Public Notice

U.S. Army Corps of Engineers
Baltimore District
PN-23-31

In Reply to Application Number
NAB-2019-00357-M37 (Tennyson Mitigation Bank)

Comment Period: July 27, 2023 to August 26, 2023

THE PURPOSE OF THIS PUBLIC NOTICE IS TO SOLICIT COMMENTS FROM INTERESTED PARTIES CONCERNING THE PROSPECTUS FOR DEVELOPMENT OF A PRIVATE COMMERCIAL COMPENSATORY MITIGATION BANK.

The Baltimore District, United States Army Corps of Engineers (Corps) has received a complete prospectus pursuant to the 2008 Mitigation Rule (33 CFR 332) proposing to establish a compensatory mitigation bank (Bank) and generate mitigation credits to offset unavoidable impacts to waters of the United States (WOUS) authorized under Section 404 of the Clean Water Act (33 USC 1344), The proposed Bank may also provide alternative types of mitigation for Corps civil works projects as well as mitigation in connection with resolving Clean Water Act enforcement cases. In addition, the proposed Bank may be used to generate compensatory mitigation credits to offset unavoidable impacts to wetland and/or waters regulated by the State of Maryland.

BANK SPONSOR:

Olu Okunola, Director
Maryland Department of Transportation
State Highway Administration
Office of Real Estate
707 North Calvert Street
Baltimore, Maryland 21202

WATERWAY AND LOCATION OF THE PROPOSED BANK:

The Tennyson Bank is located near Scotland, St. Mary's County, Maryland on Tennyson Lane. The project site is in the Severn Service Area identified as Hydrologic Unit Code (HUC 02060004) in the Atlantic Coastal Plain Level III ecoregion. The project location coordinates are: 38.090174, -76.354123. See pages 3, 6, and 11 of the Prospectus for vicinity maps and page 15 for the service area map.

OVERALL PROJECT PURPOSE:

The primary purpose of the Bank is to provide commercial compensatory wetland mitigation credits for unavoidable impacts to streams and nontidal wetlands authorized under Section 404 of the Clean Water Act.

The linked amendment request (entitled as “Tennyson Mitigation Bank Prospectus 5.31.2023”) provides a summary of the development of the Bank and initiates the Corps’ review associated with establishment of this Bank. The proposed bank, including associated approved site-specific mitigation plans, is the legal document for the establishment, operation, and use of the maintenance of the Bank in a way that complies with the regulations governing compensatory mitigation for activities authorized by the Department of the Army (DA) permits granted by the Corps.

Pursuant to 33 CFR 332.8(d)(4), the Corps has posted a full copy of the subject prospectus online so that it is available for review by the public. The prospectus may be downloaded from the Regulatory In-Lieu Fee and Bank Information Tracking System at web address:

https://ribits.ops.usace.army.mil/ords/f?p=107:278:8892267579120:::RP,278:P278_BANK_ID:5420

PROJECT DESCRIPTION:

The proposed establishment of this 5.21-acre Bank site involves the re-establishment and enhancement of wetlands and preservation and enhancement of wetland buffers. The bank sponsor proposes that ecological lift associated with establishment of this mitigation bank, including wetland re-establishment, forest planting, and invasive species control, and wetland preservation would generate wetland credits that are to provide off-site compensatory mitigation for activities authorized under a DA permit for Maryland Department of Transportation. This mitigation bank is proposed as a portion of a larger wetland mitigation project to fulfill specific project needs for MDOT SHA. These “permittee responsible” mitigation areas were authorized by separate DA permits. The total mitigation area (including the Bank) is 13.59 acres. This includes wetland restoration, wetland enhancement, and wetland buffer preservation and enhancement. The following is a list of project objectives as described by the bank sponsor:

- Restore 4.07 Acres of forested wetlands.
- Enhance 0.14 Acres of forested wetlands.
- Enhance approximately 1,464 sq. ft. of wetland buffers.
- Preserve 762 sq. ft. of wetland buffers.
- The Bank will expand existing FIDS Habitat (Forest Interior Dwelling Species) through establishment of wetland forests in lands that are currently maintained as crop fields or fallow fields.

- The Bank is proposed to be protected in perpetuity via recordation of a real estate instrument such as a conservation easement or restrictive covenant.

- Upon Bank closure, the Bank is proposed to be managed long term by a third-party long-term steward, and if not identified, the bank sponsor will retain the legal responsibility for long-term management of the Bank site.

PROPOSED SERVICE AREA:

The service area of a Bank is a geographic area, such as a watershed or ecoregion, within which the mitigation bank is authorized to provide compensatory mitigation required by DA permits. The proposed primary Service Area is the Severn Service Area (HUC 02060004). The secondary service area is the coastal plan sections of the Patuxent River Watershed (HUC 02070011) and Gunpowder-Patapsco Watershed (HUC 02060003). The secondary service area was chosen because of the proximity of the proposed bank's location and similar geography in relation to other watersheds.

The use of the secondary service area would be considered by the Corps only when credits are not available from another approved mitigation bank within the primary service area and the applicant demonstrates that the mitigation credits will replace the lost aquatic functions and services at the impact site. Impacts to coastal and tidal aquatic resources would generally be excluded from mitigating at this nontidal bank.

MITIGATION BANK APPROVAL AND PERMITTING PROCESSES:

This Bank may be one of a number of practicable options available to applicants to compensate for unavoidable impacts associated with permits issued under the authority of Section 404 of the Clean Water Act. Released mitigation bank credits are generally the preferred option for compensatory mitigation because Banks consolidate resources, involve more financial planning and scientific expertise, and must meet certain performance standards, thereby reducing risks associated with mitigation projects. Approval to use an approved Bank site to offset impacts for a specific project is the decision of the Corps pursuant to Section 404 of the Clean Water Act. The Corps provides no guarantee that any particular individual or general permit will be granted authorization to use an approved Bank site to compensate for unavoidable impacts associated with a proposed permit. Authorization by the Maryland Department of the Environment may also be required to use this Bank to offset specific impacts regulated by the State of Maryland.

Issuance of a public notice regarding proposed Bank sites is required pursuant to 33 C.F.R. § 332.8(d)(4) and 40 C.F.R. § 230.98(d)(4). The proposed establishment of the bank will be evaluated pursuant to the 2008 Mitigation Rule (33 CFR Part 332).

The Sponsor must obtain the appropriate federal, state, and local permits required to implement the Bank construction activities. The bank sponsor has received Corps authorization to complete the work under a previous permit authorization with wetland mitigation requirements. The Corps will continue consultation, if appropriate, under the Endangered Species Act, the National Historic Preservation Act, and other applicable federal laws, prior to any modified DA permit authorization for construction of the Bank site.

Based upon a preliminary review of the prospectus, and the applicable permits, the proposed work to develop the Bank site will result in temporary and/or permanent impacts to WOUS or work within navigable WOUS and the Corps issued a Standard Permit to authorize the impacts. The Standard Permit has undergone a full public interest review as required by Corps regulations (33 CFR 320.4(a)), and National Environmental Policy Act documentation has been prepared that addresses environmental considerations.

EFFECTS ON AQUATIC RESOURCES:

The proposed work would result in approximately 4.07 acres of nontidal forested wetland restoration, 0.14 acres of nontidal forested wetland enhancement, 1,464 sq. ft. of wetland buffer enhancement, and 762 sq. ft. of wetland buffer preservation. The project will temporarily impact approximately 55 square feet emergent nontidal wetland.

LEAD FEDERAL AGENCY:

The Corps, as the lead federal agency, is responsible for all coordination pursuant to applicable federal authorities.

The Interagency Review Team (IRT) responsible for review, approval, and oversight of the proposed mitigation bank includes representatives from the Corps, the United States Environmental Protection Agency, the United States Fish and Wildlife Service, the National Marine Fisheries Service, the Maryland Department of Natural Resources, the Maryland Department of the Environment, the Maryland Historic Trust. The Baltimore District of the Corps chairs the IRT and the Maryland Department of the Environment co-chairs the IRT.

ENDANGERED SPECIES:

A preliminary review of this prospectus indicates that the proposal is not likely to adversely affect federally listed threatened or endangered species or their critical habitat, pursuant to Section 7 of the Endangered Species Act, as amended. As the evaluation of this application continues, additional information may become available which could modify this preliminary determination.

ESSENTIAL FISH HABITAT:

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 04-267), requires all federal agencies to consult with the National Marine Fisheries Service (NMFS) on all actions, or proposed actions, permitted, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH), including species of concern, life cycle habitat, or Habitat Areas of Particular Concern. The project site lies in or adjacent to EFH as described under MSFCMA for managed species under the MSFCMA. The Baltimore District has made a preliminary determination that the project is not within on EFH and will have no effect on EFH.

HISTORIC RESOURCES:

Pursuant to Section 106 of the National Historic Preservation Act of 1966 and applicable guidance, the Corps has reviewed the latest published version of the National Register of Historic Places and initially determined that no properties listed or eligible for inclusion, in the National Register of Historic Places, are located at the site of the proposed Bank. The Corps has made the preliminary determination that the proposed project has no potential to cause effects on historic properties. The Corps final eligibility and effect determination will be based on coordination with the State Historic Preservation Office as appropriate and required, and with full consideration given to the proposed undertaking's potential direct and indirect effects on historic properties within the Corps' identified permit area.

TRIBAL RESOURCES:

Section 106 of the National Historic Preservation Act also requires federal agencies to consult with federally recognized American Indian tribes that attach religious and cultural significance to historic properties that may be affected by the agency's undertaking. Corps Tribal Consultation Policy mandates an open, timely, meaningful, collaborative, and effective deliberative communication process that emphasizes trust,

respect, and shared responsibility. The policy further emphasizes that, to the extent practicable and permitted by law, consultation works toward mutual consensus and begins at the earliest planning stages before decisions are made and actions taken. The Corps final eligibility and effect determination will be based on coordination with interested tribes, in accordance with the Corps current tribal standard operating procedures as appropriate and required, and with full consideration given to the proposed undertaking's potential direct and indirect effects on tribal resources.

MODIFICATION OF CIVIL WORKS PROJECTS: 33 USC 408 (SECTION 408):

All Section 408 proposals will be coordinated internally at the Corps. The Section 408 decision will be issued along with the Section 404 and/or Section 10 decision. Please see the following link for more information regarding Section 408: https://www.nab.usace.army.mil/Missions/Regulatory/Section-408-Requests/

The applicant must obtain any state or local government permits which may be required.

NOTE:

This public notice is being issued based on information furnished by the bank sponsor. This information has not been verified or evaluated to ensure compliance with laws and regulation governing the regulatory program.

REQUEST FOR PUBLIC HEARING:

Any person may request a public hearing. The request must be submitted in writing to the district engineer within the designated comment period of the notice and must state the specific reasons for requesting the public hearing.

SUBMISSION OF COMMENTS:

The Corps is soliciting comments from the public; federal, state, and local agencies and officials; Indian Tribes; and other interested parties to help inform the Corps and the IRT as to the overall merits of the proposed Bank, the scope of the proposed mitigation bank, the delineation of the proposed service area, the ecological suitability of the Bank site to achieve restoration of WOUS, and to identify project aspects that should be addressed during the development of a draft mitigation banking instrument. Any comments received will be considered by the Corps to determine whether the proposal has the potential to provide mitigation opportunities for project proponents (permittees)

authorized to impact WOUS under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act or as a means of resolving Section 404 and/or Section 10 enforcement actions. Comments provided will become part of the public record for this action and are subject to release to the public through the Freedom of Information Act.

Written comments concerning the proposed Bank must be received within the comment period specified above through postal mail at the address below or electronic submission to the project manager's email address below. All comments should reference the Application Number NAB-2019-00357-M37.

Mr. Nick Ozburn
U.S. Army Corps of Engineers, Baltimore District
Regulatory Branch
2 Hopkins Plaza
Baltimore, MD 21201
nicholas.r.ozburn@usace.army.mil

Please share this information concerning the proposed work with any persons known by you to be interested, who did not receive a copy of this notice.

General information regarding the Corps' permitting and mitigation processes can be found on our website at https://www.nab.usace.army.mil/Missions/Regulatory.aspx. This public notice has been prepared in accordance with Corps implementing regulations at 33 CFR 325.3. If you have any questions concerning this specific project, or would like to request a paper copy of this public notice, please contact Nick Ozburn, at (410) 395-4662 or by email at nicholas.r.ozburn@usace.army.mil. This public notice is issued by the Chief, Regulatory Branch.

Addendum 5: Umbrella Mitigation Banking Instrument
Tennyson Mitigation Bank Prospectus

St. Mary's County, Maryland

Sponsor:

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

707 North Calvert Street
Baltimore, MD 21202

COASTAL RESOURCES INC.

25 Old Solomons Island Road
Annapolis, MD 21401

Prepared by:

WBCM
Designing Infrastructure for Tomorrow®

300 East Joppa Road, Suite 200
Baltimore, MD 21286

Interagency Review Team

U.S. Army Corps of Engineers Baltimore District-Chair
Maryland Dept. of the Environment, Wetlands and Waterways Program-Co-Chair
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
National Marine Fisheries Service
Maryland Department of Natural Resources
Chesapeake Bay Critical Areas Commission
Maryland Historic Trust

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I. Introduction

The Maryland Department of Transportation State Highway Administration (MDOT SHA), the Bank Sponsor, proposes to establish the Tennyson Mitigation Bank as Addendum 5 to the Maryland State Highway Administration Umbrella Mitigation Banking Instrument (MDOT SHA-UMBI). Eric Freidly will serve as the MDOT SHA bank sponsor contact. The Tennyson Site (the Site) is located in St. Mary's County, Maryland, on Tennyson Lane approximately 0.5 miles east of Scotland, MD (Figure 1) and includes both an approved mitigation site and excess credit from which the proposed Tennyson Mitigation Bank will be developed The Tennyson Mitigation Bank is to be constructed in 2023 (Contractor received NTP May 8, 2023) with the goal to provide wetland mitigation credits. The purpose of the MDOT SHA-UMBI is to provide compensatory mitigation for unavoidable impacts to wetlands and their functions as a result of activities authorized under Section 401 and 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, Maryland Nontidal Wetlands Protection Act, and Department of Army Permits provided such activities have met all applicable requirements and are authorized by the appropriate agencies. The Tennyson Mitigation Bank is the fifth bank proposed to be added to the MDOT SHA-UMBI.

II. Phasing

The MDOT SHA-UMBI has been submitted and approved by the Interagency Review Team (IRT). The Mitigation Site Plan (MSP) for the Tennyson Mitigation Bank will be attached as an addendum to the existing MDOT SHA-UMBI and the Tennyson Mitigation Bank will be deemed a component of the MDOT SHA-UMBI. Credits will be released consistent with the schedule of credit availability in accordance with the final MSP and the MDOT SHA-UMBI. Credits released for the Tennyson Mitigation Bank will be accounted for in the overall Bank ledger for the MDOT SHA-UMBI.

III. Mitigation Bank

a) Project Goals and Objectives

The Tennyson Mitigation Bank is surplus wetland restoration and enhancement area within the Site. The Tennyson Mitigation Bank portion is contiguous to the approved MD 5 Wetland Mitigation Areas (See Figure 5). The MD 5 Wetland Mitigation portion of the Site serves to provide 4.03 acres of nontidal wetland mitigation credit for MDOT SHA project (SM774) *MD 5 Point Lookout Road from the Causeway to South of Camp Brown Road* (MD 5 Point Lookout project), and 2.51 acres of advanced mitigation credit for MDOT SHA *(SM351) MD 4 Thomas Johnson Bridge* project (MD 4 Bridge Project) (Table 1). Regulatory approval of the MD 5 Wetland Mitigation Area, including advanced credit for the MD 4 Bridge project, were granted under Maryland Department of the Environment (MDE) authorization 17-NT-0456 and U.S. Army Corps of Engineers (ACOE) authorization 2017-62002-M24. These authorizations acknowledge the potential surplus wetland mitigation credit, which is proposed as the Tennyson Mitigation Bank. The goal of the Tennyson Mitigation Bank is to provide a self-sustaining, functional wetland to replace the functions and values lost from adverse impacts to wetlands due to various permitted MDOT SHA projects within its defined Service Areas. The Tennyson Mitigation Bank also serves to provide advanced functional replacement of future functional losses due to unavoidable impacts and thus serves to eliminate temporal loss that results from alternative mitigation approaches.

b) Site Selection/Background

The Site, shown in Figure 2, was initially selected as a compensatory mitigation site for impacts associated with the MD 5 Point Lookout project located within approximately 0.5 miles of the Site, and the MD 4 Bridge project located within approximately 17 miles. The Site includes both the MD 5 Wetland Mitigation Area and the proposed Tennyson Mitigation Bank. The Site totals 13.59 acres and is privately owned by Mr. Paul Tennyson. Field investigations performed at this site include existing wetland delineation, monitoring for hydrology using installed wells, and soil analysis that included soil texture and chemical analyses. The Site was designed to supplement water quality, hydrological, and biological functions in the watershed impacted by the MD 5 Point Lookout roadway project. These functions include filtering sediments, pollutants, and excess nutrients; discharging and recharging groundwater; providing wildlife habitat; and furnishing organic matter to the aquatic food web. The Site is fully encumbered by a Maryland Agricultural Land Preservation Foundation easement (MALPF) and lies immediately upstream of the Deep Creek floodplain. The Site protects, improves, and significantly increases the wetland footprint in the area and provides functions, including sediment, pollutant, and nutrient attenuation and transformation; groundwater recharge and discharge; and wildlife habitat. Specifically, the low-lying topography of the proposed Site will allow for wetland creation with only minor grading required. The juxtaposition of the Site with both adjacent forested wetlands offsite and agricultural land onsite, provides a unique opportunity to expand contiguous forested wetland habitat in the area and to help buffer downstream receiving waters from agricultural runoff. The Site, as designed, will also provide a diverse oak-dominated forested wetland in a surrounding area where many of the larger oaks have been logged and loblolly pine (*Pinus taeda*) has replaced the typical oak climax community. Oaks host a large number and variety of invertebrates essential for many species of songbirds, including forest interior dwelling bird species (FIDS). The Tennyson Mitigation Bank will expand existing FIDS habitat contiguous to the northwest.

