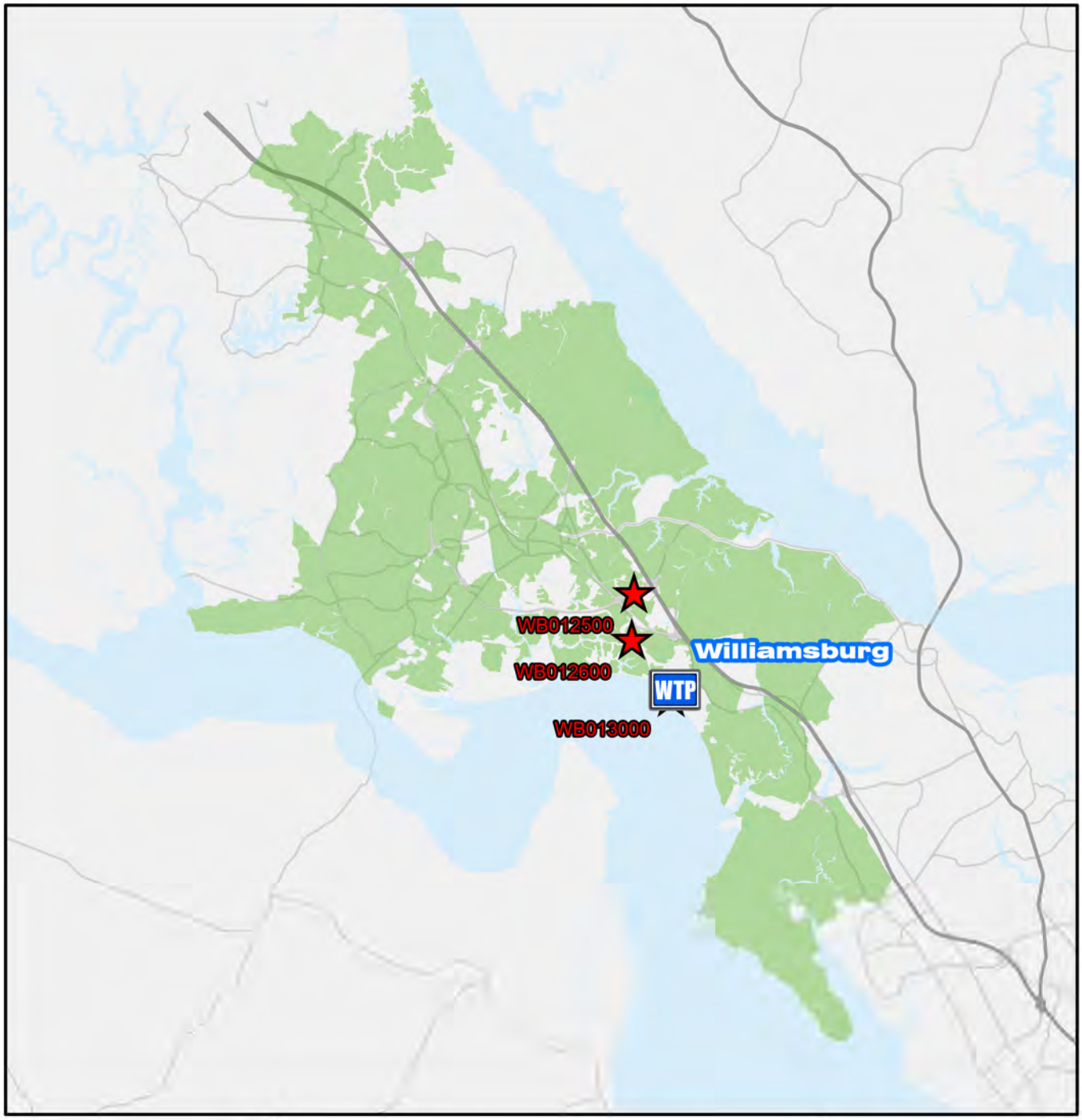


Photo Credit: VisitWilliamsburg.com




**Legend**

- Williamsburg Treatment Plant
- CIP Interceptor Point
- CIP Pump Station Point
- CIP Interceptor Line
- CIP Abandonment
- Treatment Plant Service Area
- HRSD Interceptor Force Main
- HRSD Interceptor Gravity Main
- HRSD Treatment Plant
- HRSD Pressure Reducing Station
- HRSD Pump Station

