

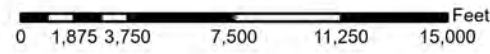


Army Base Treatment Plant



Legend

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



Army Base Treatment Plant Service Area CIP Projects

Treatment Plant Projects

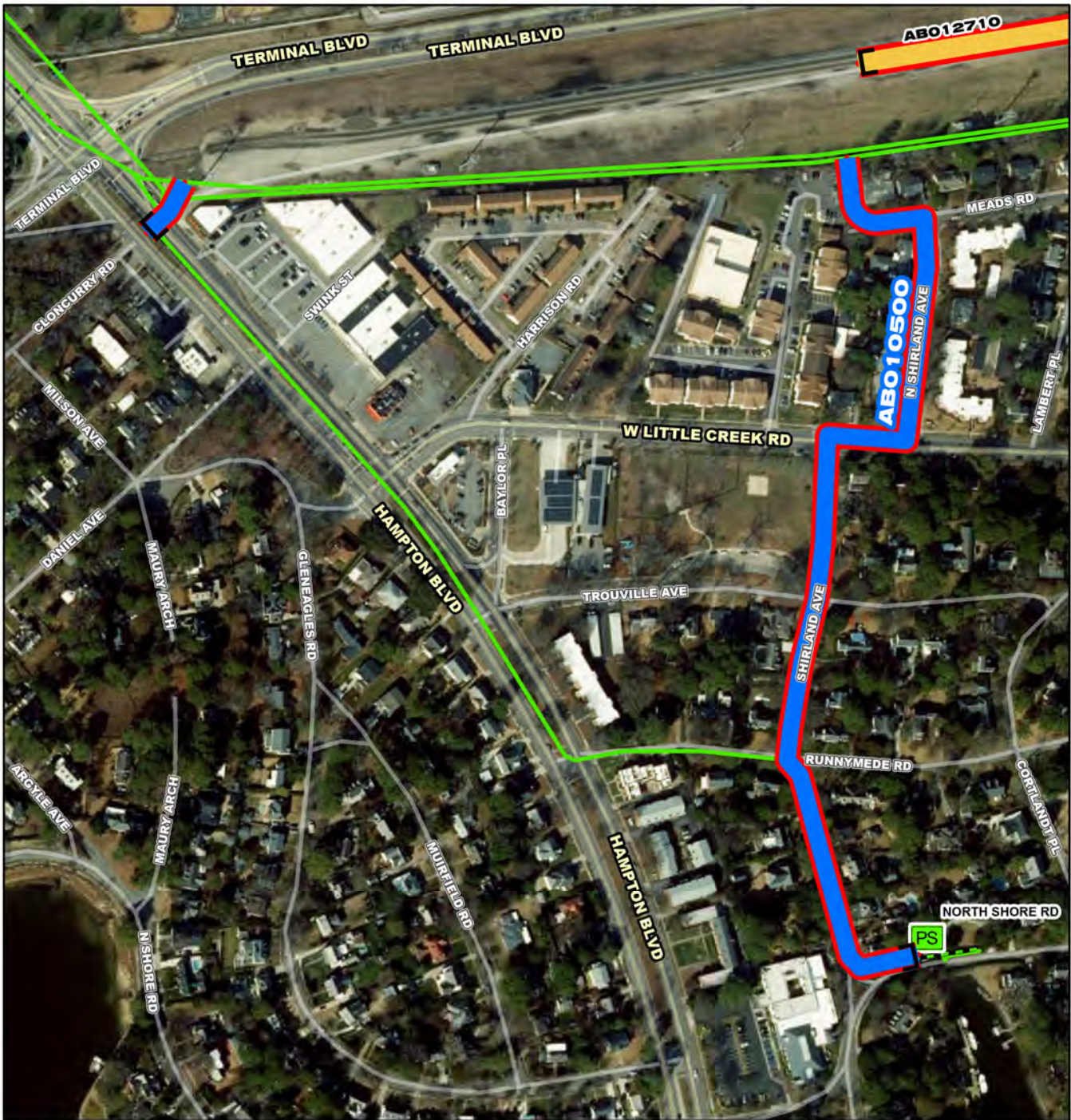
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|----------|----------|
| AB011900 | AB012600 |
| AB012100 | GN017900 |
| AB012200 | |
| AB012400 | |
| AB012500 | |



CIP Location



Service Area

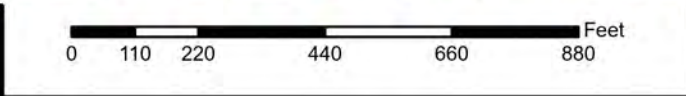


ABO 10500

- Project Interceptor Line
- Project Interceptor Point
- Project Location 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
- HRSD Treatment Plant
- HRSD Pressure Reducing Station
- HRSD Pump Station



ABO 1 0500

Section W Force Main Replacement

CIP Location

System: Army Base
 Type: Pipelines

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

PROGRAM CASH FLOW PROJECTION (\$,000)

Prog Cost	Exp to Previous Year	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36
\$4,073	\$1,490	\$2,571	\$12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

PROJECT DESCRIPTION

This project is to study, design and construct a replacement interceptor for Line SF-006, approximately 2,642 linear feet (LF) of 10-inch cast iron force main that is the discharge line from HRSD Pump Station #117 (North Shore Road). This project will include replacement main line valves, branch valves, associated appurtenances and replace the existing force main through the walls into the pump station. HART analysis has determined that this force main will be downsized from 10-inch to 8-inch.