MDOT SHA is seeking to restore 10.38 acres of wetland, enhancing 0.62 acres of existing wetland and 0.54 acres of wetland buffer, and preserving 1.42 acres of wetland buffer at the Site. As authorized, the MD 5 Point Lookout project and the MD 4 Bridge project require 3.76 and 2.46 acres of wetland mitigation credit, respectively. The 3.76 acres of mitigation required for the MD 5 Point Lookout project includes 3.73 acres of direct project impact compensation plus 0.03 acres of compensation for permanent palustrine emergent wetland impacts proposed during construction of the Tennyson mitigation site, permitted as part of the MD 5 permit (17-NT-0456/17-WP-1130/201762002). MDOT SHA is proposing to allocate 4.03 credits from the Site for the MD 5 Point Lookout project and 2.51 credits for the MD 4 Bridge project. MDOT SHA is proposing the remaining 4.26 credits (see Table 1) of restoration, enhancement, and preservation to be established as the Tennyson Mitigation Bank due to the factors of a cooperative property owner, connection to an existing wetland, and the sustainability of the site for wetland restoration. As noted above, the Site also extends an existing FIDS habitat located to the northwest. The functions provided by the wetland system will aid to offset losses from future development in the region and provide water quality benefits for the current agricultural land use within the drainage area of the Site.

Figure 1 - Tennyson Site Vicinity Map

Table 1 - Tennyson Wetland Mitigation Bank Project Information		
Bank Sponsor and Property Owner		Eric Freidly MDOT SHA, Office of Environmental Design, 707 N. Calvert Street, Baltimore, MD 21202 410-545-8610 efreidly@mdot.maryland.gov
Property Information		
Location		38°05'23" N, 76°21'16" W
Basin		Upper Chesapeake (02-06)
Sub-basin/Primary HUC Service Area		Severn HUC (02060004)
Secondary HUC Service Areas		Patuxent (02060006) & Gunpowder-Patapsco (02060003) (Atlantic Coastal Plain physiographic region only)
Mitigation Site Plan		
PFO Restored Wetlands		452,349 SF (10.38 AC)
PFO Wetland Enhancement		27,186 SF (0.62 AC)
PFO Wetland Buffer Enhancement		23,655 SF (0.54 AC)
PEM Wetland Buffer Preservation		61,960 SF (1.42 AC)
Wetland Mitigation Credits		
PFO Restoration (1:1)		452,349 SF (10.38 AC)
PFO Enhancement (2:1)		13,593 SF (0.31 AC)
PFO Wetland Buffer Enhancement (15:1)		1,577 SF (0.04 AC)
PEM Wetland Buffer Preservation (20:1)		3,098 SF (0.07 AC)
Total Wetland Mitigation Credits		**470,617 (10.8 AC)**
Credit from MD 5 Point Lookout (-1:1)[1]	PFO Restoration	167,251 SF (3.84 AC)
	PFO Enhancement	6,780 SF (0.15 AC)
	PFO Wetland Buffer Enhancement	0 SF (0 AC)
	PEM Wetland Buffer Preservation	1,599 SF (0.04 AC)
	Total	**175,630 SF (4.03 AC)**
Advanced Credit from MD 4 Thomas Johnson Bridge (-1:1)	PFO Restoration	107,855 SF (2.48 AC)
	PFO Enhancement	582 SF (0.01 AC)
	PFO Wetland Buffer Enhancement	113 SF (0.003 AC)
	PEM Wetland Buffer Preservation	737 SF (0.02 AC)
	Total	**109,287 SF (2.51 AC)**
Credits at the Tennyson Mitigation Bank	PFO Restoration	177,243 SF (4.07 AC)
	PFO Enhancement	6,231 SF (0.14 AC)
	PFO Wetland Buffer Enhancement	1,464 SF (0.03 AC)
	PEM Wetland Buffer Preservation	762 SF (0.02 AC)
	Total	**185,700 SF (4.26 AC)**

[1]Includes 0.03 acres of permanent impact associated with construction of the Tennyson mitigation site

The Site topography is characterized as gently sloping northwest to southeast from an elevation of 12 feet above mean sea level to 8 feet above mean sea level, respectively. The wetland delineation is provided in Appendix A: Tennyson Wetland Delineation Report.

Currently, the design phase of the wetland mitigation has been completed and is pending construction, scheduled to begin in May 2023. The Site plans are found in Appendix B and include the proposed conditions. Site baseline information and an aerial view of the Site can be found in Section III d. The Geographic Service Area, both Primary and Secondary Service Areas, are in accordance with the MDOT SHA-UMBI. A Service Area Map illustrating the Primary and Secondary Service Areas for the Tennyson Mitigation Bank is included in Section III m.

c) Site Protection Instrument

The Tennyson Mitigation Bank protections are proposed via a perpetual easement to be held by MDOT SHA, referred to as the Tennyson Grant of Mitigation Easement (Appendix E). Access to the Site required for construction, post construction monitoring, and long-term maintenance is perpetually provided to MDOT SHA and to the environmental agencies and included in the easement. The easement language perpetually restricts areas of grading and planting from grazing, timber harvest, drainage alterations, building structures, and any kind of development, as required by environmental regulations. Perpetual vehicular access is required to the site and cannot be obstructed by structures or other permanent obstructions.

The Site is also under a MALPF easement. The Grant of Mitigation Easement was overlaid onto the MALPF easement on April 29, 2020, and the document stipulates that the Grant of Mitigation Easement is limited to the Mitigation Area, Temporary Easement Area, and Access Area. It does not burden or restrict remaining land encumbered by the MALPF, whose agricultural integrity will be preserved.

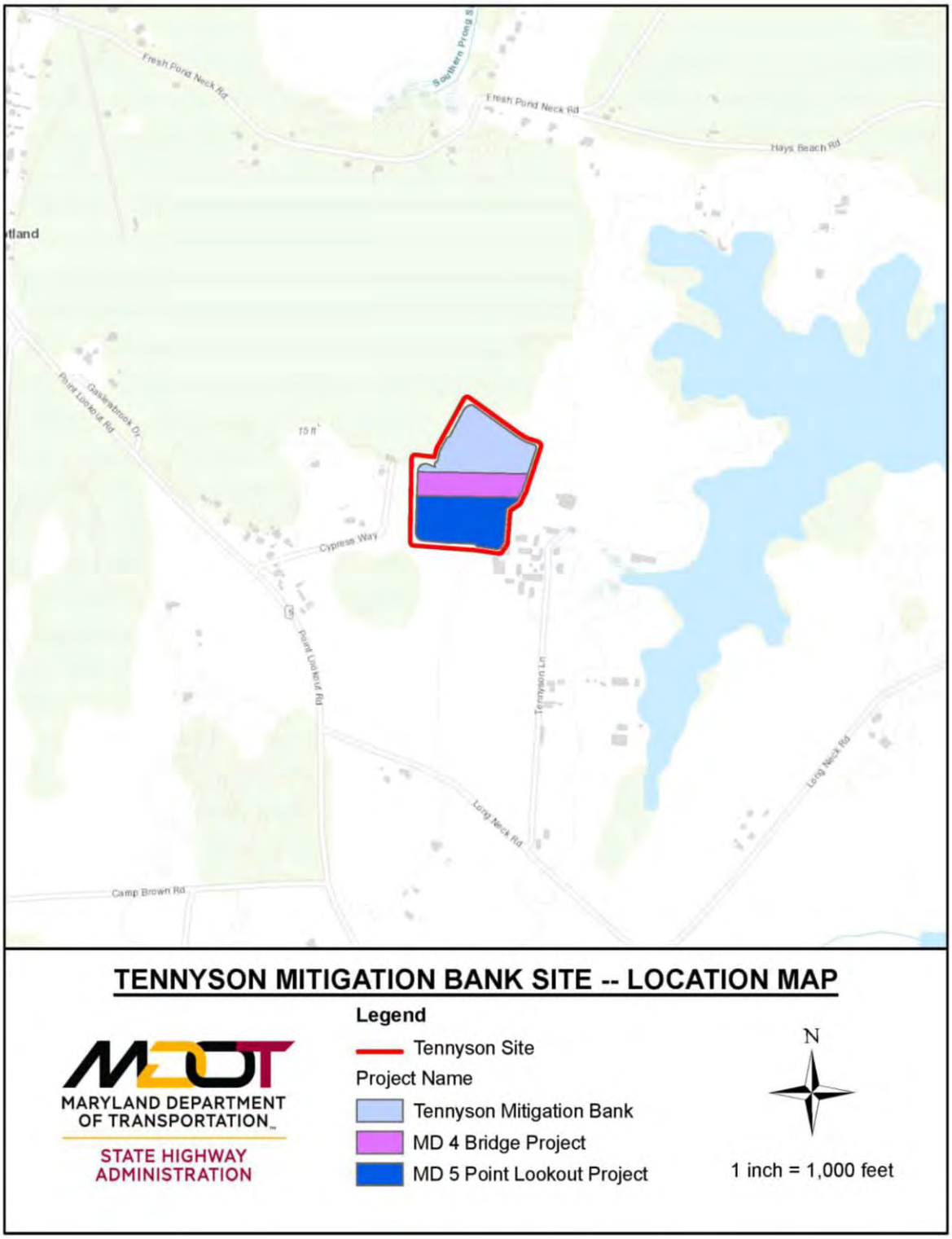


Figure 2 - Tennyson Site Location Map

d) Baseline Information

The Tennyson Mitigation Bank includes non-tidal wetland restoration and enhancement within the Site, located north of the intersection of Long Neck Road and Tennyson Lane in Scotland, Maryland (Figure 2). The Tennyson Mitigation Bank is located within the Severn River federal HUC 8-digit watershed (02060004) as well as the Patuxent River Lower MDE 8-digit watershed (02131101). Non-tidal wetland restoration is proposed on the property adjacent to an existing NWI-mapped palustrine forested wetland (PFO). This portion of the property is currently a fallow field as part of enrollment in the Conservation Reserve Enhancement Program (CREP) from 2003 to 2017. Dominant vegetation includes broom-sedge (*Andropogon virginicus*), switchgrass (*Panicum virgatum*), golden crown grass (*Paspalum dilatatum*), Indian hemp (*Apocynum cannabinum*), and lamp rush (*Juncus effusus*).

Existing Wetland

A wetland delineation was conducted within the Site on July 10 and 12, 2017 and a supplemental wetland delineation was conducted on August 31, 2017. As a result of the field investigations and regulatory agency review, one wetland (W1) was identified within the Tennyson Mitigation Bank. Wetland W1 occurs along the perimeter of the Tennyson Mitigation Bank and consist of a series of narrow palustrine wetland ditches and swales (Appendix A: Tennyson Wetland Delineation Report). Approximately 0.29 acres of Wetland W1 are located within the proposed Tennyson Mitigation Bank.

Hydrology

On average, the groundwater table was more than 3 feet below the surface during the summer as observed from soil pits in July 2017. To verify this observation, seven monitoring wells were installed throughout the Site to obtain measurements of the existing groundwater depths. Data collection for wells 2-6 began on December 14, 2017, and the data for wells 7 and 8 began on January 27, 2018. These data were collected continuously at six-hour intervals through April 2019. There was an error with the data logger downloads, resulting in a loss of data from April 4, 2018 to May 5, 2018. Well data are presented through May 2, 2019. Well 5 is within an existing wetland at the Site and served as a reference wetland to assist with the design hydrology of the mitigation site. Wells 3 and 4 are a set of nested piezometers with Well 4 being installed above the clay soil horizon. Groundwater data collected between December 2017 and May 2019 supports the hypothesis that the site is driven by groundwater and not a perched water table. In addition, the data indicate a rapid response in the groundwater level to precipitation events. See Appendix C for existing well data.

Soils

In addition to the evaluating the hydrology, the evaluation of the Site included an analysis of existing soils. Soil borings were collected at three locations (SB-1, SB-2, and SB-3) within the Tennyson Mitigation Bank to evaluate the textures of the soil profile and identify depth of hydric soil indicators within the soil profile. Soil samples were collected at varying depth intervals from each boring location and submitted for analysis (Appendix D: Tennyson Geotechnical Data). Soil samples were tested for percent organic matter, mechanical analysis (% sand, silt, and clay), pH, and major nutrients (P, N, K). Topsoil will be salvaged and placed following grading to the subgrade elevation, and while there appears to be sufficient organic matter in the topsoil, compost will be placed on the subgrade to ensure organic matter is present for hydric soil development throughout the top 12 inches of soil. In addition, the Soil Survey of St Mary's County shows the Site is primarily in the Othello Soil Series of hydrologic soil groups C/D (See Figure 3).

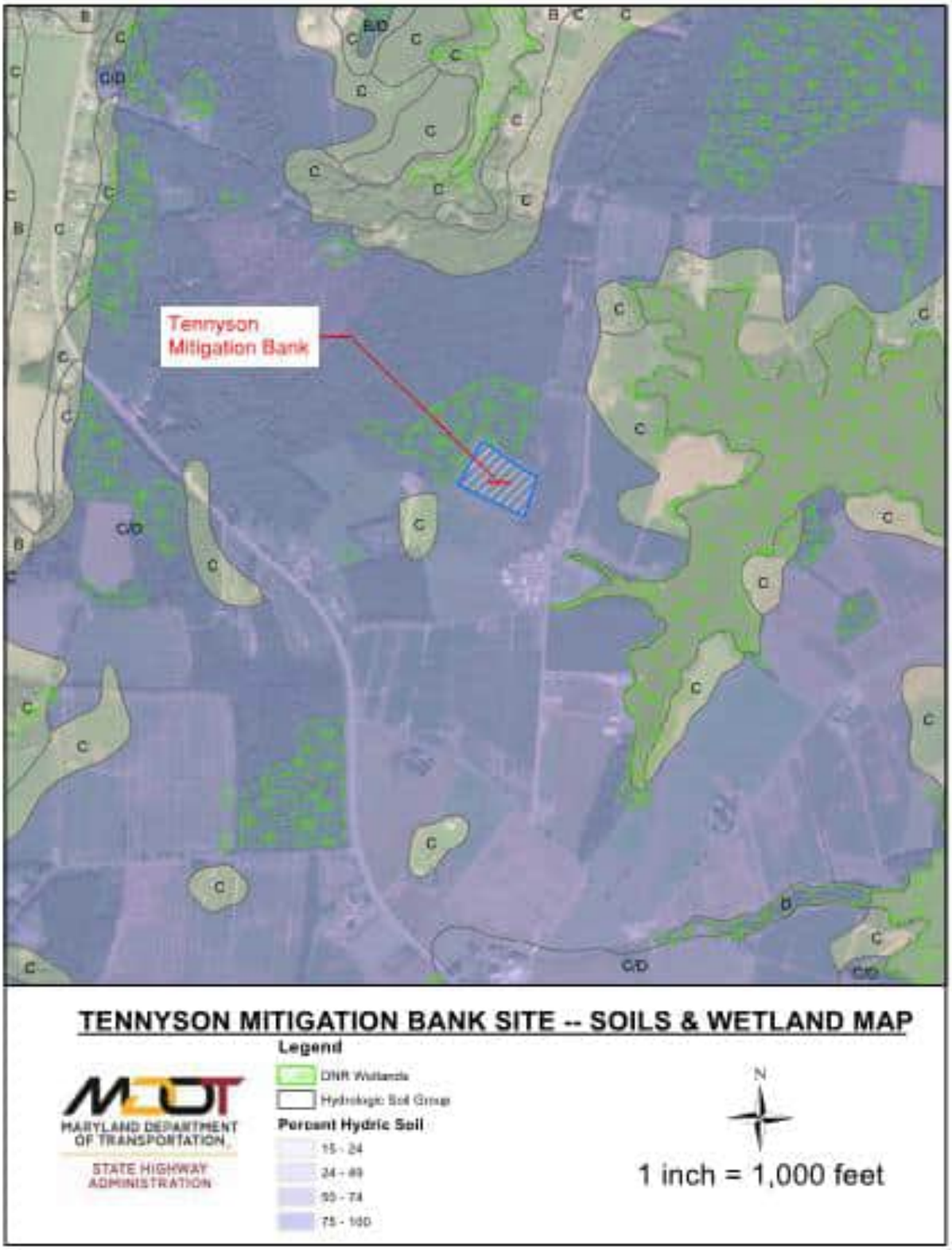


Figure 3 - Tennyson Site with DNR Wetlands and NRCS Soils

Landscape Connectivity

The biological function of the Tennyson Mitigation Bank's landscape connectivity has been limited by its past agricultural land use. The Tennyson Mitigation Bank will provide a permanently protected wetland complex to enhance the existing landscape connectivity.

- The site is located directly adjacent to FIDS habitat according to Maryland Environmental Resource & Land Information Network (MERLIN) as of June 2019 (See Figure 4). FIDS require a large forest area to maintain viable populations. FIDS are an integral part of Maryland's landscape and natural heritage. They depend on large, forested tracts (MERLIN, 2019).

Figure 4 - Tennyson Site with Existing Forest Interior Dwelling Species Habitat Areas

Amphibian Habitat & Microtopography

The Tennyson Mitigation Bank has the potential to improve the amphibian community through the creation of pit and mound microtopography that will create diverse open water habitats for egg laying and larvae development. The mix of wet terrestrial and aquatic habitats will provide shelter from excessive heat, dryness and predators, and support foraging areas for amphibians. The microtopography will be implemented throughout the restoration area, consisting of approximately 30% pits and 20% mounds to provide variability at multiple scales. The forested wetland on the northwest edge of the project area may provide a source population for amphibian species that could utilize the created habitat features.

e) Determination of Credits

As per provisions proposed within the SHA-UMBI, credits for the Tennyson Mitigation Bank will be determined by area (acres) and wetland habitat type (PFO, PSS, PEM, etc.). Credits are proposed at a 1:1 ratio (1 acre of required mitigation: 1 acre of credit) for wetland restoration and a 2:1 ratio for wetland enhancement. Wetland enhancement at the site will result from the overall conversion of land that for many years was managed for row crops and/or livestock grazing, and that most recently lay fallow, to a permanently protected wetland condition. This conversion to wetland will include the removal of invasive species and the planting of native woody wetland species. Additionally, the existing wetland ditches will be connected to a larger wetland complex. In addition to wetland restoration and enhancement, the site will support wetland buffer enhancement (15:1) and wetland buffer preservation (20:1). Most of the wetland buffer will be preservation as shown in Figure 5. These areas will not be planted with woody vegetation to support a permanent herbaceous access road around a portion of the perimeter of the wetland to allow future site maintenance as needed. Areas designated as wetland buffer enhancement occur where the new buffer overlaps wetland restoration, and thus, will be planted with woody vegetation. In total, the Tennyson Mitigation Bank proposes 4.26 acres of potential bank credit. The cumulative total area of permitted wetland impacts allowed to use credits from the mitigation bank shall not exceed the total area of wetlands and buffer credit at this site. Table 2 summarizes proposed credits at the Site and Figure 5 shows the location of each mitigation credit type.