0 5,000 10,000 20,000 30,000 40,000 Feet

# Williamsburg Treatment Plant Service Area CIP Projects

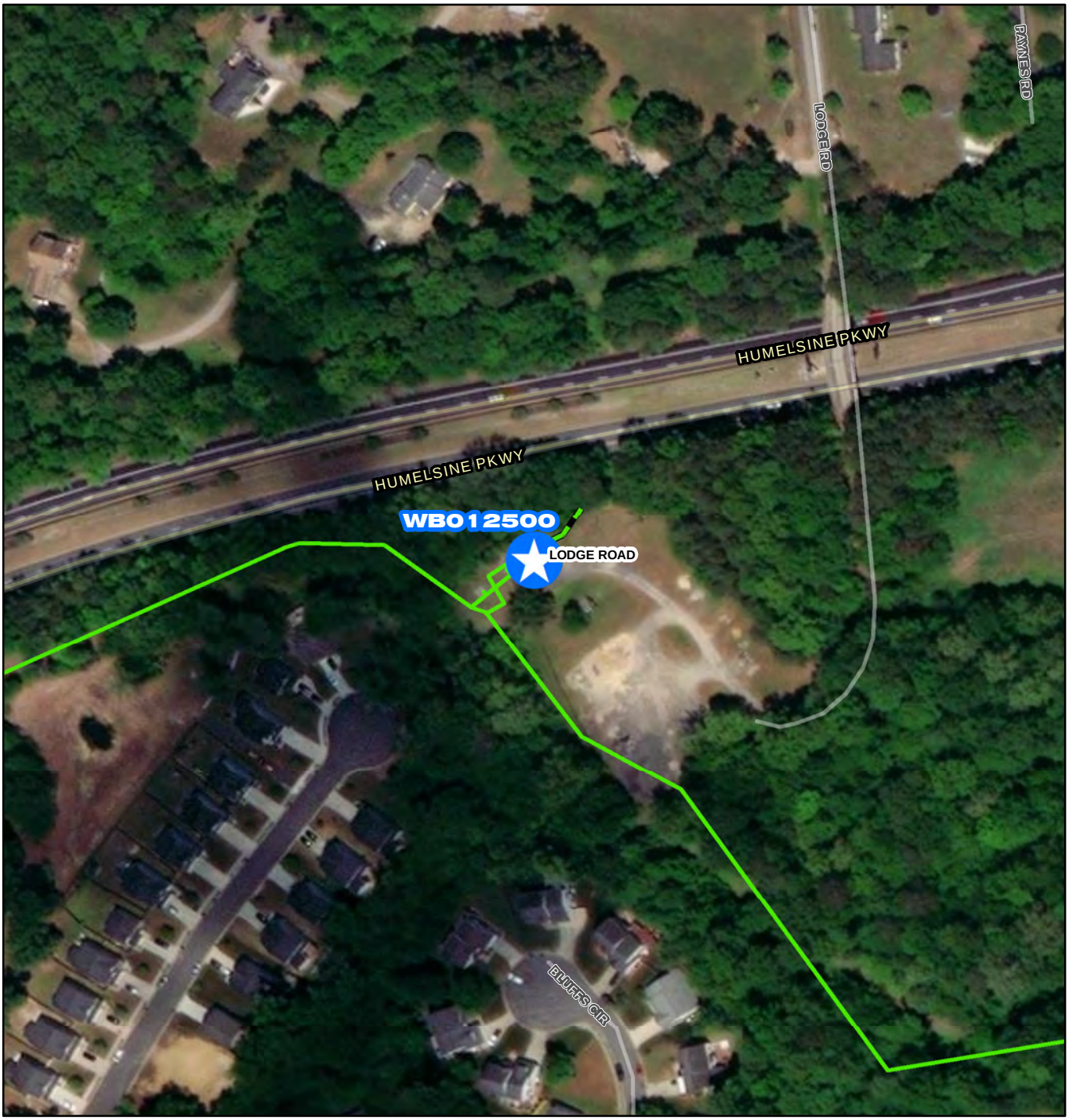
## Treatment Plant Projects

**GN016350**
**GN016351**
**WB012900**
**WB013100**

N

CIP Location

Service Area




**WB012500**

- Project Interceptor Line
- Project Interceptor Point
- Project Pump Station Point
- Project Area