PROJECT JUSTIFICATION

This project will replace the cast iron force main that was installed in 1948. There have been two documented repairs in 1964 and in 2005. Operations staff believes that there are additional undocumented repairs on the line, as well. The pipeline is of a material and age for which HRSD has seen recent repeated failures in other parts of the interceptor system due to wastewater chemistry and soil corrosion.

FUNDING TYPE

Funding Type: Revenue Bond

CONTACTS

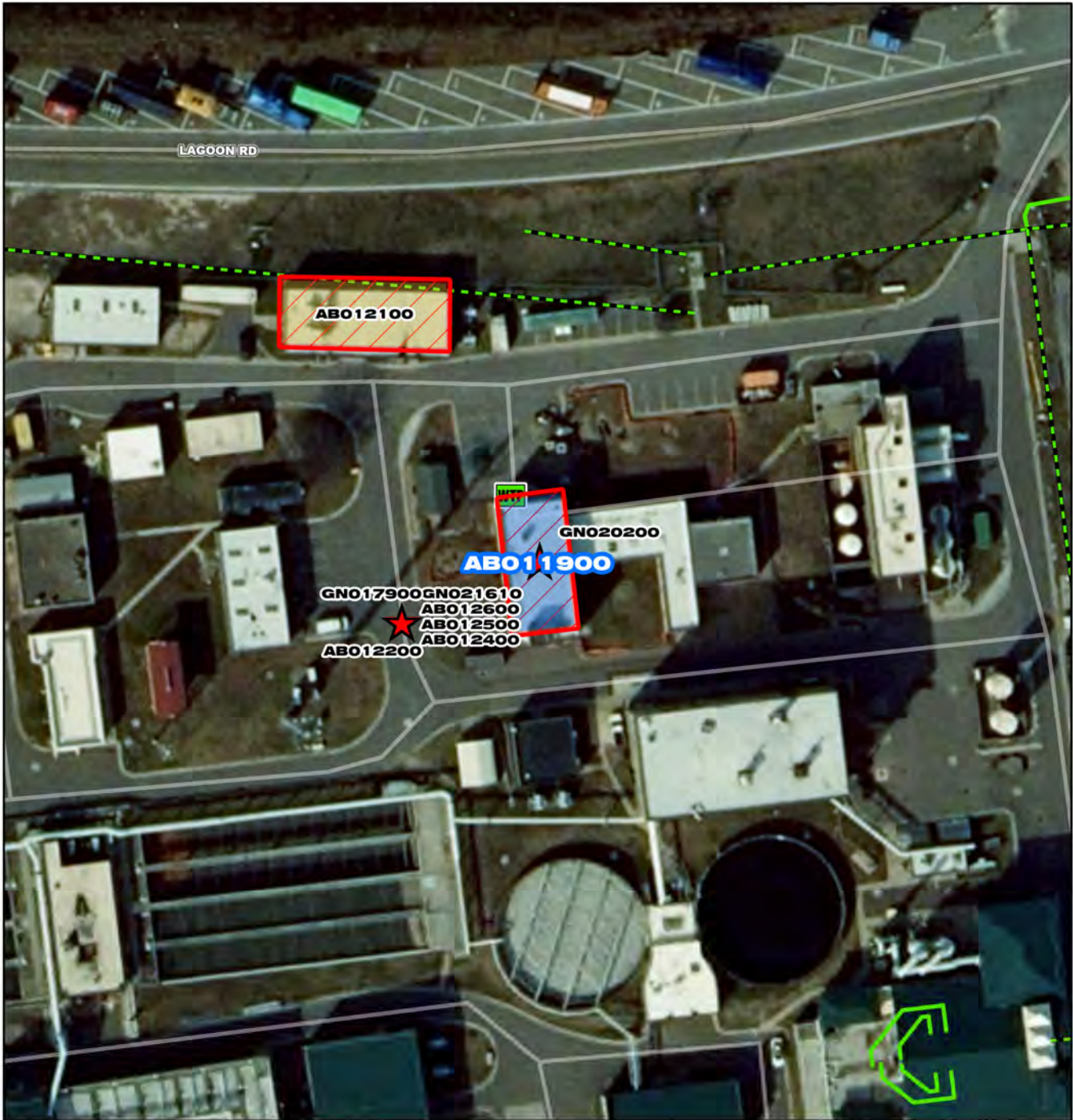
Contacts-Requesting Dept: Operations-Interceptors
 Contacts-Dept Contacts: Kayla McCoy
 Contacts-Managing Dept: Engineering