MDOT SHA proposes that available credits can be withdrawn for future transportation projects requiring compensatory mitigation within the defined service areas.

Table 2 - Summary of Tennyson Mitigation Bank Proposed Credits

Tennyson Mitigation Bank Proposed Mitigation Type	**Habitat Type**		**Total**
	PFO	**PEM**	
Wetland Restoration (AC)	4.07	0.00	4.07 (177,243 sf)
Wetland Enhancement (AC)	0.29	0.00	0.29 (12,462 sf)
Wetland Buffer Enhancement (AC)	0.50	0.00	0.50 (21,960 sf)
Wetland Buffer Preservation (AC)	0.00	0.35	0.35 (15,240 sf)
Total (AC)	**4.86**	**0.35**	**5.21 (226,905 sf)**
Tennyson Mitigation Bank Proposed Credits	**Habitat Type**		**Total**
	PFO	PEM	
Wetland Restoration @ 1:1 (AC)	4.07	0.00	4.07 (177,243 sf)
Wetland Enhancement @ 2:1 (AC)	0.14	0.00	0.14 (6,231 sf)
Wetland Buffer Enhancement @ 15:1 (AC)	0.03	0.00	0.03 (1,464 sf)
Wetland Buffer Preservation @ 20:1 (AC)	0.00	0.02	0.02 (762 sf)
Total Credits	**4.24**	**0.02**	**4.26 (185,700 sf)**

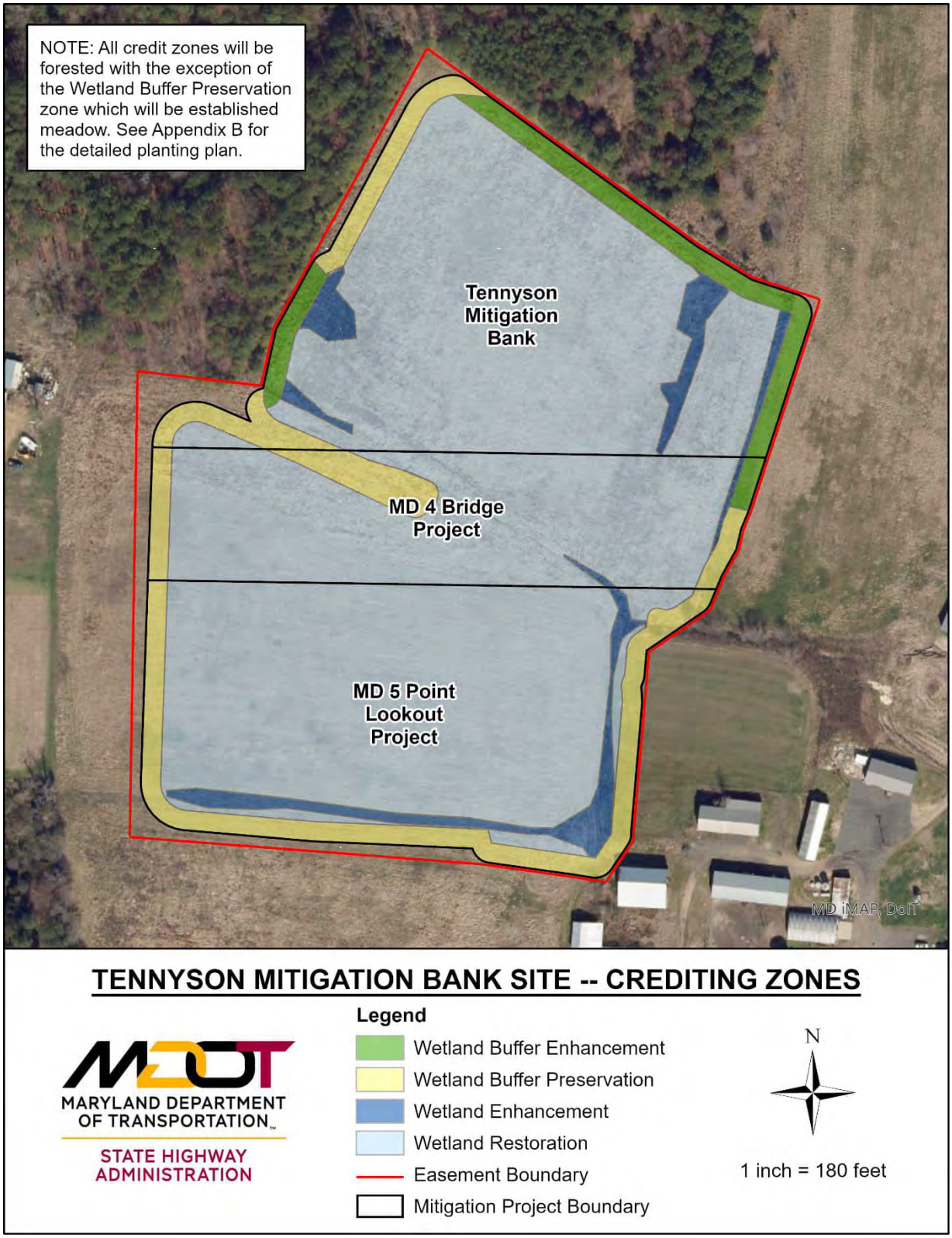


Figure 5 - Tennyson Site Crediting Zones

f) Mitigation Work Plan

The Final Construction Plans for Tennyson Mitigation Bank are included in Appendix B: Tennyson Wetland Mitigation Design Site Plans. The design for the Tennyson Mitigation Bank includes restoration of 4.07 acres of PFO and the enhancement of 0.29 acres from PEM to PFO following construction. The wetland enhancement is proposed where existing palustrine emergent wetlands within the mitigation area will be planted with woody species. In addition, the wetlands will be regraded to connect to the restored wetlands. The field will be graded to create seasonal wetland hydrology at slightly variable elevations to support palustrine forested wetlands that meet the performance criteria. Spring hydrology is anticipated with a significant draw down to support forest vitality in the summer. The groundwater is anticipated to be both seasonal and responsive to precipitation. Three wells have been installed within the Tennyson Mitigation Bank (Appendix C). A nested piezometer was installed to verify that the water table is not perched. In proposed conditions, the ground surface will be approximately 1-foot lower than existing conditions. A pit and mound microtopography will be implemented throughout the restoration area, consisting of approximately 30% pits and 20% mounds to provide variability at multiple scales. The remaining 50% of area will be transitional with less than 20% at the proposed grade. An outlet weir structure at an elevation of 8.5 feet is proposed within the wetland ditch at the southeastern corner of the mitigation area to control surface hydrology on site. Existing topsoil will be salvaged, and the site will be excavated to the required depth for placement of organic compost and six inches of the salvaged topsoil to meet the proposed grade. Additionally, linear clay blocks will be used along the site boundary to reduce seepage through the proposed grades around the outfall. Trees and woody species will be planted throughout the site to meet performance standards, and native herbaceous seed mix will be utilized to provide coverage in the understory. Woody debris piles will be placed throughout the site. The woody debris will provide carbon and additional habitat within the Tennyson Mitigation Bank.

Functions and values associated with the proposed restored and enhanced wetlands include groundwater recharge/ discharge, nutrient removal/ retention/ transformation, production export, wildlife habitat, flood flow alteration, and visual quality/aesthetics, which would effectively replace the functions and values of wetlands impacted within the service area.

g) Maintenance Work Plan

The Maintenance Work Plan will require annual monitoring to observe conditions and ensure the continued viability of the resource once initial construction is complete. Observations and maintenance will include but are not limited to:

- Condition of Site boundary and maintenance of boundary demarcation and signage
- Condition of Site vegetation, survival rates, and management of invasive species
- Woody vegetation survival and tree density
- Construction of outfall

Following the vegetation 2-year care and replacement period, the woody vegetation survival and tree density will be evaluated. If survival rates appear to be significantly impacted due to animal browse or antler rubbing, exterior fencing of the site will be considered and coordinated with the IRT.

h) Performance Standards

The Tennyson Mitigation Bank requires no special deviation from the February 1, 2022 revision to the wetland performance standards as set forth within the *Ecological Performance Standards and Monitoring Protocol for Nontidal Wetland Mitigation Banks and In-lieu Fee Sites in Maryland*. In accordance with

those Standards, the Site shall conform to those performance standards by the end of the monitoring period.

i) Monitoring Requirements

Monitoring will proceed for 10 years as required by the MDOT SHA-UMBI. The site will defer to the Maintenance Work Plan until all credits have been used and the Bank is closed. At such time of Bank closure, the site will be subject to the provisions of the Long-Term Management and Maintenance Plan (Appendix G: Tennyson Long-Term Management Plan).

j) Long-Term Management and Maintenance Plan

The Tennyson Mitigation Bank requires no special deviation from the Long-Term Management and Maintenance Plan set forth within the MDOT SHA-UMBI. (See Appendix G: Tennyson Long-Term Management Plan).

k) Adaptive Management Plan

Adaptive management will be utilized as a means of addressing unforeseen changes in site conditions, which could threaten the success of the project. During the construction phase of the project, the use of an onsite Designated Specialist will allow for routine inspection of the site and minor modification to the design or construction method. The Designated Specialist will also document site conditions that may be problematic and raise the concern to the MDOT SHA Project Construction Engineer, thus triggering a process for assessment of the condition. Depending on the severity of the condition, the Interagency Review Team (IRT) will be notified of the problem and proposed solutions will be presented before moving forward with any modification to the design.

Upon completion of construction, annual monitoring will note any problems that threaten the sites viability and recommendations will be made to address them. Again, the IRT will be made aware of the issues and solutions will be addressed through consultation between MDOT SHA, site designer, and the IRT.

l) Financial Assurances

As set forth in the MDOT SHA-UMBI and the Financial Assurance letter provided therein, MDOT SHA is financially committed to its mitigation program and the management, monitoring, and maintenance required for maintaining viable, functioning wetlands. MDOT SHA will provide the necessary funds to carry out the Tennyson Wetland Mitigation Design Site Plans, Maintenance Work Plan and subsequent Long-Term Management and Maintenance Plan for the Tennyson Mitigation Bank. These funds include anticipated site management needs, such as annual site visits, invasive species treatments, site boundary maintenance, and consulting and contractual services associated with the site assessments and site management. Should any substantial maintenance issue develop, or a catastrophic event occur, MDOT SHA will allocate funds from the Transportation Trust Fund to perform the maintenance/remediation activity. The cost/budget estimate will be provided separately.

m) Service Area

The Tennyson Mitigation Bank is located within the federal 8-digit Severn HUC (02060004) and within the MDE 8-digit Patuxent River lower watershed (MDE 02131101). The Severn (02060004) HUC-8 will be considered as the primary service area, and the Coastal Plain portions of the Patuxent (02060006) and Gunpowder-Patapsco (02060003) HUC-8 watersheds will be considered as the secondary service areas (See Figure 6). Major Maryland drainages within the Severn HUC include: Magothy River, Severn River, South River, Rhode River, West River, Rockhold Creek, Tracy's Creek, Parker Creek, Carrs

Creek, Broadway Creek, Fishing Creek, Brownies Creek, Plum Point Creek, Parkers Creek, Grover Creek, Thomas Branch, Grays Creek, St. Jerome Creek, and Long Neck Creek.

As noted above, the proposed Secondary Service Areas are the portions of the Patuxent (02-06-00-06) and the Gunpowder-Patapsco (02-06-00-03) within the Atlantic Coastal Plan (Figure 6). Utilization of the adjacent 8-digit HUC watersheds within the Patuxent and Gunpowder-Patapsco is in accordance with the SHA-UMBI. The impacts within the secondary HUCs can be reasonably mitigated at the Bank to provide functional replacement and water quality benefits within the same river basin. Use of the secondary service area will only be allowed if there are no banks available within a primary service area of the impacts. Higher mitigation ratios will be required for impacts in the secondary service area. Before a project within the secondary service area can utilize this bank, the Permittee will need to provide justification that impacts will be replaced by this bank and receive approval from the IRT.

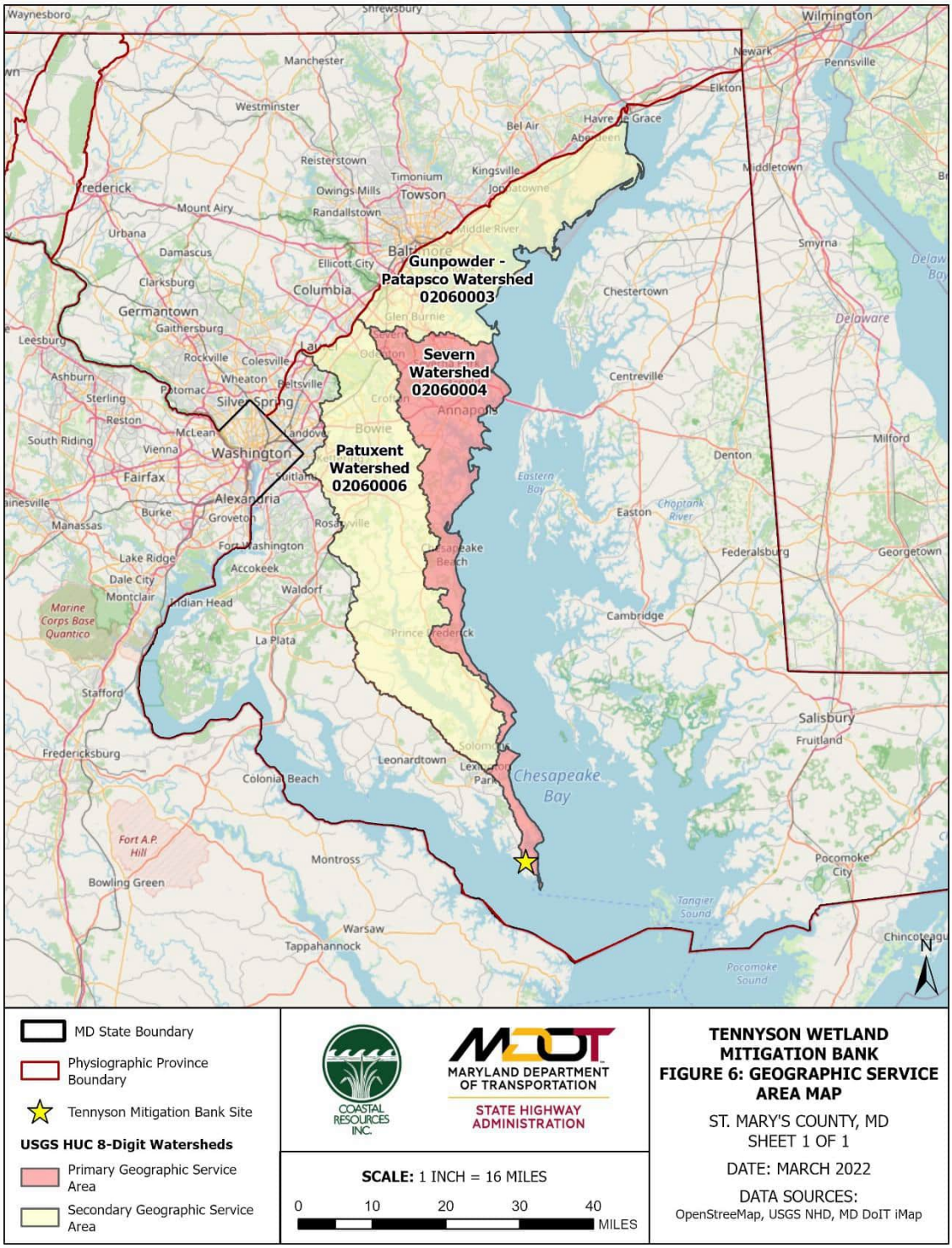


Figure 6 - Tennyson Mitigation Bank Proposed Geographic Service Area

n) Credit Release Schedule

The proposed credit release schedule is based on the Nontidal Wetland Credit Release Schedule in the approved MDOT SHA-UMBI. The wetland restoration/enhancement credits will be released over a ten-year schedule as outlined in Table 3. Per the MDOT SHA-UMBI "if the Mitigation Bank site meets the final year's Performance Standards for two consecutive years, the sponsor may propose that remaining credits be released prior to the final year of monitoring." Monitoring for all areas will begin after construction is complete.