**Legend**

- CIP Interceptor Point
- CIP Pump Station Point
- CIP Interceptor Line
- CIP Abandonment
- CIP Project Area
- HRSD Interceptor Force Main
- HRSD Interceptor Gravity Main
- WTP HRSD Treatment Plant
- PRS HRSD Pressure Reducing Station
- PS HRSD Pump Station

0 55 110 220 330 440 Feet

# WB012500

## Lodge Road Pump Station Upgrades

N
W E
S

**CIP Location**

# Lodge Road Pump Station Upgrades

**PR_WB012500**

System: Williamsburg
Type: Pump Stations

Driver Category: Capacity Improvements
Project Phase: Proposed
Regulatory: None

## PROGRAM CASH FLOW PROJECTION ($,000)

| Prog Cost | Exp to Previous Year | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $1,699 | $0 | $44 | $177 | $921 | $554 | $3 | $0 | $0 | $0 | $0 | $0 |

## PROJECT DESCRIPTION

The project will upgrade the existing Lodge Road Pump Station (PS) including all station pumps, controls, pipe, valves, and electrical infrastructure.

## PROJECT JUSTIFICATION

This project will address needed capacity improvements within York County in an area that has current wet weather capacity challenges and newly proposed additional development flows. Lodge Road PS requires pumping upgrades to provide additional capacity. These improvements will require an electrical service upgrade and will drive replacement of the pumps, electrical equipment, generator, and controls.
Lodge Road PS receives flow from Rolling Hills PS, several York County Pump Stations, and a local collection system. During wet weather periods, the upstream collection system has experienced Sanitary Sewer Overflows (SSOs) related to pumping capacity. An interconnect was installed by North Shore Interceptors to allow Rolling Hills PS to discharge into the Lodge Road PS. The activation of the Route 199 Interim Pressure Reducing Station (PRS) along with the development projections in the service area require capacity enhancement due to increased flow and discharge pressure.

## FUNDING TYPE

Funding Type: Revenue Bond

## CONTACTS

Contacts-Requesting Dept: Operations-Interceptors
Contacts-Dept Contacts: Sam McAdoo
Contacts-Managing Dept: Engineering

## PROPOSED SCHEDULE START DATE

| | |
|---|---|
| PrePlanning | 09/01/2022 |
| PER | 02/01/2023 |
| Design Delay | 07/01/2023 |
| Design | 09/01/2023 |
| Bid Delay | 05/01/2024 |
| PreConstruction | 05/01/2024 |
| Construction | 09/01/2024 |
| Closeout | 01/01/2026 |

## COST ESTIMATE

| **Cost Estimate Class:** | |
|---|---|
| PrePlanning | $0 |
| PER | $44,075 |
| Design | $174,309 |
| PreConstruction | $5,508 |
| Construction | $1,469,175 |
| Closeout | $5,508 |
| **Est. Program Cost** | **$1,698,574** |
| Contingency Budget | $367,294 |
| **Est. Project Costs** | **$2,065,868** |


WB012600

- Project Interceptor Line
- Project Interceptor Point
- Project Pump Station Point
- Project Area

**Legend**

- CIP Interceptor Point
- CIP Pump Station Point
- CIP Interceptor Line
- CIP Abandonment
- CIP Project Area
- HRSD Interceptor Force Main
- HRSD Interceptor Gravity Main
- WTP HRSD Treatment Plant
- PRS HRSD Pressure Reducing Station
- PS HRSD Pump Station