PROPOSED SCHEDULE START DATE

PrePlanning	11/01/2012
PER	06/03/2013
Design Delay	12/03/2013
Design	03/16/2021
Bid Delay	11/03/2025
PreConstruction	11/01/2025
Construction	03/01/2026
Closeout	04/01/2027

COST ESTIMATE

Cost Estimate Class:	Class 1 (-3% to +15%)
PrePlanning	\$0
PER	\$19,644
Design	\$322,474
PreConstruction	\$6,190
Construction	\$3,709,728
Closeout	\$15,000
Est. Program Cost	\$4,073,036
Contingency Budget	\$222,584
Est. Project Costs	\$4,295,620

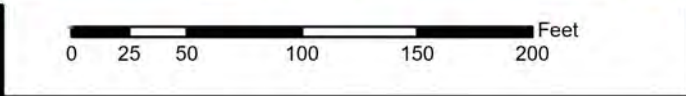


ABO11900

- Project Interceptor Line
- Project Interceptor Point
- Project Location 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
- HRSD Treatment Plant
- HRSD Pressure Reducing Station
- HRSD Pump Station



ABO 1 1 9 0 0

Army Base Treatment Plant Administration Building Renovation (2021)

CIP Location



System: Army Base
Type: Facilities, Buildings and Capital Equipment

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

PROGRAM CASH FLOW PROJECTION (\$,000)

Prog Cost	Exp to Previous Year	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36
\$11,079	\$10,496	\$583	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

PROJECT DESCRIPTION

This project is to renovate the existing administration building and electrical and instrumentation building at the Army Base Treatment Plant.

PROJECT JUSTIFICATION

This project will provide additional administration offices, lunch room, conference room, lab and control area, women and unisex bathrooms.

FUNDING TYPE

Funding Type: Revenue Bond

CONTACTS

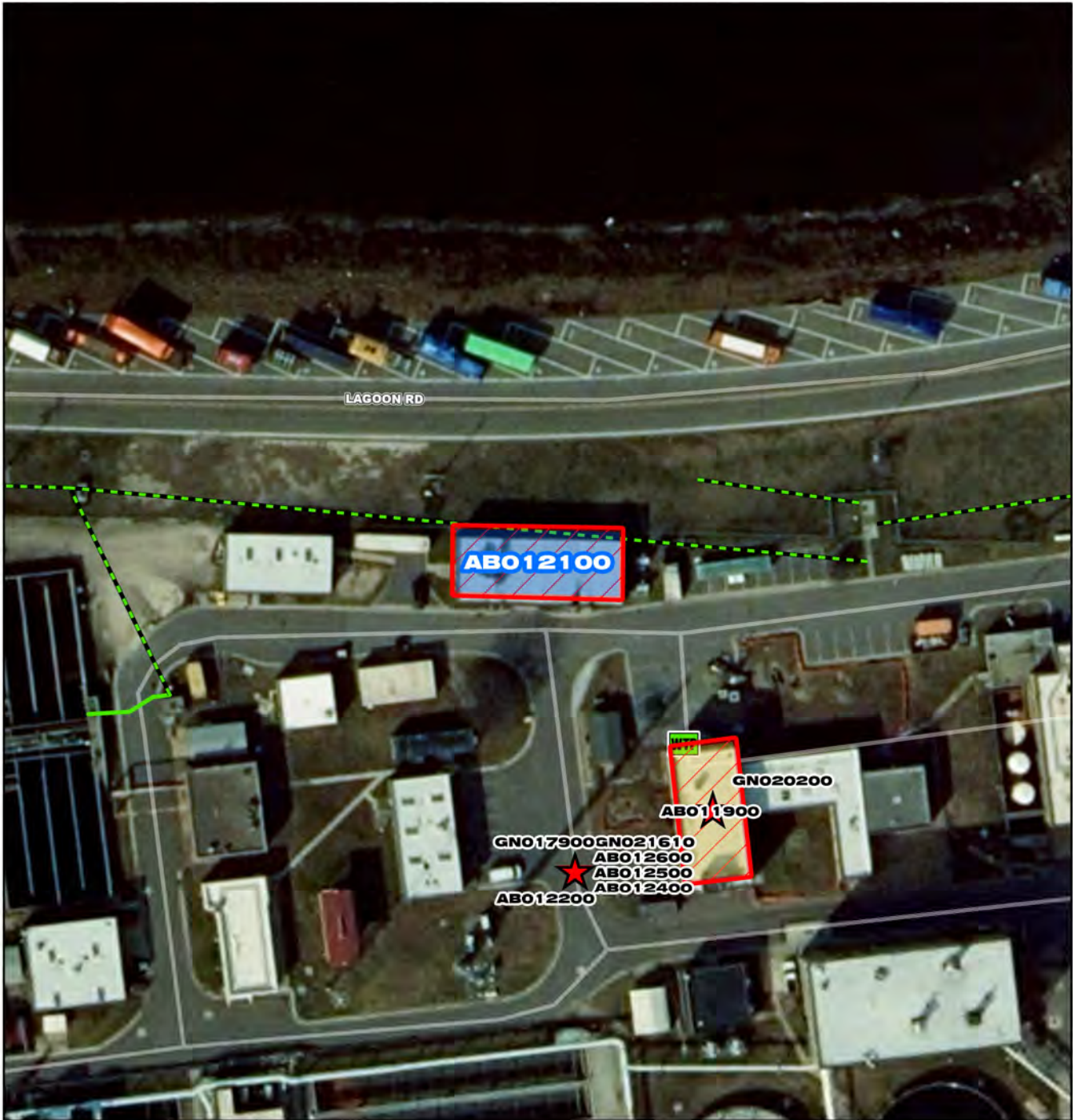
Contacts-Requesting Dept: Operations-Treatment
Contacts-Dept Contacts: Tim Marsh
Contacts-Managing Dept: Engineering