Table 3 - Tennyson Credit Release Schedule

Stage	Tennyson Mitigation Bank Proposed Credit Release
At MBI and LTM approval and recordation of C&R	15%
Completed construction and As-Builts	15%
Year 2 Performance Standards met	20%
Year 3 Performance Standards met	10%
Year 5 Performance Standards met	15%
Year 7 Performance Standards met	10%
Year 10 Performance Standards met	15%
Total	**100%**

APPENDIX B

TENNYSON WETLAND MITIGATION DESIGN SITE PLANS

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

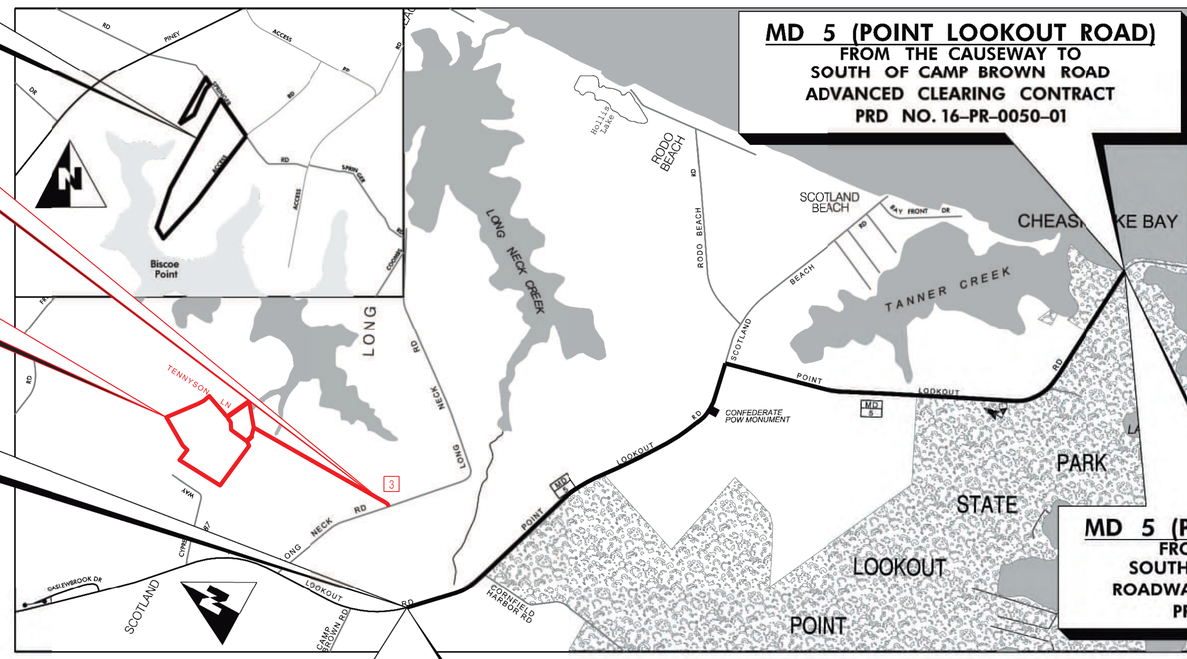
S.H.A. CONTRACT NO. – SM7745171
FEDERAL AID PROJECT NO. – AC–STBG–1225(12)N
MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH OF CAMP BROWN ROAD

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO
SOUTH OF CAMP BROWN ROAD
PINEY POINT MITIGATION SITE
PRD NO. 16–PR–0050–02

3 **MD 5 (POINT LOOKOUT ROAD)**
FROM THE CAUSEWAY TO
SOUTH OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION
SITE CONTRACT
PRD NO. 16–PR–0050–03

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO
SOUTH OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION
SITE CONTRACT
PRD NO. 16–PR–0050–03

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO
SOUTH OF CAMP BROWN ROAD
ADVANCED CLEARING CONTRACT
PRD NO. 16–PR–0050–01



MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO
SOUTH OF CAMP BROWN ROAD
ADVANCED CLEARING CONTRACT
PRD NO. 16–PR–0050–01

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO
SOUTH OF CAMP BROWN ROAD
ROADWAY IMPROVEMENT CONTRACT
PRD NO. 16–PR–0050–02

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO
SOUTH OF CAMP BROWN ROAD
ROADWAY IMPROVEMENT CONTRACT
PRD NO. 16–PR–0050–02

ST. MARY'S COUNTY

SCALE: 1" = 2000'
2000 0 2000 4000 feet

HORIZONTAL DATUM	NAD 83 /91
VERTICAL DATUM	NAVD 88

GEOMETRIC DESIGN CRITERIA
THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE 2011 PUBLICATION OF AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS."

STANDARD SPECIFICATIONS BOOK, BOOK OF STANDARDS AND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
ALL WORK ON THIS PROJECT SHALL CONFORM TO: THE LATEST APPROVED MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION (MDOT SHA) **"STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS"** REVISIONS THEREOF OR ADDITIONS THERETO, AS INDICATED IN THE PROJECT DESCRIPTION OF THE INVITATION FOR BIDS BOOK; THE SPECIAL PROVISIONS INCLUDED IN THE INVITATION FOR BIDS BOOK; THE ADMINISTRATION'S **"BOOK OF STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES"** AND THE LATEST ADOPTED MUTCD.

RIGHT OF WAY
RIGHT OF WAY AND EASEMENT LINES SHOWN ON THESE PLANS ARE FOR ASSISTANCE IN INTERPRETING THE PLANS. THEY ARE NOT OFFICIAL. FOR OFFICIAL FEE RIGHT OF WAY AND EASEMENT INFORMATION, SEE APPROPRIATE RIGHT OF WAY PLATS.

UTILITIES
THE LOCATION OF UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION AND GUIDANCE ONLY. NO GUARANTEE IS MADE OF THE ACCURACY OF SAID LOCATIONS.

ADA COMPLIANCE
THE DESIGN OF THIS PROJECT HAS INCORPORATED FACILITIES TO ACCOMODATE PERSONS WITH DISABILITIES IN COMPLIANCE WITH STATE AND FEDERAL REQUIREMENTS.

ENVIRONMENTAL INFORMATION
ALL STORMWATER MANAGEMENT FACILITIES CONSTRUCTED FOR THIS CONTRACT SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE MDOT SHA BEST MANAGEMENT PRACTICES (BMP) INSPECTION AND REMEDIATION PROGRAM.

STANDARD STABILIZATION NOTE:
FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1), AND SEVEN DAYS (7) AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

OWNERS / DEVELOPERS CERTIFICATION:
I / WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON–SITE EVALUATION BY MDE COMPLIANCE INSPECTORS.

EXISTING STRUCTURES PLANS
FOR THE CONVENIENCE AND INFORMATION OF BIDDERS, PRINTS OF PLANS OF EXISTING PERTINENT STRUCTURE(S) ARE INCLUDED WITH THIS CONTRACT. NO RESPONSIBILITY FOR THEIR ACCURACY OR COMPLETENESS IS ASSUMED BY THE MDOT SHA. DIMENSIONS, DETAILS, ETC., AS SHOWN THEREON MAY NOT BE AS BUILT.

3 **WBCM**
WHITNEY BAILEY COX & MAGNANI, LLC
SHEET NOS. AND OTHER CLARIFICATIONS
222 – 251
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
MD LICENSE NO. 25402 EXPIRATION DATE: 7/17/2024

ENDESCO, INC.
SHEET NOS. AND OTHER CLARIFICATIONS
214
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
MD LICENSE NO. 44628 EXPIRATION DATE: ~~12/12/2021~~ 2023 3

AMT
A. MORTON THOMAS AND ASSOCIATES, INC.
SHEET NOS. AND OTHER CLARIFICATIONS
192A 3
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
MD LICENSE NO. 3381 EXPIRATION DATE: ~~10/22/2020~~ 2022 3

STREETSCAPES LANDSCAPE ARCHITECTURE INC.
SHEET NOS. AND OTHER CLARIFICATIONS
174 – 191
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
MD LICENSE NO. 961 EXPIRATION DATE: ~~4/19/2022~~ 2024 3

DESIGN DESIGNATION

ROADWAY	MD 5		MD 5		MD 5	
ROADWAY LENGTH (MILEPOINTS)	0.15 MILES (MP 0.00 - 0.15)		0.52 MILES (MP 0.15 - 0.67)		1.57 MILES (MP 0.67 - 2.24)	
CONTROL YEARS	2015	2035	2015	2035	2015	2035
AVERAGE DAILY TRAFFIC (A.D.T.)	3650	4275	3650	4275	3650	4275
DESIGN HOURLY VOLUME (D.H.V.)	9%	9%	9%	9%	9%	9%
DIRECTIONAL DISTRIBUTION	66%	66%	66%	66%	66%	66%
% TRUCKS (A.D.T.)	4%	4%	4%	4%	4%	4%
% TRUCKS (D.H.V.)	3%	3%	3%	3%	3%	3%
FUNCTIONAL CLASSIFICATION	LOCAL		MINOR COLLECTOR		MAJOR COLLECTOR	
CONTROL OF ACCESS	NONE		NONE		NONE	
INTENSITY OF DEVELOPMENT	RURAL		RURAL		RURAL	
TERRAIN	LEVEL		LEVEL		LEVEL	
DESIGN SPEED (M. P. H.)	20		30		40	
ANTICIPATED POSTED SPEED (M. P. H.)	20		30		40	
MDOT SHA CONTEXT ZONE	E (RURAL)		E (RURAL)		E (RURAL)	

SURVEY BOOK NUMBERS	RIGHT OF WAY PLAT NUMBERS
19014	59612
13743	59613
	59614
	59615
	59616
	59617
	59618
	59619
	59620
	59621
	59622
	59623
	60562
	60563
	60564
	60931

REVISIONS
NOTE: SEE SHEET NO. 2 FOR LIST OF REVISED SHEET NUMBERS
2 GMP NO. 2 08/07/2020
1 GREENLINE NO.1 09/08/2021
3 GMP NO. 3 09/30/2022

STORMWATER AND SEDIMENT CONTROL FINAL APPROVAL
APPROVED — DATE 2/6/2017
CHIEF, PLAN REVIEW DIVISION
PRD NO: 16-PR-0050-02 EXPIRATION DATE: 2/6/2022

MODIFICATIONS
MOD 4 - APP'D 11/13/2020
16-PR-0050-03: FINAL APP'L 7/6/2022
16-PR-0050-03: MOD 1 8/30/2022

APPROVED — DATE 04/27/2020
DIVISION CHIEF, HIGHWAY DESIGN DIVISION

APPROVED — DATE 5/29/2020
DIRECTOR, OFFICE OF HIGHWAY DEVELOPMENT

APPROVED — DATE 29MAY2020
DEPUTY ADMINISTRATOR / CHIEF ENGINEER
FOR PLANNING, ENGINEERING, REAL ESTATE AND ENVIRONMENT

5/21/2020

CONTRACT NO.: SM7745171

DRILL HOLES
DRILL HOLES
DRILL HOLES
A
BY: RMath –

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[1] GREENLINE NO.1
ADDED SHEETS:
192A LD-19A

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GENERAL		
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[1] 2	INDX-01	INDEX OF SHEETS
ADVANCED CLEARING CONTRACT		
3	LM-01	LOCATION MAP
4	INDEX-02	INDEX OF SHEETS
5	AB-01	NOTES AND ABBREVIATIONS
6-10	GS-01 - GS-05	GEOMETRY
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29	ES-01	EROSION AND SEDIMENT CONTROL GENERAL NOTES
ROADWAY IMPROVMENT CONTRACT		
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80-86	MT-09 - MT-15	MAINTENANCE OF TRAFFIC PHASE 3
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108-112	DP-01 - DP-05	DRAINAGE PROFILES
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153-170	ES-37 - ES-54	EROSION & SEDIMENT CONTROL: PHASE 3
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194	LD-21	PINEY POINT PLANT SCHEDULE & DETAILS
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225	DE-01	WETLAND MITIGATION SECTION & DETAILS
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243	ED-01	EROSION & SEDIMENT CONTROL DETAILS
244-251	ES-01 - ES-08	EROSION & SEDIMENT CONTROL PLANS
252-259	LD-01 - LD-08	LANDSCAPE PLANS
260	LD-09	LANDSCAPE SCHEDULES

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

HIGHWAY DESIGN DIVISION
MD 5 (POINT LOOKOUT RD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD

REVISIONS
[2] GMP NO. 2 08/07/2020
[1] GREENLINE NO.1 09/08/2021
[3] GMP NO. 3 09/30/2022

INDEX OF SHEETS

SCALE N/A ADVERTISED DATE 03/28/2017 CONTRACT NO. SM7745171A

DESIGNED BY HDD
DRAWN BY HDD
CHECKED BY HDD
MDE/PRD SEE TITLE SHEET

COUNTY ST. MARY'S
LOGMILE

DRAWING NO. INDX – 01 OF 04 SHEET NO. 2 OF 260

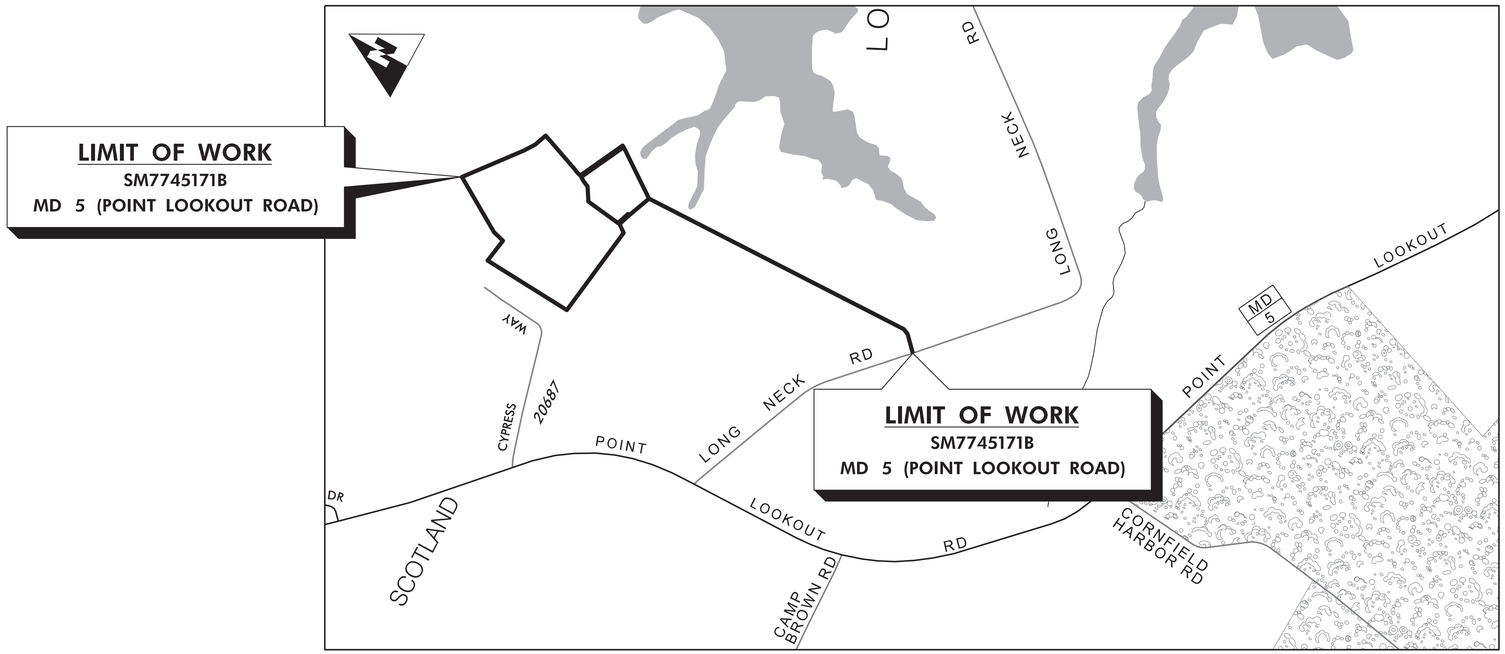
BY: RMathews2 – Highway Design Division

PLOTTED: 09/01/2021

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

S.H.A. CONTRACT NO. – SM7745171B
FEDERAL AID PROJECT NO. – AC–STBG–1225(12)N
MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE CONTRACT



ST. MARY'S COUNTY

1000' 0 1000' 2000'
SCALE: 1" = 1000'

HORIZONTAL DATUM	NAD 83 /91
VERTICAL DATUM	NAVD 88

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THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE 2011 PUBLICATION OF AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS."

STANDARD SPECIFICATIONS BOOK, BOOK OF STANDARDS AND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
ALL WORK ON THIS PROJECT SHALL CONFORM TO: THE LATEST APPROVED MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION (MDOT SHA) **"STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS"** REVISIONS THEREOF OR ADDITIONS THERETO, AS INDICATED IN THE PROJECT DESCRIPTION OF THE INVITATION FOR BIDS BOOK; THE SPECIAL PROVISIONS INCLUDED IN THE INVITATION FOR BIDS BOOK; THE ADMINISTRATION'S **"BOOK OF STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES"** AND THE LATEST ADOPTED MUTCD.

RIGHT OF WAY
RIGHT OF WAY AND EASEMENT LINES SHOWN ON THESE PLANS ARE FOR ASSISTANCE IN INTERPRETING THE PLANS. THEY ARE NOT OFFICIAL. FOR OFFICIAL FEE RIGHT OF WAY AND EASEMENT INFORMATION, SEE APPROPRIATE RIGHT OF WAY PLATS.

UTILITIES
THE LOCATION OF UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION AND GUIDANCE ONLY. NO GUARANTEE IS MADE OF THE ACCURACY OF SAID LOCATIONS.

ADA COMPLIANCE
THE DESIGN OF THIS PROJECT HAS INCORPORATED FACILITIES TO ACCOMODATE PERSONS WITH DISABILITIES IN COMPLIANCE WITH STATE AND FEDERAL REQUIREMENTS.

ENVIRONMENTAL INFORMATION
ALL STORMWATER MANAGEMENT FACILITIES CONSTRUCTED FOR THIS CONTRACT SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE MDOT SHA BEST MANAGEMENT PRACTICES (BMP) INSPECTION AND REMEDIATION PROGRAM.

STANDARD STABILIZATION NOTE:
FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1), AND SEVEN DAYS (7) AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

OWNERS / DEVELOPERS CERTIFICATION:
I / WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON–SITE EVALUATION BY MDE COMPLIANCE INSPECTORS.

EXISTING STRUCTURES PLANS
FOR THE CONVENIENCE AND INFORMATION OF BIDDERS, PRINTS OF PLANS OF EXISTING PERTINENT STRUCTURE(S) ARE INCLUDED WITH THIS CONTRACT. NO RESPONSIBILITY FOR THEIR ACCURACY OR COMPLETENESS IS ASSUMED BY THE MDOT SHA. DIMENSIONS, DETAILS, ETC., AS SHOWN THEREON MAY NOT BE AS BUILT.