0 55 110 220 330 440 Feet

N W E S

**CIP Location**

# WB012600

## Kingsmill Pump Station Piping Replacement and Wet Well Rehabilitation

HRSD

# Kingsmill PS Piping Replacement and Wet Well Rehabilitation

**PR_WB012600**

System: Williamsburg
Type: Pump Stations

Driver Category: Aging Infrastructure/Rehabilitation
Project Phase: Construction
Regulatory: None

## PROGRAM CASH FLOW PROJECTION ($,000)

| Prog Cost | Exp to Previous Year | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $4,600 | $3,790 | $810 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |

## PROJECT DESCRIPTION

This project involves the rehabilitation of the Kingsmill Pump Station wet well and will require complete bypass of the pump station. Additionally, yard piping, interior and exterior/buried valves, and a portion of the interceptor force main upstream and downstream of the pump station will be replaced as part of this project.

## PROJECT JUSTIFICATION

The existing wet well at the Kingsmill Pump Station is showing signs of significant deterioration, evident by the exposed aggregate documented during wet well inspections. The wet well is also not configured to easily allow for bypass pumping, as there is no slide gate or permanently-mounted suction line currently installed. In the dry well, pump suction valves have been showing signs of significant wear. Recently, one of these valves was replaced because it was determined to be inoperable. Outside the pump station, valves and force main piping need replacement. Three of the eight diversion/isolation valves are inoperable and another three valves are horizontally installed gate valves that have proven to fail prematurely. The reinforced concrete force main in the area where the pump station connects is unnecessarily deep, adding safety risk and potential for delayed repairs in the event of a pipe failure. Since the early 1970's when this pipe was originally installed, 15 to 20 feet of fill has been placed on top of this line, adding a static load onto the pipeline that has already resulted in one failure.

## FUNDING TYPE

Funding Type: Revenue Bond

## CONTACTS

Contacts-Requesting Dept: Operations-Interceptors
Contacts-Dept Contacts: Matt Poe
Contacts-Managing Dept: Engineering

## PROPOSED SCHEDULE START DATE

| | |
|---|---|
| PrePlanning | 07/02/2018 |
| PER | 11/01/2018 |
| Design Delay | 03/01/2019 |
| Design | 03/01/2019 |
| Bid Delay | 03/01/2020 |
| PreConstruction | 03/01/2020 |
| Construction | 06/01/2020 |
| Closeout | 09/01/2022 |

## COST ESTIMATE

| **Cost Estimate Class:** | **Class 1** |
|---|---|
| PrePlanning | $0 |
| PER | $86,572 |
| Design | $199,018 |
| PreConstruction | $12,948 |
| Construction | $4,300,000 |
| Closeout | $1,000 |
| **Est. Program Cost** | **$4,599,538** |
| Contingency Budget | $300,000 |
| **Est. Project Costs** | **$4,899,538** |


WB012900

Project Interceptor Line
Project Interceptor Point
Project Pump Station Point
Project Area

**Legend**

CIP Interceptor Point
CIP Pump Station Point
CIP Interceptor Line
CIP Abandonment
CIP Project Area
HRSD Interceptor Force Main
HRSD Interceptor Gravity Main
WTP HRSD Treatment Plant
PRS HRSD Pressure Reducing Station
PS HRSD Pump Station

0 62.5 125 250 375 500 Feet

# WB012900

## Williamsburg Treatment Plant Administration Building Renovation

HRSD

N
W E
S

**CIP Location**

# Williamsburg Treatment Plant Administration Building Renovation

**PR_WB012900**

System: Williamsburg
Type: Facilities, Buildings and Capital Equipment

Driver Category: Aging Infrastructure/Rehabilitation
Project Phase: Design
Regulatory: None

## PROGRAM CASH FLOW PROJECTION ($,000)

| Prog Cost | Exp to Previous Year | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $3,563 | $1,788 | $1,770 | $5 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |

## PROJECT DESCRIPTION

This project is to renovate the existing 1960s Administration Building at the Williamsburg Treatment Plant.

## PROJECT JUSTIFICATION

This project will replace the 1960s toilets, sinks, showers and lockers and allow for more space in both the men's and women's restrooms; provide much needed office space for plant staff; refurbish the conference room; and create additional work shop space.
This project will also provide for an operations control room in the hurricane category 2 rated administration building. The existing operations control room is in the incinerator building which must be abandoned during tropical storm force winds.