PROPOSED SCHEDULE START DATE

PrePlanning	08/10/2023
PER	02/01/2021
Design Delay	08/10/2023
Design	08/29/2022
Bid Delay	08/10/2023
PreConstruction	08/10/2023
Construction	09/01/2024
Closeout	08/01/2026

COST ESTIMATE

Cost Estimate Class:	Class 1 (-3% to +15%)
PrePlanning	\$0
PER	\$109,000
Design	\$380,330
PreConstruction	\$0
Construction	\$10,540,756
Closeout	\$48,656
Est. Program Cost	\$11,078,742
Contingency Budget	\$69,663
Est. Project Costs	\$11,148,405

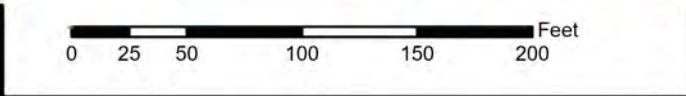


ABO12100

- Project Interceptor Line
- Project Interceptor Point
- Project Location 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
- HRSD Treatment Plant
- HRSD Pressure Reducing Station
- HRSD Pump Station



ABO12100

**Army Base Treatment Plant
Generator Control Replacement**

N
W E
S

CIP Location

System: Army Base
 Type: Electrical

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

PROGRAM CASH FLOW PROJECTION (\$,000)

Prog Cost	Exp to Previous Year	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36
\$7,664	\$270	\$2,686	\$4,682	\$26	\$0	\$0	\$0	\$0	\$0	\$0	\$0

PROJECT DESCRIPTION

This project is to design and fabricate new generator controls by retrofitting the existing generator controls that have reached the end of its useful life. The redundant programmable logic controller (PLC) has failed, and replacement parts are no longer supported. The project will include a new digital master control (DMC) panel or Generator Control Panel (GCP) for monitoring, control, and protection. The existing switchgear doors and instruments will be retrofitted with new doors and instruments. In addition, control wire modifications are necessary to interface the new equipment. The project will include the installation, testing, and commissioning of the new switchgear system.

PROJECT JUSTIFICATION

The two 4.16KV 2000 KW standby diesel Cummins generators support the treatment plants process loads in the event of a utility power loss. The standby generators are critical to maintain public health, prevent process disruptions, provide ride thru capability during inclement weather, employee safety, and maintain regulatory compliance.

FUNDING TYPE CONTACTS

Funding Type: Cash

Contacts-Requesting Dept: Operations-E&I
 Contacts-Dept Contacts: Shirley Smith
 Contacts-Managing Dept: Operations-E&I

PROPOSED SCHEDULE START DATE COST ESTIMATE

PrePlanning	08/01/2023
PER	12/29/2023
Design Delay	10/16/2024
Design	02/01/2026
Bid Delay	11/01/2026
PreConstruction	11/01/2026
Construction	02/01/2027
Closeout	04/01/2028

Cost Estimate Class:	Class 4 (-15% to +50%)
PrePlanning	\$0
PER	\$0
Design	\$296,145
PreConstruction	\$63,265
Construction	\$7,269,961
Closeout	\$34,210
Est. Program Cost	\$7,663,581
Contingency Budget	\$1,368,380
Est. Project Costs	\$9,031,961

System: General
 Type: Wastewater Treatment

Driver Category: Performance Upgrades
 Project Phase: Proposed
 Regulatory: None

PROGRAM CASH FLOW PROJECTION (\$,000)

Prog Cost	Exp to Previous Year	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36
\$1,795	\$0	\$0	\$0	\$1,795	\$0	\$0	\$0	\$0	\$0	\$0	\$0

PROJECT DESCRIPTION

This project will involve the procurement and installation of materials to implement Partial Denitrification-Anammox (PdNA) at Army Base Treatment Plant (ABTP). The design and commissioning of this system will be led by HRSD Treatment Process Engineers, and the installation will be completed by the Operations Project Team.