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SHEET NOS. AND OTHER CLARIFICATIONS

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
MD LICENSE NO. 25402 **EXPIRATION DATE:** 7/7/24

STATE OF MARYLAND
BRIAN SCOTT HALL
NO. 25402
REGISTERED
PROFESSIONAL ENGINEER

REVISIONS
NOTE: SEE SHEET NO. 2 FOR LIST OF REVISED SHEET NUMBERS

3 GMP NO. 3 09/30/2022

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
Mette Flamm 7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

MODIFICATIONS
16-PR-0050-03: MOD 1 8/30/2022

LOCATION MAP

DRAWING NO. LM – 03 OF 03 | SHEET NO. 222 OF 260

P:\2012\12003309\Drawings\pGN-LM00_MD005_GMP3.dgn
6/24/2022

CONTRACT NO.: **SM7745171**

BY: arussell –

DRILL HOLES
DRILL HOLES
DRILL HOLES

INDEX OF SHEETS

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223	INDX–04	INDEX OF SHEETS
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225	DE–01	WETLAND MITIGATION SECTION & DETAILS
226	DE–02	WETLAND MITIGATION DETAILS
227	DE–03	WETLAND MITIGATION DETAILS
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230	WT–01	WETLAND MITIGATION PLAN SHEET
231	WT–02	WETLAND MITIGATION PLAN SHEET
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233	WT–04	WETLAND MITIGATION PLAN SHEET
234	WT–05	WETLAND MITIGATION PLAN SHEET
235	WT–06	WETLAND MITIGATION PLAN SHEET
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259	LD–08	LANDSCAPE PLAN SHEET
260	LD–09	LANDSCAPE SCHEDULES

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

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REVISIONS

3 GMP NO.3 09/30/2022

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

INDEX OF SHEETS

SCALE NTS ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16–PR–0050–03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. INDEX-04 OF 04

SHEET NO. 223 OF 260

BY: arussell–

PLOTTED: 6/21/2022

ABBREVIATIONS

AASHTO	American Association of State Highway Transportation Officials
ADT.	Average Daily Traffic
AHD.	Ahead
APPROX.	Approximate
℄ or B/L	Baseline
BK	Back /Book
BIT.	Bituminous
B.C.	Bituminous Concrete
B.M.	Bench Mark
BOT.	Bottom
C.C.	Center of Curve
CAP	Corrugated Aluminum Pipe
CAPA	Corrugated Aluminum Pipe Arch
CATV	Cable Television
C.B.R.	California Bearing Ratio
℄ or C/L	Centerline
CL.	Class
CLF.	Chainlink Fence
CMP.	Corrugated Metal Pipe
C.O.	Cleanout
COMB.	Combination
CONC.	Concrete
CONSTR.	Construction
COR.	Corner
CORR.	Correction
CPP–S	Corrugated Polyethylene Pipe – Type 'S'
CSP	Corrugated Steel Pipe – Aluminized Type 2
CSPA	Corrugated Steel Pipe Arch – Aluminized Type 2
DC	Degree of Curve
D.H.V.	Design Hourly Volume
D.I.	Drop Inlet
DIA.	Diameter
D.O.	Double Opening
E	East
E	Electric
E	External Distance
EA	Each
EB	Eastbound
ELEV	Elevation
ES	End Section
EX or EXIST	Existing
FT	Feet
F or FL	Flowline
F.B.D.	Flat Bottom Ditch
F.H.	Fire Hydrant
FWD.	Forward
G	Gas
G.V.	Gas Valve
H.B.	Handbox
HDPE	High Density Polyetheylene
HDWL.	Headwall
HERCP	Horizontal Ellipitical Reinforced Concrete Pipe
HP.	High Point
IN	Inch
I.S.T.	Inlet Sediment Trap
INV.	Invert
J.B.	Junction Box
K	K Inlet
KSB.	Keystone Boulder
L	Length
LF	Linear Feet
L.L.	Liquid Limit
LP	Low Point
L.P.	Light Pole
LT.	Left
MAC.	Macadam
M.C.	Moisture Content
MAX.	Maximum
M.D.D.	Maximum Dry Content
MOD.	Modified
MIN.	Minimum
N	North
NB	Northbound
NE	Northeast
N.P.	Non–Plastic
O.C.	On Center
OHE	Overhead Electric
O.M.	Optimum Moisture
PAV'T.	Pavement
PC	Point of Curvature
PCC	Point of Compound Curvature
P/C	Point of Crown
P/GE	Profile Grade Elevation
P.G.E.	Profile Ground Elevation
P.G.L.	Profile Grade Line
P/GL	Profile Ground Line
P/R	Point of Rotation
P.I.	Plasticity Index
PI	Point of Intersection
POC	Point On Curve
POT	Point On Tangent
PPWP	Polyvinyl Chloride Profile Wall Pipe
PROP	Proposed
PRC	Point of Reverse Curve
PT	Point
PT	Point of Tangency
PVC	Point of Vertical Curve
PVC	Polyvinyl Chloride
PVI	Point of Vertical Intersection
PVRC	Point of Vertical Reverse Curve
PVT	Point of Vertical Tangency
R	Radius
R.F.	Rock Fragments
RT	Right
RW or R/W	Right of Way
RCP	Reinforced Concrete Pipe
RCPP	Reinforced Concrete Pressure Pipe
R.Q.D.	Rock Quality Designation
R.M.	Rootmat
S	South
SAN.	Sanitary Sewer
SB or S/B	Southbound
S.D.	Storm Drain
S.D.D.	Surface Drain Ditch
S/E	Super Elevation
SF	Silt Fence
SF	Square Feet
SHT.	Sheet
SPP	Structural Steel Plate Pipe
SPPA	Structural Steel Plate Pipe Arch
S.P.T.	Standard Penetration Testing
SRP	Steel Spiral Rib Pipe – Aluminized Type 2
SRPA	Steel Spiral Rib Pipe Arch – Aluminized Type 2
SSD	Stopping Sight Distance
SSF	Super Silt Fence
STD.	Standard
STA.	Station
SO.	Single Opening
SY	Square Yards
SWM	Stormwater Management
T	Tangent
T	Telephone
T.C.	Top of Cover
T.G.	Top of Grate
T or TL	Traverse Line
T.M.	Top of Manhole
TRAV.	Traverse
TS	Temporary Swale
T.S.	Top of Slab
T.S.	Topsoil
TYP.	Typical
U.D.	Under Drain
U.G.	Underground
U.P.	Utility Pole
USDA	United States Department of Agriculture
VCL	Vertical Clearance
V.C.L.	Vertical Curve Length
W	Water
W	West
WB	Westbound
WB	Wetland Buffer
W.M.	Water Meter
W.S.	Wrapped Steel
WUS	Waters of the United States
W.V.	Water Valve

CONVENTIONAL SIGNS

PROPOSED MEDIAN BARRIER
ELECTRICAL HAND BOX – SIGNALS (H.B.)
FLOW LINE
STATE, COUNTY OR CITY LINES
PROPOSED TRAFFIC BARRIER
EXISTING TRAFFIC BARRIER
PROPOSED FENCE LINE
EXISTING FENCE LINE
RIGHT OF WAY LINE
EXISTING ROADWAY (31 50 32)
RAILROAD
BASE LINE OR SURVEY LINE
FIRE HYDRANT (F.H.)
HISTORIC BOUNDARY (H)
WETLAND BOUNDARY

PROPOSED PIPE / CULVERT
EXISTING PIPE / CULVERT
EXISTING DROP INLET
UTILITY POLE
WETLAND
WETLAND BUFFER (B)
WATERS OF THE U.S. (WUS)
HEDGE /TREE LINE
BUSH /TREE
CONIFEROUS TREE
GROUND ELEVATION (DATUM LINE 173.6)
GRADE ELEVATION (DATUM LINE 210.22)
TRUCK CROSSING (SYMBOL) (W11–10(1))

MOT GENERAL NOTES

1. ALL STANDARD REGULATORY AND WARNING SIGNS USED FOR MAINTENANCE OF TRAFFIC SHALL BE IN ACCORDANCE WITH "MD MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD–LATEST EDITION) AND MARYLAND STANDARD SIGN BOOK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROCURE THE LATEST EDITION AND SUPPLEMENTS OF EACH OF THESE PUBLICATIONS FOR USE. ALL REGULATORY AND WARNING SIGNS SHALL BE "STANDARD SIZE", UNLESS OTHERWISE NOTED ON THE TCP OR AS DIRECTED BY THE ENGINEER.
2. ALL TRAFFIC CONTROL DEVICES MUST ADHERE TO THE CURRENT EDITION OF THE MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MD MUTCD), THE CURRENT EDITION OF THE MARYLAND STATE HIGHWAY ADMINISTRATION (MD SHA) BOOK OF STANDARDS FOR HIGHWAY AND INCIDENTAL STRUCTURES, AND THE CURRENT EDITION OF THE MD SHA BOOK OF STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS.
3. NO WORKING MOT IS TO BEGIN UNTIL ALL ADVANCE WARNING SIGNS ARE IN PLACE AND OPERATIONAL. ALL TEMPORARY TRAFFIC CONTROL SIGNS THAT ARE INSTALLED SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF CONSTRUCTION, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. SIGNS SHALL BE MOUNTED ON WOOD POSTS AND SHALL HAVE RETRO REFLECTIVE SHEETING.
4. LONGITUDINAL DISTANCES OF ALL ADVANCED WARNING SIGNS MAY BE ADJUSTED DUE TO INTERSECTING STREETS, DRIVEWAYS, AND/OR FIELD CONDITIONS AS APPROVED BY THE ENGINEER.
5. THE CONTRACTOR SHALL REFER TO SECTION 104.01 OF THE CONTRACT SPECIAL PROVISIONS, FOR WORK HOUR RESTRICTIONS AND TEMPORARY LANE AND SHOULDER CLOSURE SCHEDULE.
6. ACCESS TO DRIVEWAYS AND TENNYSON LANE MUST BE MAINTAINED AT ALL TIMES UNLESS CLOSURES ARE PERMITTED BY THE PROPERTY OWNER. EMERGENCY ACCESS MUST BE MAINTAINED AT ALL TIMES TO ALL DRIVEWAYS AND TENNYSON LANE. ADEQUATE INTERSECTION AND STOPPING SIGHT DISTANCES IN ACCORDANCE WITH AASHTO MUST BE MAINTAINED AT ALL TIMES FOR ALL ACCESS POINTS.
7. WHERE MOT SETUPS ARE PERMITTED DURING PEAK HOURS, THE MOT SETUPS ARE TO REMAIN INSTALLED FOR THE DURATION OF THE CONSTRUCTION PHASE, REGARDLESS OF THE TIME OF DAY.
8. PLACE "TRUCK CROSSING (SYMBOL)" SIGNS (MSHA STD. W11–10(1)) 1,000 FEET BEFORE THE INTERSECTION OF MD 5 (POINT LOOKOUT ROAD) AND LONG NECK ROAD ALONG MD 5 (POINT LOOKOUT ROAD) FOR THE NORTHBOUND LANE AND THE SOUTHBOUND LANE AS DIRECTED AND APPROVED BY THE ENGINEER. THE SIGNS SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF THE CONSTRUCTION OF THE TENNYSON WETLAND MITIGATION SITE. DO NOT USE SUPPLEMENTAL DISTANCE PLAQUES FOR THE "TRUCK CROSSING (SYMBOL)" SIGNS (MSHA STD. W11–10(1)).
9. PLACE "TRUCK CROSSING (SYMBOL)" SIGNS (MSHA STD. W11–10(1)) 800 FEET BEFORE THE INTERSECTION OF LONG NECK ROAD AND TENNYSON LANE ALONG LONG NECK ROAD FOR THE EASTBOUND LANE AND THE WESTBOUND LANE AS DIRECTED AND APPROVED BY THE ENGINEER. THE SIGNS SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF THE CONSTRUCTION OF THE TENNYSON WETLAND MITIGATION SITE. DO NOT USE SUPPLEMENTAL DISTANCE PLAQUES FOR THE "TRUCK CROSSING (SYMBOL)" SIGNS (MSHA STD. W11–10(1)).
10. ALL WORK PERFORMED WITHIN 15 FEET FROM THE EDGE OF EXISTING PAVEMENT OF LONG NECK ROAD USE STANDARD NO. MD 104.02–02 ONLY DURING THE DAYTIME AND ONLY USE "15 MIN. – 12 HOURS OR DAYTIME USE" OPTION.
11. THE SIGNS SHOULD BE PLACED PER LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MD MUTCD), GUIDANCE TO BE APPROPRIATELY FAR IN ADVANCE AND APPROPRIATELY SPACED FROM EXISTING SIGNS.
12. WHEN A SHOULDER CLOSURE IS NECESSARY AND APPROVED BY THE ENGINEER FOR LONG NECK ROAD USE STANDARD NO. MD 104.02–02 ONLY DURING THE DAYTIME AND ONLY USE "15 MIN. – 12 HOURS OR DAYTIME USE" OPTION.
13. WHEN A LANE CLOSURE IS NECESSARY AND APPROVED BY THE ENGINEER FOR LONG NECK ROAD USE STANDARD NO. MD 104.02–10 ONLY DURING THE DAYTIME AND ONLY USE "15 MIN. – 12 HOURS OR DAYTIME USE" OPTION.
14. WHEN A SHOULDER CLOSURE IS NECESSARY AND APPROVED BY THE ENGINEER FOR MD 5 (POINT LOOKOUT ROAD) USE STANDARD NO. MD 104.02–01 ONLY DURING THE DAYTIME AND ONLY USE "15 MIN. – 12 HOURS OR DAYTIME USE" OPTION.
15. WHEN A LANE CLOSURE IS NECESSARY AND APPROVED BY THE ENGINEER FOR MD 5 (POINT LOOKOUT ROAD) USE STANDARD NO. MD 104.02–09 ONLY DURING THE DAYTIME AND ONLY USE "15 MIN. – 12 HOURS OR DAYTIME USE" OPTION.

GENERAL NOTES

1. THE LOCATION OF THE UNDERGROUND AND SURFACE UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION AND GUIDANCE ONLY. NO GUARANTEE IS MADE AS TO THE ACCURACY OF SAID LOCATIONS. CONTRACTOR SHALL CONTACT "MISS UTILITY" AT 1–800–257–7777, 48 HOURS PRIOR TO EXCAVATION FOR MARKING AND LOCATION OF UTILITIES.
2. THE CONTRACTOR SHALL CHECK ALL DIMENSIONS AND ELEVATIONS PRIOR TO CONSTRUCTION. ANY CONFLICTS CONCERNING THE CONSTRUCTION AROUND EXISTING OBSTRUCTIONS PER THESE PLANS SHALL BE RESOLVED BETWEEN THE CONTRACTOR AND THE ENGINEER.
3. THE CONTRACTOR AND OTHERS SHALL PERFORM ALL WORK IN A MANNER THAT WILL ENSURE THE LEAST PRACTICAL OBSTRUCTION TO TRAFFIC, PEDESTRIANS, BUSINESSES, RESIDENTS, AND BE CONSISTENT WITH SAFETY.
4. ALL INVERT ELEVATIONS ARE APPROXIMATE AND MAY BE MODIFIED TO MEET CONDITIONS ENCOUNTERED DURING INSTALLATION OF DRAINAGE STRUCTURES, EXCEPT STORMWATER MANAGEMENT FACILITIES.
5. THE CONTRACTOR SHALL VERIFY ALL PIPE LENGTHS AND SIZES IN THE FIELD BEFORE ORDERING ANY DRAINAGE STRUCTURES
6. ALL BENCHMARKS AND COORDINATES SHOWN ON THE CONTRACT PLANS ARE "NAD83–91" AND "NAVD 88".
7. ALL EXISTING UTILITY FRAMES AND GRATES WITHIN THE LIMITS OF CONSTRUCTION SHALL BE ADJUSTED TO FINISHED GRADE.
8. THE CONTRACTOR WILL NOTIFY PROPERTY OWNERS 72 HOURS PRIOR TO IMPACTS OR OBSTRUCTIONS OF DRIVEWAY ENTRANCES.

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

REVISIONS
3 GMP NO.3 09/30/2022

NOTES AND ABBREVIATIONS SHEET

SCALE NTS ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16–PR–0050–03
COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. AB-01 OF 01
SHEET NO. 224 OF 260

WHITNEY BAILEY COX & MAGNANI, LLC
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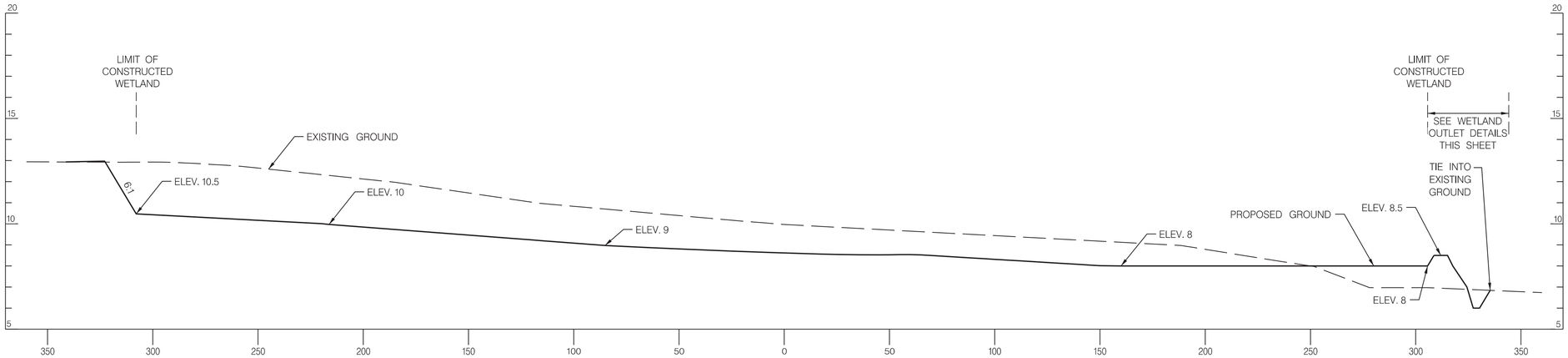
Baltimore, MD 21286
410.512.4500 www.wbcm.com
WBCM

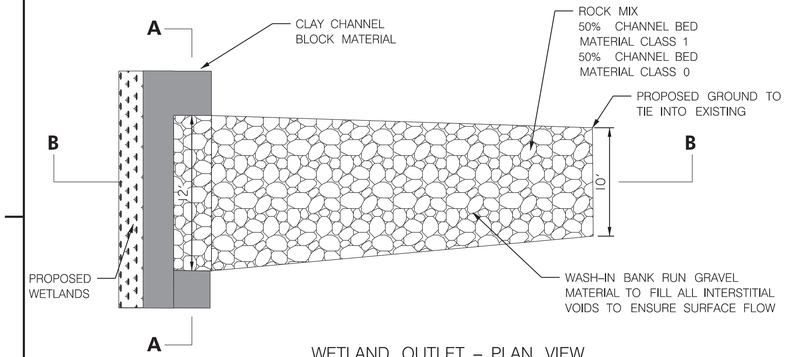
BY: arussell –

PLOTTED: 6/30/2022



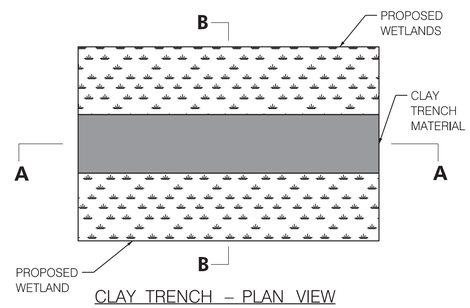
CONSTRUCTED WETLAND CROSS SECTION

HORIZ. SCALE: 1" = 30'
VERT. SCALE: 1" = 3'



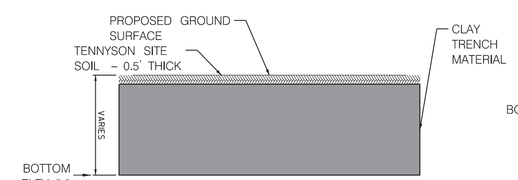
WETLAND OUTLET – PLAN VIEW

SCALE: N.T.S.