## FUNDING TYPE

Funding Type: Revenue Bond

## CONTACTS

Contacts-Requesting Dept: Operations-Treatment
Contacts-Dept Contacts: Ted Denny
Contacts-Managing Dept: Engineering

## PROPOSED SCHEDULE START DATE

| | |
|---|---|
| PrePlanning | 01/01/2020 |
| PER | 01/01/2020 |
| Design Delay | 07/24/2020 |
| Design | 08/06/2020 |
| Bid Delay | 06/15/2021 |
| PreConstruction | 06/15/2021 |
| Construction | 09/01/2021 |
| Closeout | 02/01/2023 |

## COST ESTIMATE

| **Cost Estimate Class:** | **Class 1** |
|---|---|
| PrePlanning | $0 |
| PER | $27,522 |
| Design | $215,458 |
| PreConstruction | $10,332 |
| Construction | $3,300,000 |
| Closeout | $10,000 |
| **Est. Program Cost** | **$3,563,312** |
| Contingency Budget | $330,000 |
| **Est. Project Costs** | **$3,893,312** |


WB013000

- Project Interceptor Line
- Project Interceptor Point
- Project Pump Station Point
- Project Area

**Legend**

- CIP Interceptor Point
- CIP Pump Station Point
- CIP Interceptor Line
- CIP Abandonment
- CIP Project Area
- HRSD Interceptor Force Main
- HRSD Interceptor Gravity Main
- WTP HRSD Treatment Plant
- PRS HRSD Pressure Reducing Station
- PS HRSD Pump Station

0 55 110 220 330 440 Feet

# WB013000

## Williamsburg Treatment Plant Intermediate Clarifier Wet Weather System

HRSD

N
W E
S

**CIP Location**

# Williamsburg Treatment Plant Intermediate Clarifier Wet Weather System

**PR_WB013000**

System: Williamsburg
Type: Pipelines

Driver Category: Capacity Improvements
Project Phase: Proposed
Regulatory: None

## PROGRAM CASH FLOW PROJECTION ($,000)

| Prog Cost | Exp to Previous Year | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $2,088 | $0 | $139 | $272 | $1,673 | $4 | $0 | $0 | $0 | $0 | $0 | $0 |

## PROJECT DESCRIPTION

This project will provide a pipeline from the intermediate clarifier effluent to the chlorine contact tanks along with automated gates to manage secondary clarifier solids loading during wet weather events.

## PROJECT JUSTIFICATION

Williamsburg Treatment Plant (WBTP) is currently rated at 45 million gallons per day (MGD) peak hydraulic per the original design documents. In 2016, as part of the Regional Wet Weather Management Plan evaluation work, Brown and Caldwell performed hydraulic modeling of WBTP which showed that the plant is capable of handling 55 MGD from a hydraulic standpoint. The problem with the 55 MGD condition is that process modeling demonstrated that an additional secondary clarifier would be needed to avoid significant solids washout during peak flow events. Recent very high peak flow events, which resulted from interceptor system upgrades, have demonstrated that the conclusion of the 2016 evaluation was indeed accurate. This project provided a cost-effective solution for better managing wet weather flows and secondary clarifier solids loading at WBTP and avoids the construction of an additional secondary clarifier or storage tanks in the interceptor system.

## FUNDING TYPE

Funding Type: Revenue Bond

## CONTACTS

Contacts-Requesting Dept: Operations
Contacts-Dept Contacts: Robert Rutherford
Contacts-Managing Dept: Engineering

## PROPOSED SCHEDULE START DATE

| | |
|---|---|
| PrePlanning | 07/01/2022 |
| PER | 08/01/2022 |
| Design Delay | 10/01/2022 |
| Design | 06/01/2023 |
| Bid Delay | 09/01/2023 |
| PreConstruction | 05/01/2024 |
| Construction | 07/01/2024 |
| Closeout | 04/01/2025 |