PROJECT JUSTIFICATION

The implementation of PdNA at ABTP will lead to chemical savings and energy savings. Current projections include \$50,000 per year in methanol, \$120,000 per year in caustic and \$11,000 per year in energy savings.

FUNDING TYPE CONTACTS

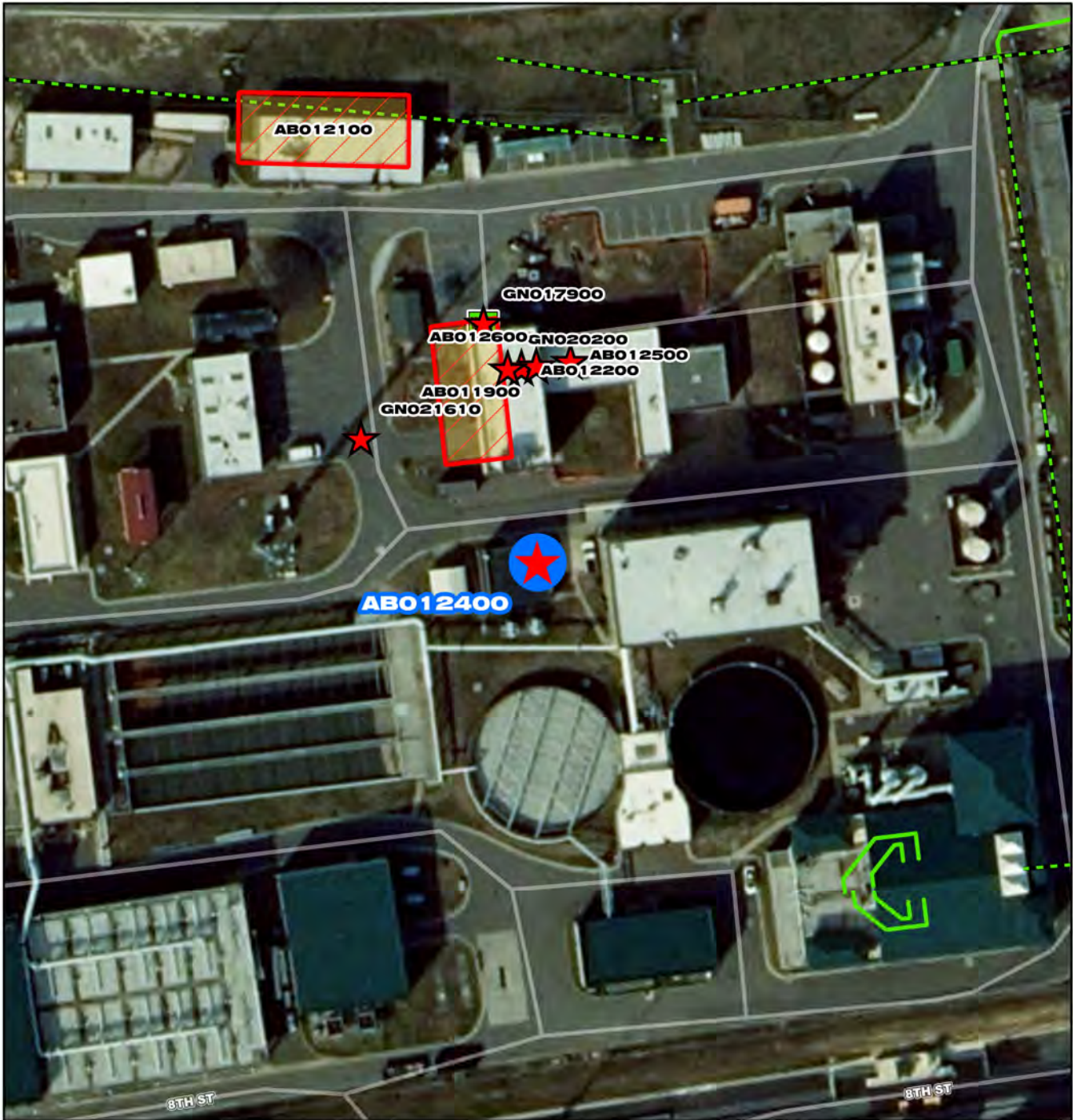
Funding Type: Revenue Bond

Contacts-Requesting Dept: Operations-Treatment
 Contacts-Dept Contacts: Matt Poe
 Contacts-Managing Dept: Operations-Treatment

PROPOSED SCHEDULE START DATE COST ESTIMATE

PrePlanning	
PER	07/01/2024
Design Delay	07/01/2024
Design	01/01/2028
Bid Delay	09/01/2028
PreConstruction	09/01/2028
Construction	01/01/2029
Closeout	03/01/2029