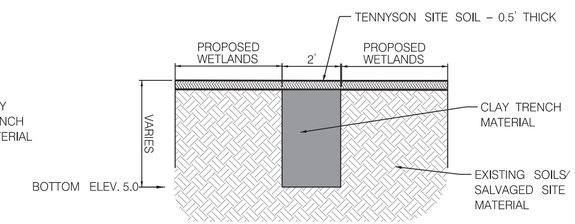
CLAY TRENCH – PLAN VIEW

SCALE: N.T.S.



CLAY TRENCH – SECTION A–A

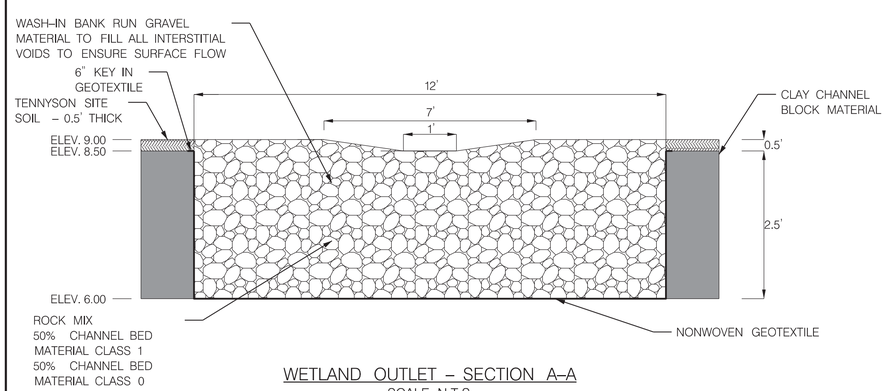
SCALE: N.T.S.



NOTE: OFFSET MICROTOPOGRAPHY MINIMUM 5–FEET FROM EDGE OF CLAY TRENCH.

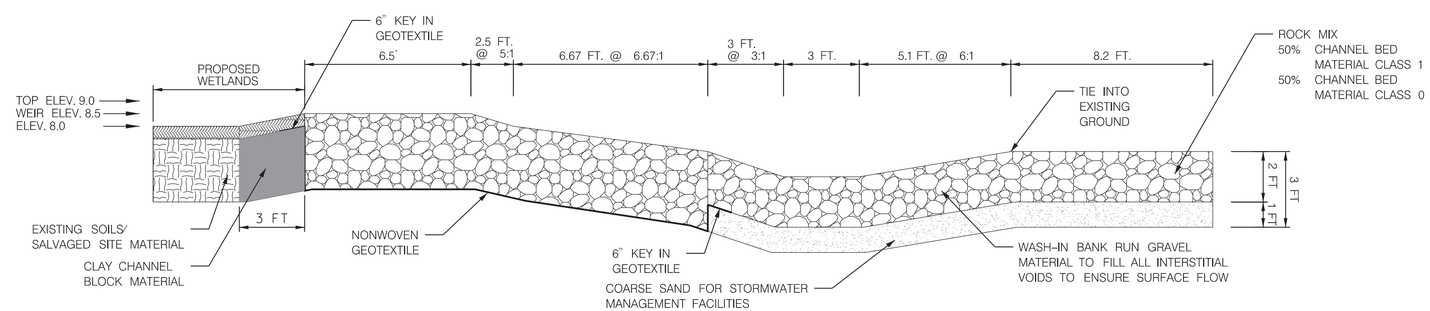
CLAY TRENCH – SECTION B–B

SCALE: N.T.S.



WETLAND OUTLET – SECTION A–A

SCALE: N.T.S.



WETLAND OUTLET – SECTION B–B

SCALE: N.T.S.

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com
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R /W PLAT NUMBER

CROSS REFERENCE

ITEM	SHEET NOs.
TYPICAL SHEETS	WT–10 TO WT–12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS–01
ROADWAY PLAN SHEETS	PS–19 TO PS–36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES–01 TO ES–08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD–01 TO LD–09
UTILITIES	NA

REVISIONS

3 GMP NO.3 09/30/2022

WETLAND MITIGATION SECTION & DETAILS

SCALE NTS ADVERTISED DATE – CONTRACT NO. SM7745171B

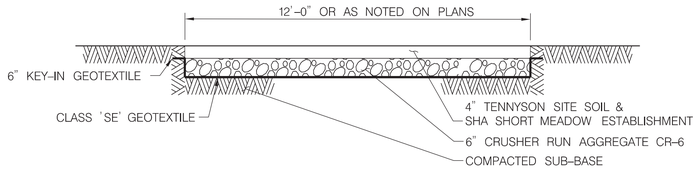
DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16–PR–0050–03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE NTS
VERTICAL SCALE NTS

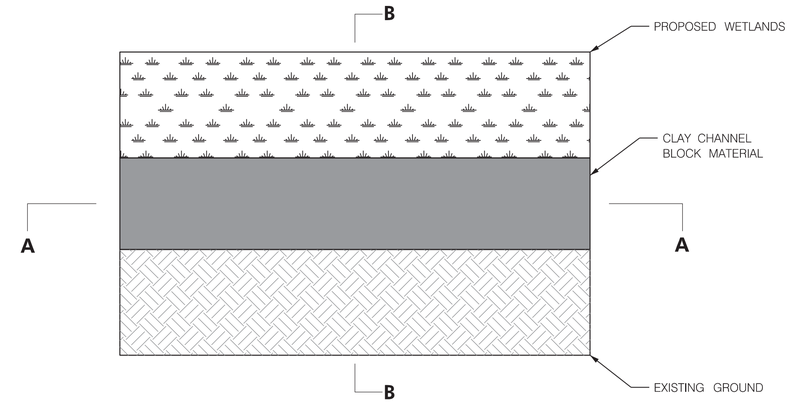
DRAWING NO. DE-01 OF 03 SHEET NO. 225 OF 260

BY: arussell –

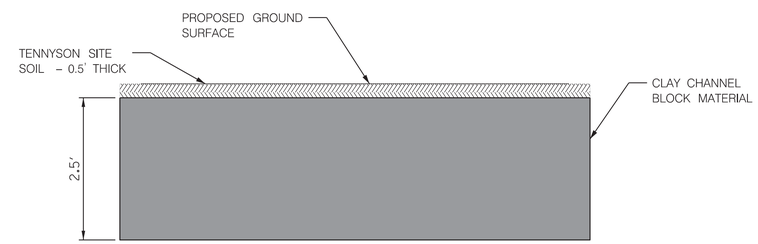
PLOTTED: 6/21/2022



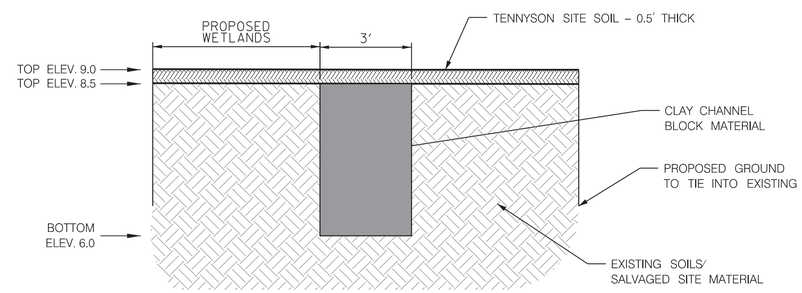
PERMANENT ACCESS ROAD
SCALE: N.T.S.



CLAY CHANNEL BLOCK – PLAN VIEW
SCALE: N.T.S.



CLAY CHANNEL BLOCK – SECTION A–A
SCALE: N.T.S.



NOTE: OFFSET MICROTOPOGRAPHY MINIMUM 5–FEET FROM EDGE OF CLAY CHANNEL BLOCK.

CLAY CHANNEL BLOCK – SECTION B–B
SCALE: N.T.S.

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com

WBCM

R /W PLAT NUMBER

CROSS REFERENCE

ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-09
UTILITIES	NA

REVISIONS

3 GMP NO.3 09/30/2022

WETLAND MITIGATION DETAILS

SCALE NTS ADVERTISED DATE – CONTRACT NO. SM7745171B

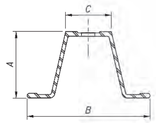
DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE NTS
VERTICAL SCALE NTS

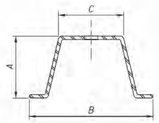
DRAWING NO. DE-02 OF 03

BY: arussell –

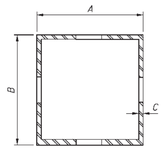
PLOTTED: 6/21/2022



TYPE P

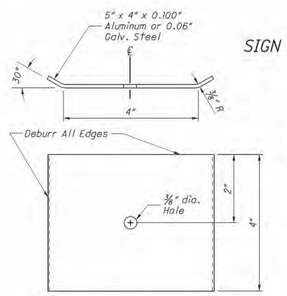


TYPE F

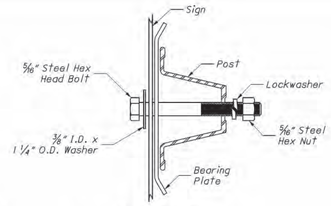


TYPE S

POST NO.	TYPE	LB/FT	POST DIMENSIONS (INCHES)			ANCHOR DIMENSIONS			# OF POSTS PERMITTED IN 7' PATH IN EXPOSED LOCATIONS
			A	B	C	A	B	C	
1	F	1.12	0.875	2.063	0.813				
2	P	2.00	1.469	3.063	1.281				2
	F	2.00	1.516	3.125	1.250				2
	S		1.750	1.750	0.083	2.000	2.000	0.105	2
3	P	3.00	1.875	3.500	1.313				2
	F	3.00	1.750	3.500	1.625				2
	S		2.00	2.00	0.083	2.250	2.250	0.105	2
4	P	4.00	TWO NO.2 POST						0
	F	4.00	TWO NO.2 POST						0
	S		2.500	2.500	0.105	3.000	3.000	0.188	1
6	P	6.00	TWO NO.3 POST						0
	F	6.00	TWO NO.3 POST						0



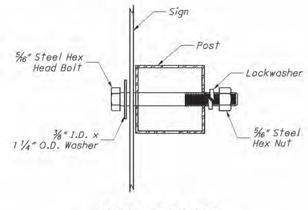
BEARING PLATE



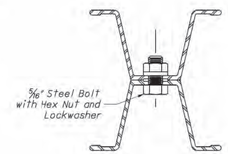
U-CHANNEL SIGN ATTACHMENT DETAIL

NOTES:

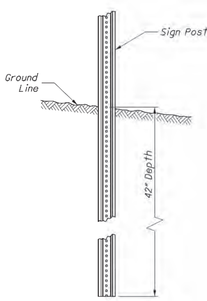
1. Install No. 4 type P and F posts, and No. 6 type P and F posts, only in protected locations (e.g., behind guardrail). Install two post installations of number 4 type S posts within 7 foot path only in protected locations.
2. Use of anchor base with No. 2 and No. 3 square post is optional. Use of anchor base with No. 4 square post is required.
3. Square post may have die-cut knockouts or open holes.



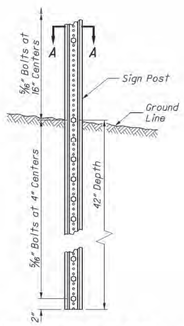
SQUARE POST SIGN ATTACHMENT DETAIL



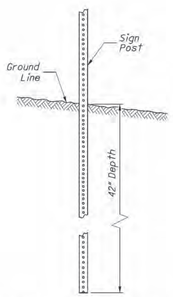
SECTION A-A



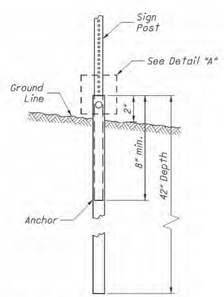
TYPICAL NO. 1, NO. 2 AND NO. 3 U-CHANNEL DRIVEN INSTALLATION



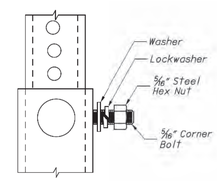
TYPICAL NO. 4 AND NO. 6 U-CHANNEL DRIVEN INSTALLATION



TYPICAL SQUARE POST DRIVEN INSTALLATION



TYPICAL SQUARE POST ANCHOR BASE INSTALLATION



DETAIL "A"

THIS DRAWING REPLACES TC-41.20 DATED 01-19-2001.

STANDARD ROADWAY CONSTRUCTION DRAWING

YIELDING POST

SEED NUMBER TC-41.20

1 / 1

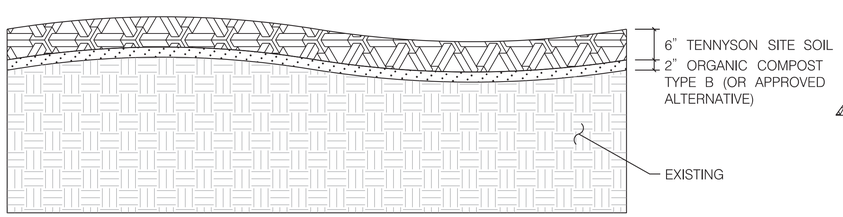
STATE OF OHIO DEPARTMENT OF TRANSPORTATION

10-18-2013 DATE

CHIEF ENGINEER

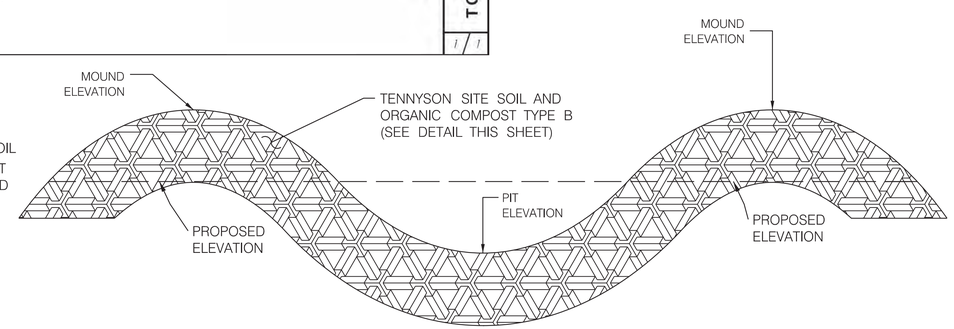
CIVIL ENGINEER H. Sufer

OFFICE OF ROADWAY ENGINEERING



PLACE TENNYSON SITE SOIL AND ORGANIC COMPOST TYPE B DETAIL

NOT TO SCALE



MICROTOPOGRAPHY DETAIL – FURNISHED SURFACE ROUGHNESS

NOT TO SCALE

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

NOTES:

1. CONSTRUCT MICROTOPOGRAPHY IN ACCORDANCE WITH THE WETLAND MICROTOPOGRAPHY SPECIFICATION.
2. MOUNDS/PITS TO BE APPROXIMATELY PLUS/MINUS 0.5 FT FROM PROPOSED GRADE, RESPECTIVELY.
3. CONTRACTOR TO ENSURE THAT THE MICROTOPOGRAPHY IS APPROXIMATELY 30% PITS AND 20% MOUNDS WITH THE REMAINING 50% BEING TRANSITIONSL WITH LESS THAN 20% AT THE PROPOSED GRADE.