## COST ESTIMATE

| **Cost Estimate Class:** | |
|---|---|
| PrePlanning | $5,400 |
| PER | $0 |
| Design | $400,271 |
| PreConstruction | $5,400 |
| Construction | $1,671,458 |
| Closeout | $5,400 |
| **Est. Program Cost** | **$2,087,928** |
| Contingency Budget | $334,800 |
| **Est. Project Costs** | **$2,422,728** |


WB013100

- Project Interceptor Line
- Project Interceptor Point
- Project Pump Station Point
- Project Area

**Legend**

- CIP Interceptor Point
- CIP Pump Station Point
- CIP Interceptor Line
- CIP Abandonment
- CIP Project Area
- HRSD Interceptor Force Main
- HRSD Interceptor Gravity Main
- WTP HRSD Treatment Plant
- PRS HRSD Pressure Reducing Station
- PS HRSD Pump Station

0 62.5 125 250 375 500 Feet

# WB013100

## Williamsburg Treatment Plant
## Outfall Flow Control System Repairs

HRSD

N
W E
S

**CIP Location**

# Williamsburg Treatment Plant Outfall Flow Control System Repairs

**PR_WB013100**

System: Williamsburg
Type: Wastewater Treatment

Driver Category: Aging Infrastructure/Rehabilitation
Project Phase: Pre Planning
Regulatory: None

## PROGRAM CASH FLOW PROJECTION ($,000)

| Prog Cost | Exp to Previous Year | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $1,652 | $91 | $201 | $1,355 | $1 | $1 | $1 | $0 | $0 | $0 | $0 | $0 |

## PROJECT DESCRIPTION

This project will replace worn out flow control and isolation valves on the outfall flow control system used to maintain water level in the chlorine contact tanks. To replace valves, the contractor will need to isolate the outfall to prevent river water from entering the flow control vault.

## PROJECT JUSTIFICATION

This project will ensure proper flow control from the chlorine contact tanks to the outfall and maintain the required water level in the chlorine contact tanks by replacing worn out flow control valves. It will also replace leaking isolation valves needed to isolate flow control valves for maintenance and repair.

## FUNDING TYPE

Funding Type: Revenue Bond

## CONTACTS

Contacts-Requesting Dept: Operations
Contacts-Dept Contacts: Ann Copeland
Contacts-Managing Dept: Engineering

## PROPOSED SCHEDULE START DATE

| | |
|---|---|
| PrePlanning | 07/01/2021 |
| PER | 07/29/2021 |
| Design Delay | 09/17/2021 |
| Design | 05/27/2022 |
| Bid Delay | 08/30/2022 |
| PreConstruction | 05/09/2023 |
| Construction | 06/19/2023 |
| Closeout | 04/15/2024 |

## COST ESTIMATE

| **Cost Estimate Class:** | |
|---|---|
| PrePlanning | $0 |
| PER | $0 |
| Design | $136,800 |
| PreConstruction | $5,000 |
| Construction | $1,505,200 |
| Closeout | $5,000 |
| **Est. Program Cost** | **$1,652,000** |
| Contingency Budget | $301,040 |
| **Est. Project Costs** | **$1,953,040** |

# High Priority Projects Round 2 Project 1

**PR_WB013200**

System: Williamsburg
Type: Pipelines

Driver Category: I&I Abatement-IP/RWWMP
Project Phase: Proposed
Regulatory: Integrated Plan-HPP 2

## PROGRAM CASH FLOW PROJECTION ($,000)

| Prog Cost | Exp to Previous Year | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $12,979 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $6,345 | $6,634 |

## PROJECT DESCRIPTION

High Priority Project (HPP) Round 2 Project 1 consists of the following Regional Wet Weather Management Plan (RWWMP) Project ID and general description:
WB-RWWMP-02 Williamsburg Crossing Pressure Reducing Station, Force Main and Storage Tank
WB-RWWMP-07 York County Inflow and Infiltration (I&I) Reduction
WB-RWWMP-14 York County Inflow and Infiltration (I&I) Reduction
WB-RWWMP-19 Lodge Road Pump Station Extended Wet Well
WB-RWWMP-12 York County Inflow and Infiltration (I&I) Reduction