Cost Estimate Class:	Class 5 (-20% to +100%)
PrePlanning	\$0
PER	\$0
Design	\$0
PreConstruction	\$0
Construction	\$1,794,524
Closeout	\$0
Est. Program Cost	\$1,794,524
Contingency Budget	\$358,905
Est. Project Costs	\$2,153,429

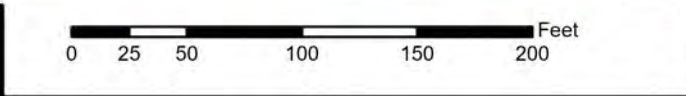


ABO 12400

- Project Interceptor Line
- Project Interceptor Point
- Project Location 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
- HRSD Treatment Plant
- HRSD Pressure Reducing Station
- HRSD Pump Station



ABO 12400

Army Base Treatment Plant Fire Suppression System Upgrades

CIP Location

System: Army Base
Type: Wastewater Treatment

Driver Category: Safety Compliance
Project Phase: Pre Construction
Regulatory: None

PROGRAM CASH FLOW PROJECTION (\$,000)

Prog Cost	Exp to Previous Year	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36
\$797	\$102	\$693	\$2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

PROJECT DESCRIPTION

This project will address the replacement or upgrades of the fire suppression system at the Army Base Treatment Plant methanol facility. Currently, the fire suppression system at this plant's methanol facility utilizes an Alcohol Resistant Aqueous Film Forming Foam (AR-AFFF) that contains Perfluoroalkyl and Polyfluoroalkyl (PFAS). Refilling the existing extinguishers with AR-AFFF will no longer be permitted due to the environmental and health concerns associated with PFAS. The new or upgraded systems will utilize a non-PFAS fluorine free foam to extinguish fires.

PROJECT JUSTIFICATION

The current methanol fire suppression systems use AR-AFFF which contains PFAS. AR-AFFF foam is being phased out due to the Federal Forever Chemical Regulation Accountability Act of 2024. If the fire suppression systems is discharged the existing system cannot be re-charged. In the past, some of these fire suppression systems have experienced false alarms and equipment malfunctions causing activation of the AR-AFFF.

FUNDING TYPE

Funding Type: Revenue Bond

CONTACTS

Contacts-Requesting Dept: Operations-Treatment
Contacts-Dept Contacts: Delane Carty
Contacts-Managing Dept: Engineering

PROPOSED SCHEDULE START DATE

PrePlanning	02/01/2026
PER	02/01/2026
Design Delay	02/01/2026
Design	02/01/2026
Bid Delay	02/01/2026
PreConstruction	02/01/2026
Construction	06/01/2026
Closeout	03/01/2027

COST ESTIMATE

Cost Estimate Class:	Class 2 (-5% to +20%)
PrePlanning	\$0
PER	\$0
Design	\$0
PreConstruction	\$15,242
Construction	\$778,260
Closeout	\$3,570
Est. Program Cost	\$797,072
Contingency Budget	\$119,561
Est. Project Costs	\$916,633

System: Army Base
 Type: Wastewater Treatment

Driver Category: NPDES Compliance
 Project Phase: Proposed
 Regulatory: Nutrient Reduction

PROGRAM CASH FLOW PROJECTION (\$,000)

Prog Cost	Exp to Previous Year	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36
\$1,520	\$0	\$13	\$1,507	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

PROJECT DESCRIPTION

This project involves installation of a formal calcium carbonate (CaCO3) system at Army Base Treatment Plant (ABTP). Bulk storage tanks, feed pumps, mixers, valves and associated piping and instrumentation will be provided by World Water Works. The existing pilot equipment will be removed by Crew Carbon, Inc. This project will be designed by HRSD staff and constructed using a combination of HRSD staff and the new on call treatment plant contractor.

PROJECT JUSTIFICATION

The Pilot Study at ABTP has shown evidence that Calcium Carbonate addition can be a viable solution not only for reducing CO2 volatilization from biological treatment, but also for improving process stability and settling behavior. Together, CaCO3 addition and hydrocyclones represent a potential strategy for intensifying the ABTP treatment process while contributing to CO2 emissions reduction, both of which have significant value. Specifically, installation of this system is part of an overall strategy to comply with new Total Phosphorus limits that will go into effect in 2032. Completion of this project also allows HRSD to continue to receive payments for carbon credits obtained through the addition of CaCO3 to the treatment process.