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com
WBCM

BY: arussell –

PLOTTED: 6/21/2022

R /W PLAT NUMBER

CROSS REFERENCE	
ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-09
UTILITIES	NA

REVISIONS
3 GMP NO.3 09/30/2022

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WETLAND MITIGATION DETAILS

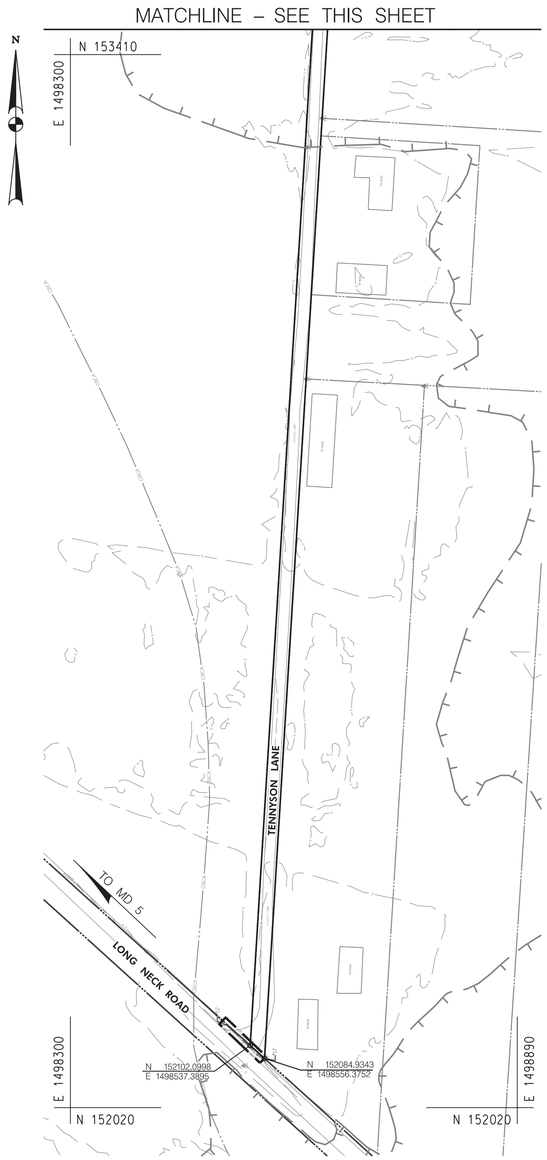
SCALE NTS ADVERTISED DATE – CONTRACT NO. SM7745171B

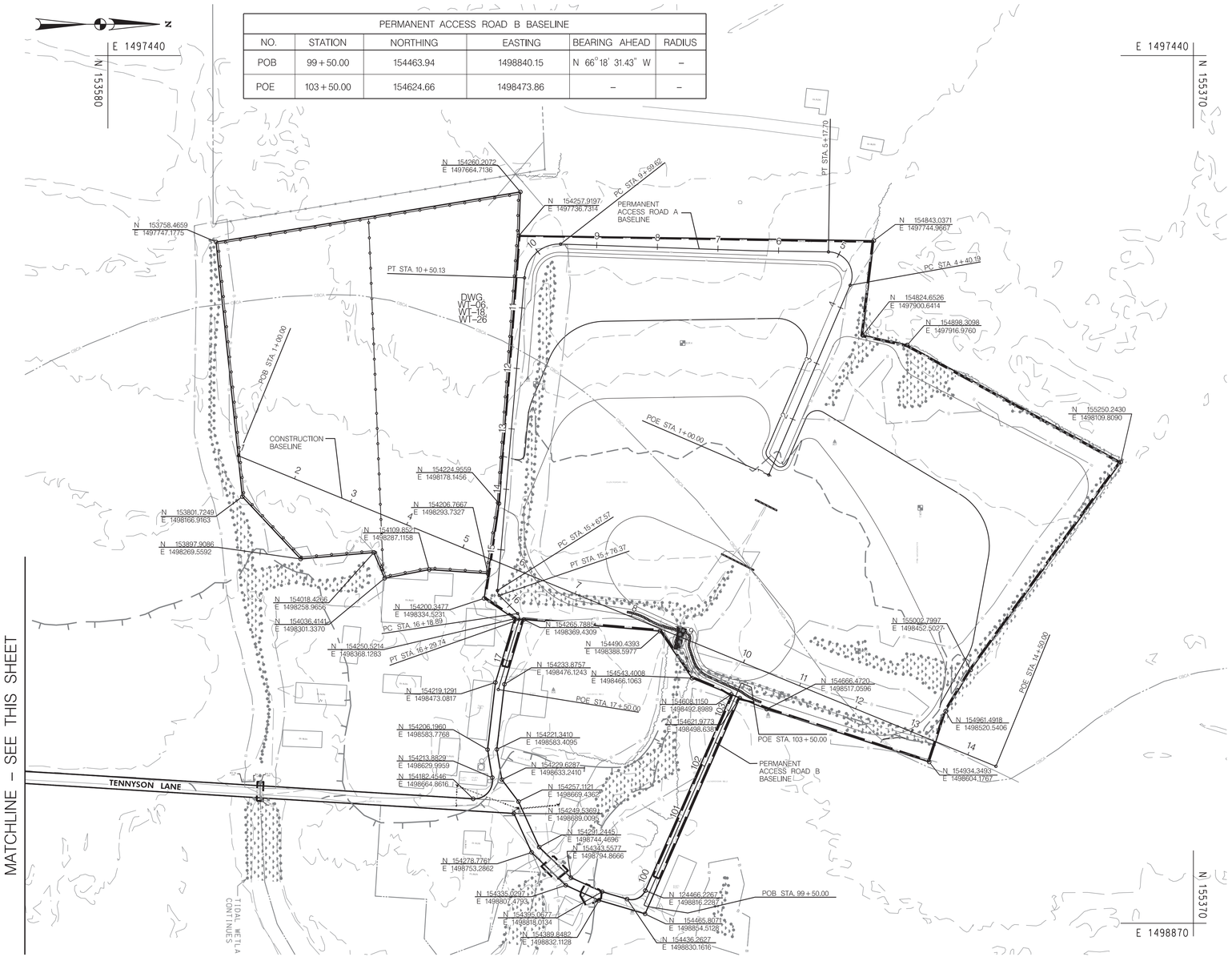
DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE NTS
VERTICAL SCALE N\A

DRAWING NO. DE-03 OF 03

SHEET NO. 227 OF 260





PERMANENT ACCESS ROAD B BASELINE					
NO.	STATION	NORTHING	EASTING	BEARING AHEAD	RADIUS
POB	99+50.00	154463.94	1498840.15	N 66°18' 31.43" W	–
POE	103+50.00	154624.66	1498473.86	–	–

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

PERMANENT ACCESS ROAD A BASELINE					
NO.	STATION	NORTHING	EASTING	BEARING AHEAD	RADIUS
POB	1+00.00	154669.83	1498131.10	N 66°46' 10.75" W	–
PC	4+40.19	154804.01	1497818.49	–	39.50
PT	5+17.70	154768.27	1497763.41	S 0°48' 36.18" W	–
PC	9+59.62	154326.53	1497750.57	–	57.50
PT	10+50.13	154267.06	1497806.22	S 88°11' 39.61" E	–
PC	15+67.57	154222.41	1498321.73	–	10.00
PT	15+76.37	154225.36	1498329.73	N 44°31' 02.29" E	–
PC	16+18.89	154255.68	1498359.54	–	10.00
PT	16+29.74	154258.25	1498369.53	S 73°20' 44.09" E	–
POE	17+50.00	154223.78	1498484.75	–	–

CONSTRUCTION BASELINE					
NO.	STATION	NORTHING	EASTING	BEARING AHEAD	RADIUS
POB	1+00.00	153795.17	1498099.52	N 22°16' 48.27" E	–
POE	14+50.00	155044.38	1498611.35	–	–

100' 0 100' 200'
SCALE: 1" = 100'

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com

R / W PLAT NUMBER

CROSS REFERENCE

ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-09
UTILITIES	NA

REVISIONS

3 GMP NO.3 09/30/2022

WETLAND MITIGATION GEOMETRY SHEET

SCALE 1" = 100' ADVERTISED DATE – CONTRACT NO. SM7745171B

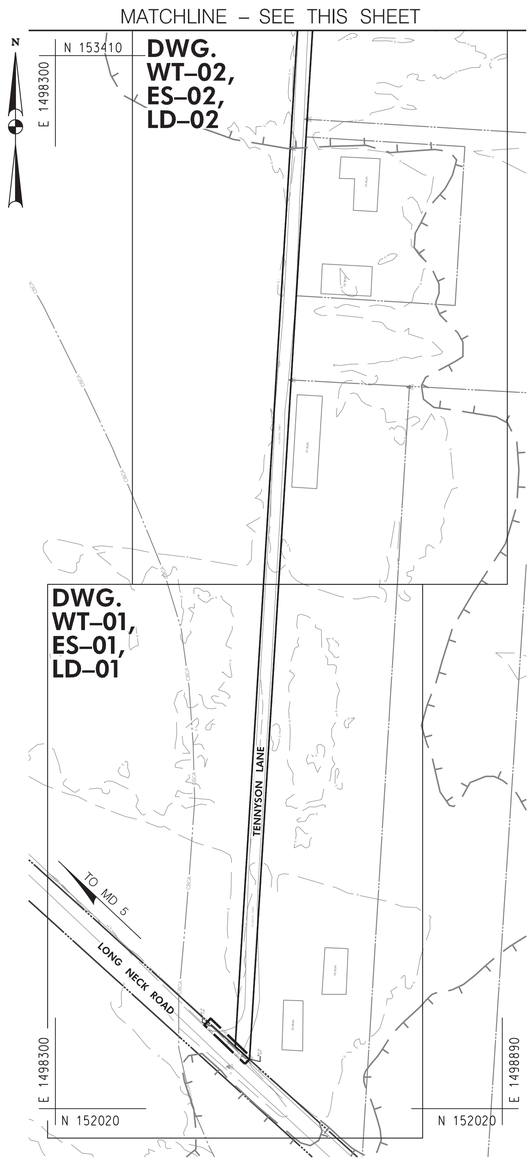
DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03

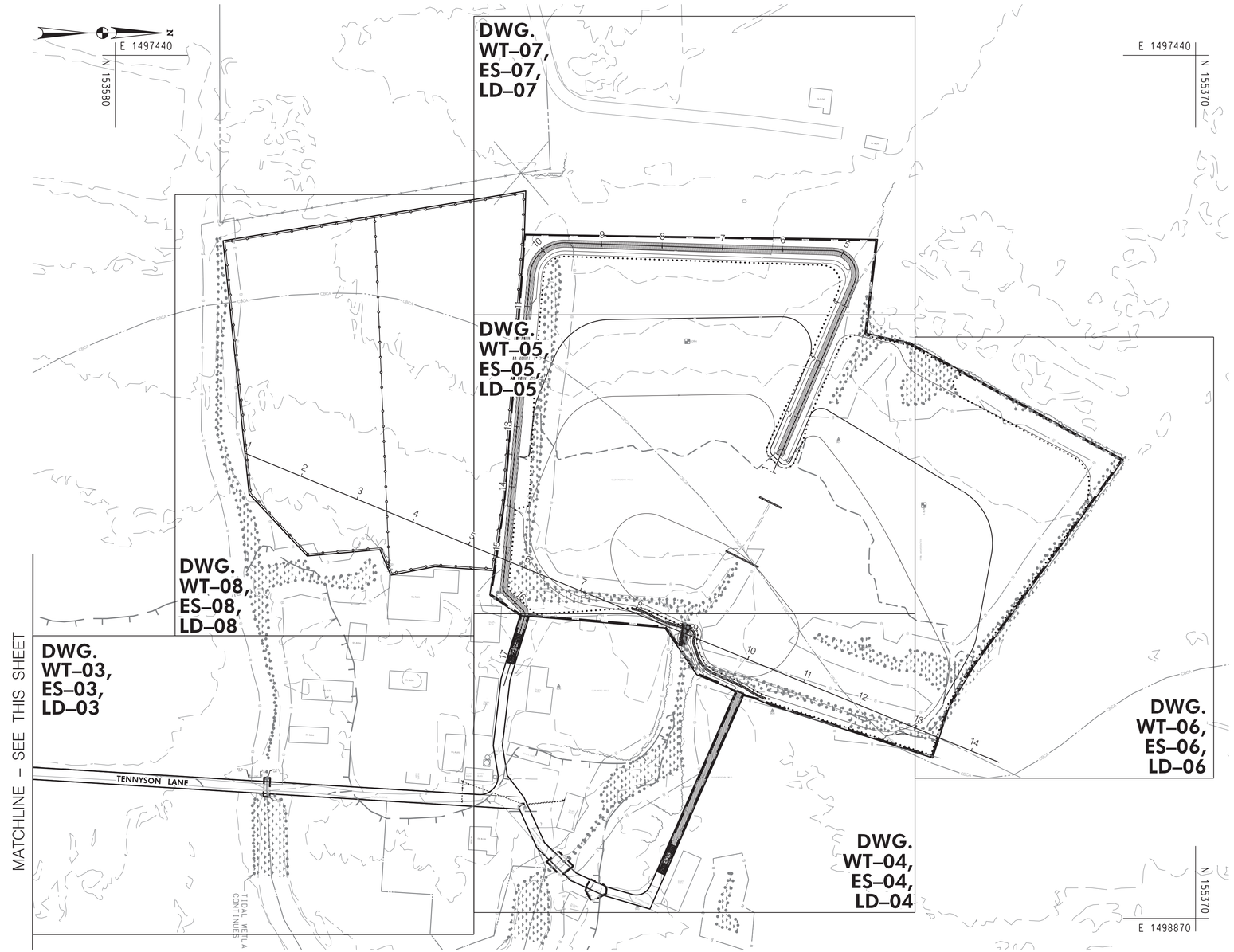
COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. GS-01 OF 01 SHEET NO. 228 OF 260

BY: oward –

PLOTTED: 8/15/2022





MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

100' 0 100' 200'
SCALE: 1" = 100'
DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com

R /W PLAT NUMBER

CROSS REFERENCE	
ITEM	SHEET NOs.
TYPICAL SHEETS	WT–10 TO WT–12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS–01
ROADWAY PLAN SHEETS	PS–19 TO PS–36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES–01 TO ES–08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD–01 TO LD–09
UTILITIES	NA

REVISIONS
3 GMP NO.3 09/30/2022

WETLAND MITIGATION KEY MAP

SCALE 1" = 100' ADVERTISED DATE – CONTRACT NO. SM7745171B

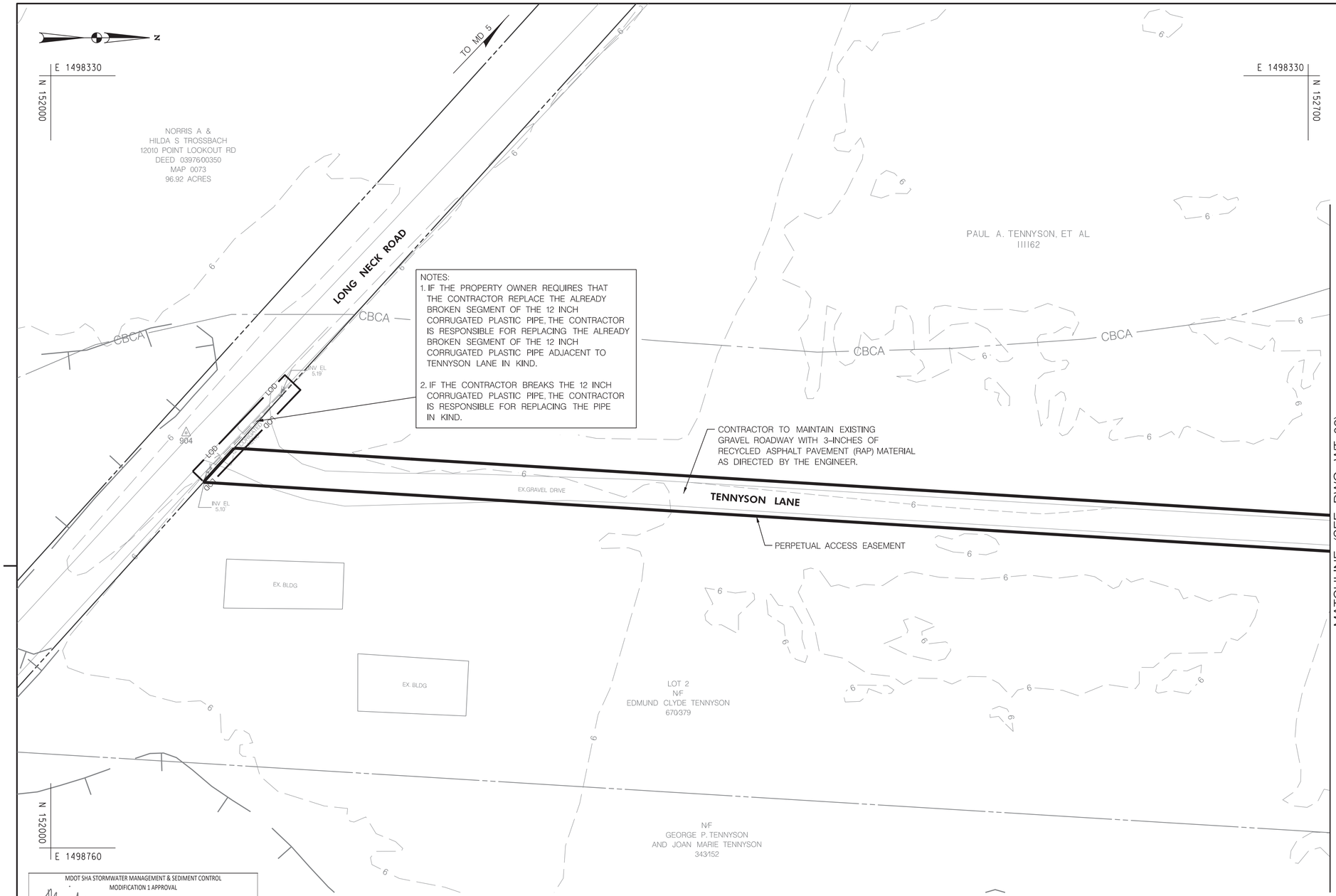
DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE 1" = 100'
VERTICAL SCALE N\A

DRAWING NO. KM-01 OF 01 SHEET NO. 229 OF 260

BY: oward –

PLOTTED: 8/15/2022



QUANTITY NOTES

RECYCLED ASPHALT PAVEMENT (RAP) FOR MAINTENANCE OF TENNYSON LANE	
119 TONS	EXISTING GRAVEL DRIVE – THIS SHEET (WT-01)

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

LEGEND

PROPOSED WETLAND		4 WIRE HIGH TENSILE ELECTRIC FENCE	EXISTING MAJOR CONTOUR
CLAY CHANNEL BLOCK		PROPOSED MAJOR CONTOUR	EXISTING MINOR CONTOUR
CLAY TRENCH		PROPOSED MINOR CONTOUR	PROPERTY LINE
WETLAND OUTFALL	LOD	LIMIT OF DISTURBANCE	EX. RIGHT OF WAY
PERMANENT ACCESS ROAD	B	25' PROPOSED WETLAND BUFFER	EXISTING WETLAND
PROPOSED EASEMENTS		EDGE OF ROADWAY	25' EXISTING WETLAND BUFFER

30' 0 30' 60'
SCALE: 1" = 30'