## PROJECT JUSTIFICATION

As part of the RWWMP submitted to the DEQ and EPA, HRSD developed an approach to recognize the highest-priority system improvements with the greatest relative environmental benefit. The result being the identification of High-Priority Projects (HPPs). The initial HPPs (Round 1) were identified in the RWWMP, submitted to EPA in September of 2017, and are scheduled to be constructed between plan approval and 2030. Further review of RWWMP projects was conducted in 2019 to find beneficial solutions to implement as a second set of HPPs (identified as Round 2). A prioritization methodology was used to identify improvements to minimize sanitary sewer overflow (SSO) volume.
Rounds 1 and 2 of High-Priority Projects were scheduled with consecutive 10-year implementation periods starting with Round 1 being completed between plan approval and 2030. Prior to commencement, HRSD will review the Round 2 projects to confirm that they are still expected to meet the desired result and confirm this in a check in with the EPA/DEQ. To modify the list of specific Round 2 HPP projects, HRSD will show that the revised set of projects will attain a minimum of the same percent reduction, or better.

## FUNDING TYPE

Funding Type: Revenue Bond

## CONTACTS

Contacts-Requesting Dept: Engineering
Contacts-Dept Contacts: John Dano
Contacts-Managing Dept: Engineering

## PROPOSED SCHEDULE START DATE

| | |
|---|---|
| PrePlanning | 07/01/2030 |
| PER | 07/29/2030 |
| Design Delay | 09/17/2030 |
| Design | 05/27/2031 |
| Bid Delay | 08/28/2031 |
| PreConstruction | 05/06/2032 |
| Construction | 06/16/2032 |
| Closeout | 04/13/2033 |

## COST ESTIMATE

| **Cost Estimate Class:** | |
|---|---|
| PrePlanning | $1,153,656 |
| PER | $2,884,140 |
| Design | $3,460,968 |
| PreConstruction | $576,828 |
| Construction | $49,030,380 |
| Closeout | $576,828 |
| **Est. Program Cost** | **$57,682,800** |
| Contingency Budget | $0 |
| **Est. Project Costs** | **$57,682,800** |

# Williamsburg Treatment Plant Motor Control Center Replacements

**PR_WB013300**

System: Williamsburg
Type: Electrical

Driver Category: Aging Infrastructure/Rehabilitation
Project Phase: Proposed
Regulatory: None

## PROGRAM CASH FLOW PROJECTION ($,000)

| Prog Cost | Exp to Previous Year | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $2,633 | $0 | $241 | $307 | $246 | $219 | $706 | $913 | $0 | $0 | $0 | $0 |

## PROJECT DESCRIPTION

This project is to replace eleven (11) Motor Control Centers (MCC's) that were installed in the early 1980's. The MCC's feed the Incinerator Building, Dewatering Building, Odor Control Station B, Recycle Pump Station, and Non-Potable (NPW) Building.

## PROJECT JUSTIFICATION

This project will replace MCC's that have reached the end of their useful life. The replacement parts to maintain the electrical equipment is difficult to acquire. The replacement of the MCC's will improve reliability and minimize disruptions to the plant processes. In addition, this project will reduce potential hazards to employees associated with arc flash.

## FUNDING TYPE

Funding Type: Revenue Bond

## CONTACTS

Contacts-Requesting Dept: Operations-EEM
Contacts-Dept Contacts: Sherman Pressey
Contacts-Managing Dept: Operations-EEM

## PROPOSED SCHEDULE START DATE

| | |
|---|---|
| PrePlanning | |
| PER | |
| Design Delay | |
| Design | 07/01/2026 |
| Bid Delay | |
| PreConstruction | 08/22/2022 |
| Construction | 04/15/2023 |
| Closeout | |

## COST ESTIMATE

| **Cost Estimate Class:** | **Class 5** |
|---|---|
| PrePlanning | $0 |
| PER | $0 |
| Design | $500,000 |
| PreConstruction | $0 |
| Construction | $2,133,025 |
| Closeout | $0 |
| **Est. Program Cost** | **$2,633,025** |
| Contingency Budget | $426,605 |
| **Est. Project Costs** | **$3,059,630** |