FUNDING TYPE CONTACTS

Funding Type: Revenue Bond

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

PROPOSED SCHEDULE START DATE COST ESTIMATE

PrePlanning	03/01/2027
PER	03/01/2027
Design Delay	03/01/2027
Design	03/01/2027
Bid Delay	09/01/2027
PreConstruction	09/01/2027
Construction	09/01/2027
Closeout	12/01/2027

Cost Estimate Class:	Class 5 (-20% to +100%)
PrePlanning	\$0
PER	\$0
Design	\$20,000
PreConstruction	\$0
Construction	\$1,500,000
Closeout	\$0
Est. Program Cost	\$1,520,000
Contingency Budget	\$300,000
Est. Project Costs	\$1,820,000

System: Army Base
Type: Electrical

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

PROGRAM CASH FLOW PROJECTION (\$,000)

Prog Cost	Exp to Previous Year	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36
\$1,273	\$0	\$0	\$0	\$1,273	\$0	\$0	\$0	\$0	\$0	\$0	\$0

PROJECT DESCRIPTION

This project is to update key elements for the Emerson Distributed Control System (DCS) Treatment Plants across HRSD utilizing the Emerson "Evergreen" program. This manages and eliminates system obsolescence by ensuring key elements of the control system are updated with the latest validated software, workstations, networks, I/O, security, High-Performance Graphics, and optimization technology. This upgrade will effectively protect the initial system investment, therefore prolonging and sustaining the system's life. Each treatment plant will require regular upgrades under the Evergreen program every seven (7) years beginning in FY 2027.

PROJECT JUSTIFICATION

A technological "refresh" of DCS components at HRSD treatment plants is a necessary investment to ensure that the control systems are maintained in a reliable manner. This refresh extends the life of our investment by sustaining current, or incorporating new, technology in the system. It addresses the changing needs of system security requirements and includes security features to comply with newly instituted regulations, avoids emerging maintenance issues caused by aging technology, and adopts new I/O or digital bus technology and takes advantage of the associated asset maintenance and management tools.

FUNDING TYPE

Funding Type: Revenue Bond

CONTACTS

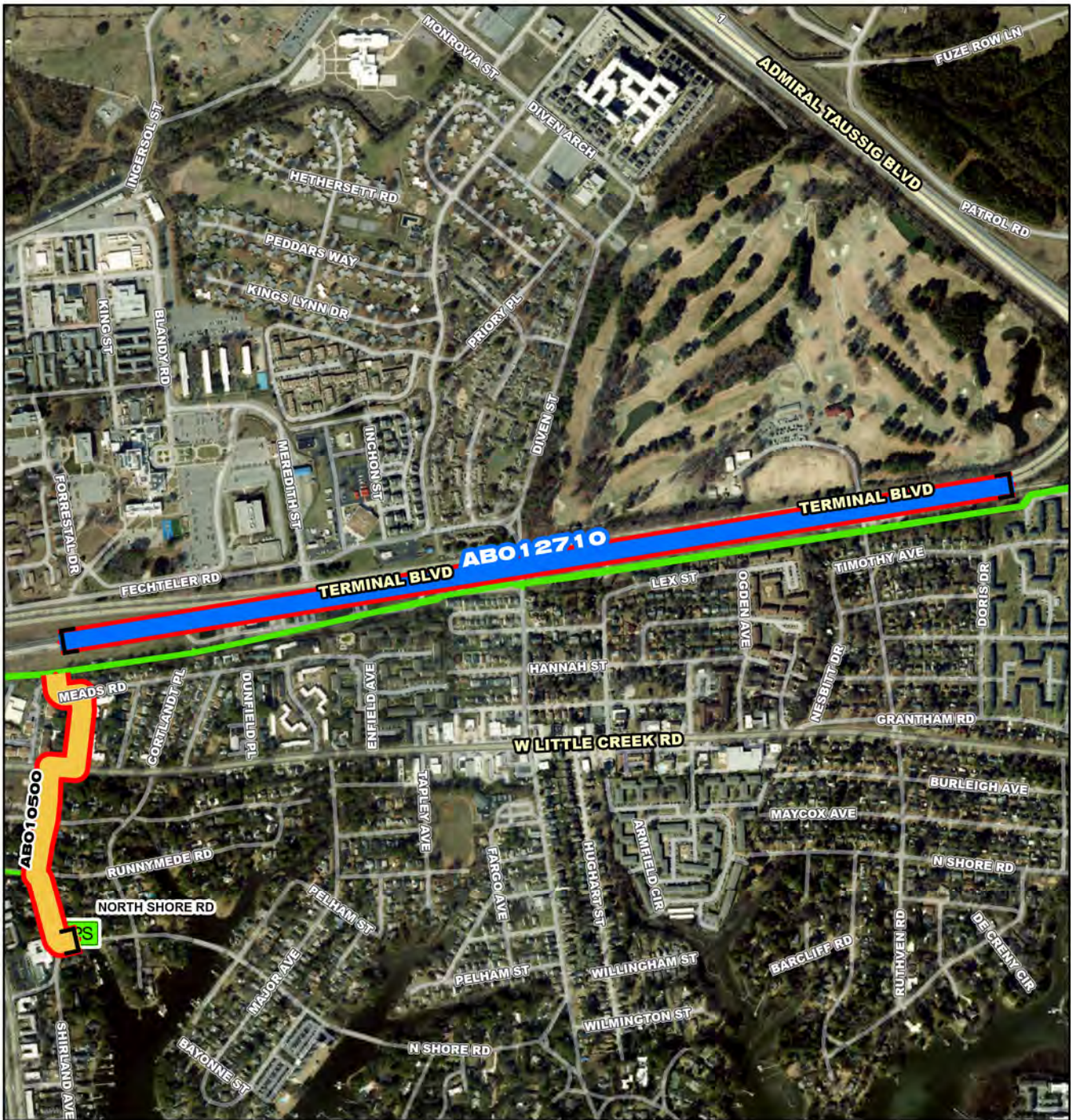
Contacts-Requesting Dept: Operations-E&I
Contacts-Dept Contacts: Shawn Hawley
Contacts-Managing Dept: Operations-E&I

PROPOSED SCHEDULE START DATE

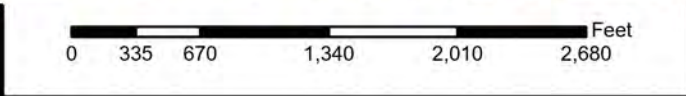
PrePlanning	07/01/2028
PER	07/01/2028
Design Delay	07/01/2028
Design	07/01/2028
Bid Delay	07/01/2028
PreConstruction	07/01/2028
Construction	07/01/2028
Closeout	07/01/2029

COST ESTIMATE

Cost Estimate Class: Class 5 (-20% to +100%)	
PrePlanning	\$0
PER	\$0
Design	\$0
PreConstruction	\$0
Construction	\$1,273,437
Closeout	\$0
Est. Program Cost	\$1,273,437
Contingency Budget	\$318,359
Est. Project Costs	\$1,591,796



- ABO 12710**
- Project Interceptor Line
 - Project Interceptor Point
 - Project Location 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
 - HRSD Treatment Plant
 - HRSD Pressure Reducing Station
 - HRSD Pump Station



ABO 12710

**Terminal Boulevard Force Main
Corridor Improvements Study**



System: Army Base
 Type: Pipelines

Driver Category: Performance Upgrades
 Project Phase: Proposed
 Regulatory: None

PROGRAM CASH FLOW PROJECTION (\$,000)

Prog Cost	Exp to Previous Year	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	FY35	FY36
\$75	\$0	\$75	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

PROJECT DESCRIPTION

This project will perform a feasibility study to evaluate alternatives for addressing mature trees located in close proximity to, or directly above, the Army Base Interceptor Force Main along Terminal Avenue in Norfolk within the South Shore Interceptor System. The study area extends approximately 2,082 feet and is characterized by dense vegetation, including mature trees and significant understory growth. The corridor includes service connections within adjacent residential properties, and easement and property ownership information is unclear in portions of the alignment. The study will evaluate feasible alternatives, including, but not limited to, clearing vegetation above existing pipelines, relocating one or more pipelines within the railroad right-of-way, abandoning pipelines in place, and combinations of these approaches. Stakeholder considerations, including coordination with the railroad and affected property owners, will be identified and incorporated into the evaluation. General Engineering Services will be utilized to perform this study. An opinion of probable cost will be developed for each alternative.

PROJECT JUSTIFICATION

This project will address significant operational, maintenance, and reliability challenges associated with dense tree cover, extensive root systems, limited access points, and proximity to residential properties and active railroad operations, despite the pipelines currently being in good structural condition. Dense vegetation restricts routine inspection and limits emergency access in the event of a failure. Large trees and root systems increase the risk of damage during storm events, maintenance activities, or emergency repairs. Inaccessible infrastructure during emergencies may result in delayed response, prolonged service disruptions, increased property damage, and elevated public safety risk. In addition, unclear easement and property ownership boundaries complicate long-term asset management and future maintenance planning. Without a proactive evaluation and mitigation strategy, continued reliance on reactive maintenance in this corridor will increase system vulnerability and operational risk. This study will provide the technical and planning basis needed to identify cost-effective solutions and support long-term system reliability.

FUNDING TYPE CONTACTS

Funding Type: Cash

Contacts-Requesting Dept: Operations-Interceptors
 Contacts-Dept Contacts: Shawn Heselton
 Contacts-Managing Dept: Operations-Interceptors

PROPOSED SCHEDULE START DATE COST ESTIMATE

PrePlanning	07/01/2026
PER	07/01/2027
Design Delay	07/01/2027
Design	07/01/2027
Bid Delay	07/01/2027
PreConstruction	07/01/2027
Construction	07/01/2027
Closeout	07/01/2027

Cost Estimate Class:	Class 1 (-3% to +15%)
PrePlanning	\$75,000
PER	\$0
Design	\$0
PreConstruction	\$0
Construction	\$0
Closeout	\$0
Est. Program Cost	\$75,000
Contingency Budget	\$0
Est. Project Costs	\$75,000