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
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410.512.4500 www.wbcm.com
WBCM

R / W PLAT NUMBER

CROSS REFERENCE	
ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-09
UTILITIES	NA

REVISIONS
3 GMP NO.3 09/30/2022

WETLAND MITIGATION PLAN SHEET

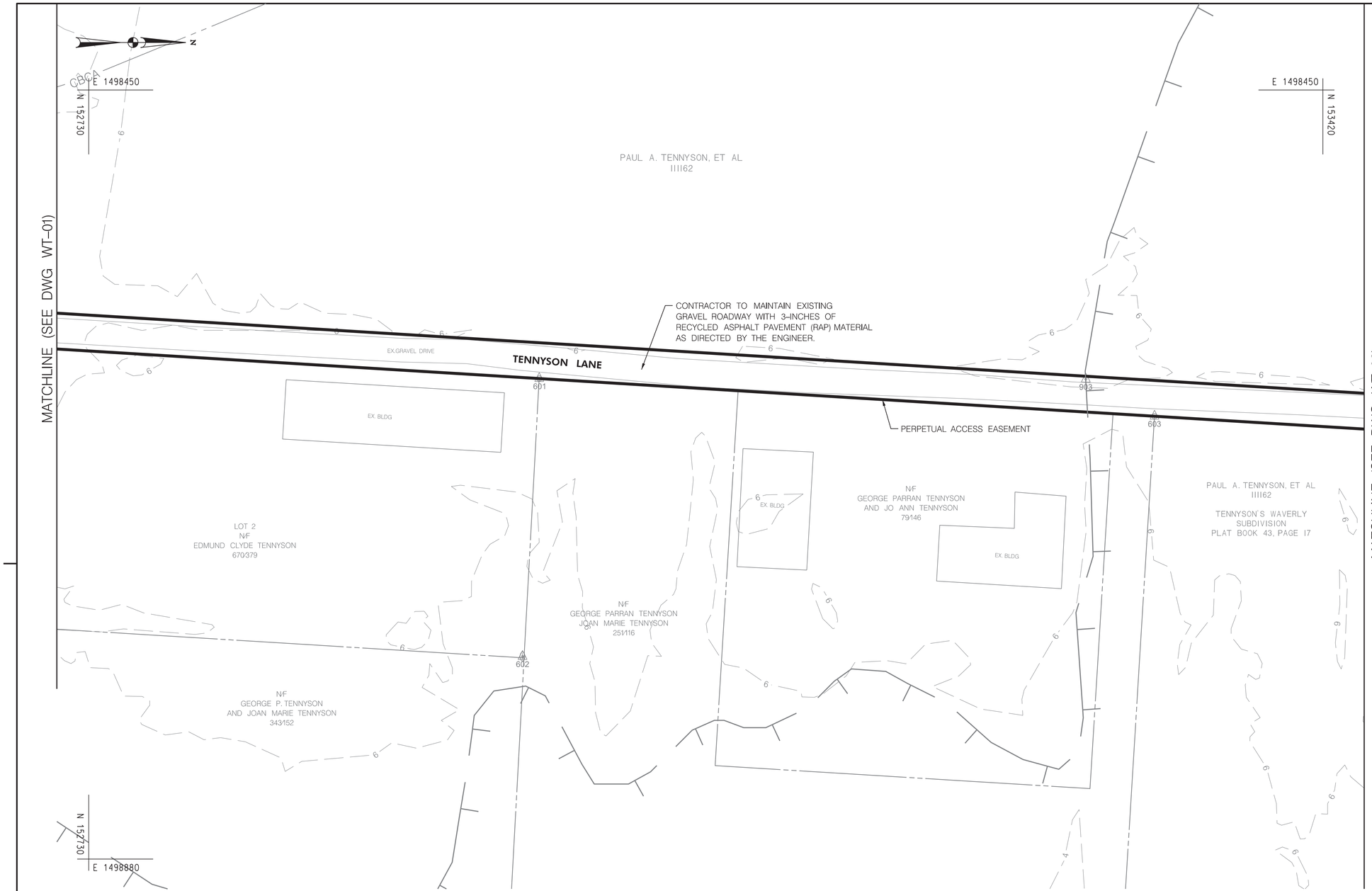
SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03
COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. WT-01 OF 12 SHEET NO. 230 OF 260

BY: oward –

PLOTTED: 8/15/2022



MATCHLINE (SEE DWG WT-01)

MATCHLINE (SEE DWG WT-03)

30' 0 30' 60'
SCALE: 1" = 30'

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

QUANTITY NOTES

RECYCLED ASPHALT PAVEMENT (RAP) FOR MAINTENANCE OF TENNYSON LANE
142 TONS EXISTING GRAVEL DRIVE – THIS SHEET (WT-02)

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

LEGEND

- PROPOSED WETLAND
- CLAY CHANNEL BLOCK
- CLAY TRENCH
- WETLAND OUTFALL
- PERMANENT ACCESS ROAD
- PROPOSED EASEMENTS
- 4 WIRE HIGH TENSILE ELECTRIC FENCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- LIMIT OF DISTURBANCE
- 25' PROPOSED WETLAND BUFFER
- EDGE OF ROADWAY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EX. RIGHT OF WAY
- EXISTING WETLAND
- 25' EXISTING WETLAND BUFFER

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com

WBCM

R / W PLAT NUMBER

CROSS REFERENCE	
ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-09
UTILITIES	NA

REVISIONS
3 GMP NO.3 09/30/2022

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WETLAND MITIGATION PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. WT-02 OF 12 SHEET NO. 231 OF 260

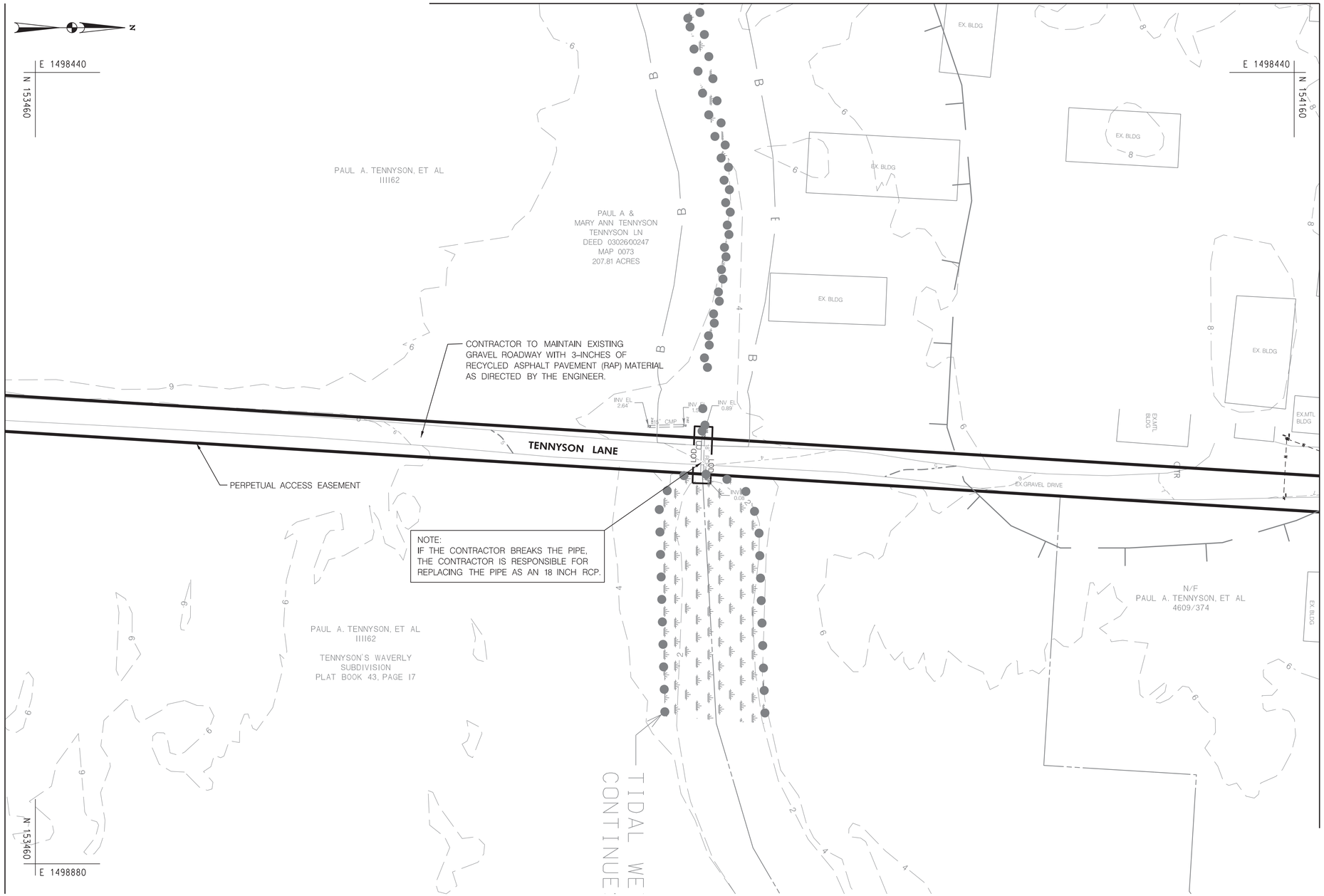
BY: oward –

PLOTTED: 8/15/2022

MATCHLINE (SEE DWG WT-08)

MATCHLINE (SEE DWG WT-02)

MATCHLINE (SEE DWG WT-04)



NOTE:
THIS SHEET IS ENTIRELY WITHIN THE CHESAPEAKE BAY CRITICAL AREA.

30' 0 30' 60'
SCALE: 1" = 30'
DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

LEGEND

PROPOSED WETLAND	4 WIRE HIGH TENSILE ELECTRIC FENCE	EXISTING MAJOR CONTOUR
CLAY CHANNEL BLOCK	PROPOSED MAJOR CONTOUR	EXISTING MINOR CONTOUR
CLAY TRENCH	PROPOSED MINOR CONTOUR	PROPERTY LINE
WETLAND OUTFALL	LIMIT OF DISTURBANCE (LOD)	EX. RIGHT OF WAY
PERMANENT ACCESS ROAD	25' PROPOSED WETLAND BUFFER (B)	EXISTING WETLAND
PROPOSED EASEMENTS	EDGE OF ROADWAY	25' EXISTING WETLAND BUFFER (B)

QUANTITY NOTES

RECYCLED ASPHALT PAVEMENT (RAP) FOR MAINTENANCE OF TENNYSON LANE
127 TONS EXISTING GRAVEL DRIVE – THIS SHEET (WT-03)

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
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TENNYSON WETLAND MITIGATION SITE

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WBCM

R /W PLAT NUMBER

CROSS REFERENCE	
ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-01
UTILITIES	NA

REVISIONS
3 GMP NO.3 09/30/2022

WETLAND MITIGATION PLAN SHEET

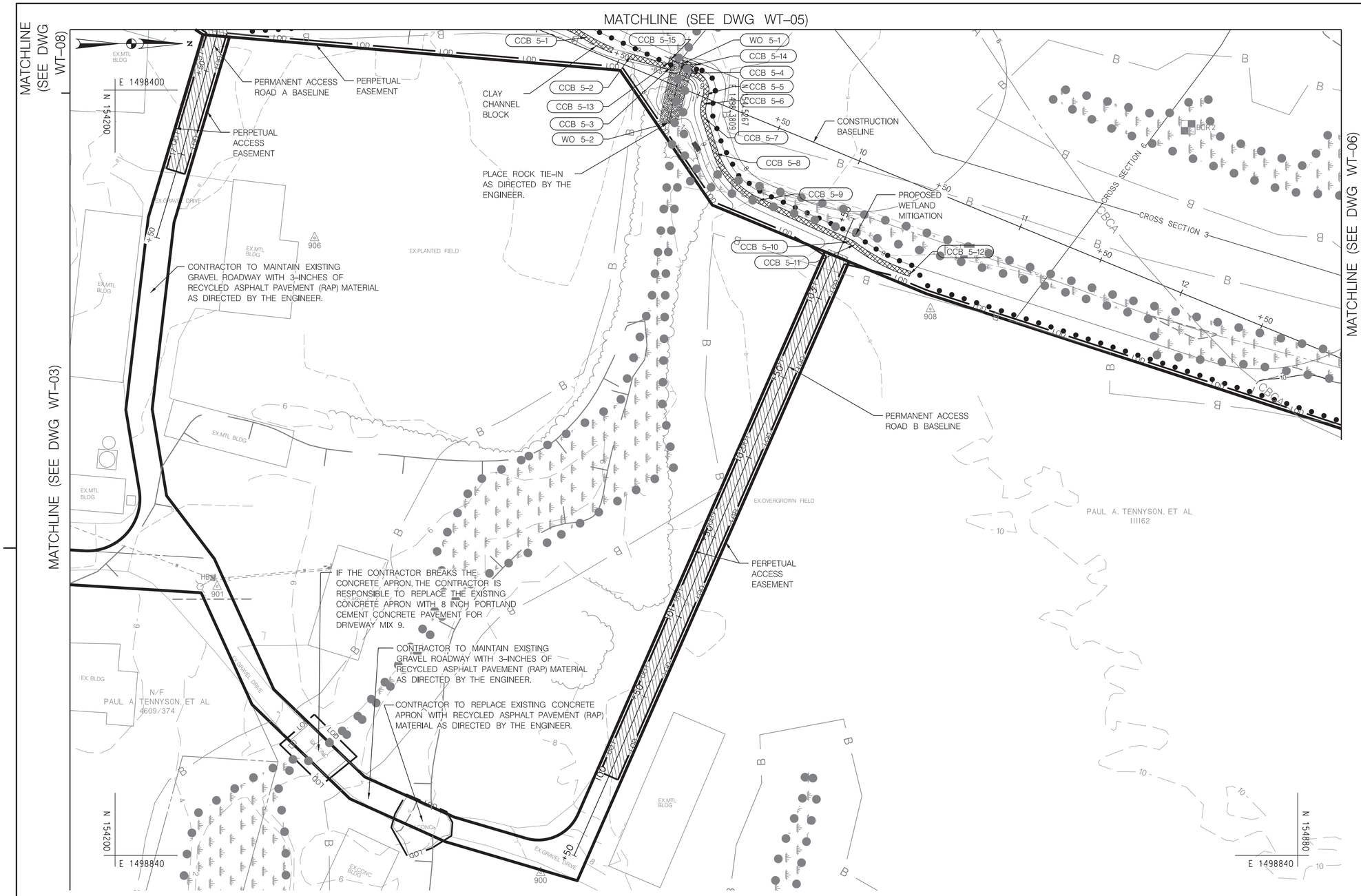
SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH COUNTY ST. MARYS
DRAWN BY ALN LOGMILE
CHECKED BY BN HORIZONTAL SCALE
MDE/PRD 16-PR-0050-03 VERTICAL SCALE

DRAWING NO. WT-03 OF 12 SHEET NO. 232 OF 260

BY: oward –

PLOTTED: 8/15/2022



MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

LEGEND

- PROPOSED WETLAND
- CLAY CHANNEL BLOCK
- CLAY TRENCH
- WETLAND OUTFALL — LOD —
- PERMANENT ACCESS ROAD — B —
- PROPOSED EASEMENTS
- 4 WIRE HIGH TENSILE ELECTRIC FENCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- LIMIT OF DISTURBANCE
- 25' PROPOSED WETLAND BUFFER — B —
- EDGE OF ROADWAY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EX. RIGHT OF WAY
- EXISTING WETLAND
- 25' EXISTING WETLAND BUFFER — B —

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WBCM

QUANTITY NOTES

CLASS 1 EXCAVATION
2,125 CY WT-04

COMMON BORROW
242 CY WT-04

MICROTOPOGRAPHY
6,527 SY WT-04

CLAY CHANNEL BLOCK (276 LF)*

NO.	NORTHING	EASTING	STATION	OFFSET
CCB 5-1	154,471	1,498,370	8+28	6 L
CCB 5-2	154,496	1,498,381	8+55	6 L
CCB 5-3	154,519	1,498,387	8+79	11 L
CCB 5-4	154,531	1,498,390	8+91	10 L
CCB 5-5	154,540	1,498,403	9+04	2 R
CCB 5-6	154,538	1,498,408	9+05	4 R
CCB 5-7	154,546	1,498,416	9+08	11 R
CCB 5-8	154,546	1,498,436	9+22	27 R
CCB 5-9	154,570	1,498,463	9+55	43 R
CCB 5-10	154,622	1,498,487	10+12	45 R
CCB 5-11	154,625	1,498,489	10+16	46 R
CCB 5-12	154,657	1,498,506	10+53	49 R
CCB 5-13	154,518	1,498,384	8+79	9 L
CCB 5-14	154,533	1,498,386	8+91	15 L
CCB 5-15	154,520	1,498,382	8+78	13 L

ROCK MIX CHANNEL BED MATERIAL (37 CY)*

NO.	NORTHING	EASTING	STATION	OFFSET
WO 5-1	154,525	1,498,387	8+85	11 L
WO 5-2	154,518	1,498,419	8+90	21 R

SEE DETAIL ON SHEET DE-01 FOR ADDITIONAL INFORMATION

COARSE SAND FOR STORMWATER MANAGEMENT FACILITIES	
8 CY	WETLAND OUTLET – SEE DETAIL ON SHEET DE-01

* STATION AND OFFSET BASED OF THE CONSTRUCTION BASELINE.

PERMANENT ACCESS ROAD	
114 SY	PERMANENT ACCESS ROAD BASELINE – 16+25 TO 17+10
438 SY	PERMANENT ACCESS ROAD BASELINE – 100+00 TO 103+28

REMOVAL OF EXISTING PAVEMENT	
38 CY	PERMANENT ACCESS ROAD BASELINE – 99+50, 86' LT.

RECYCLED ASPHALT PAVEMENT (RAP) FOR MAINTENANCE OF TENNYSON LANE	
132 TONS	EXISTING GRAVEL DRIVE – THIS SHEET (WT-04)

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

R /W PLAT NUMBER

CROSS REFERENCE

ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-09
UTILITIES	NA

REVISIONS

3 GMP NO.3 09/30/2022

WETLAND MITIGATION PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

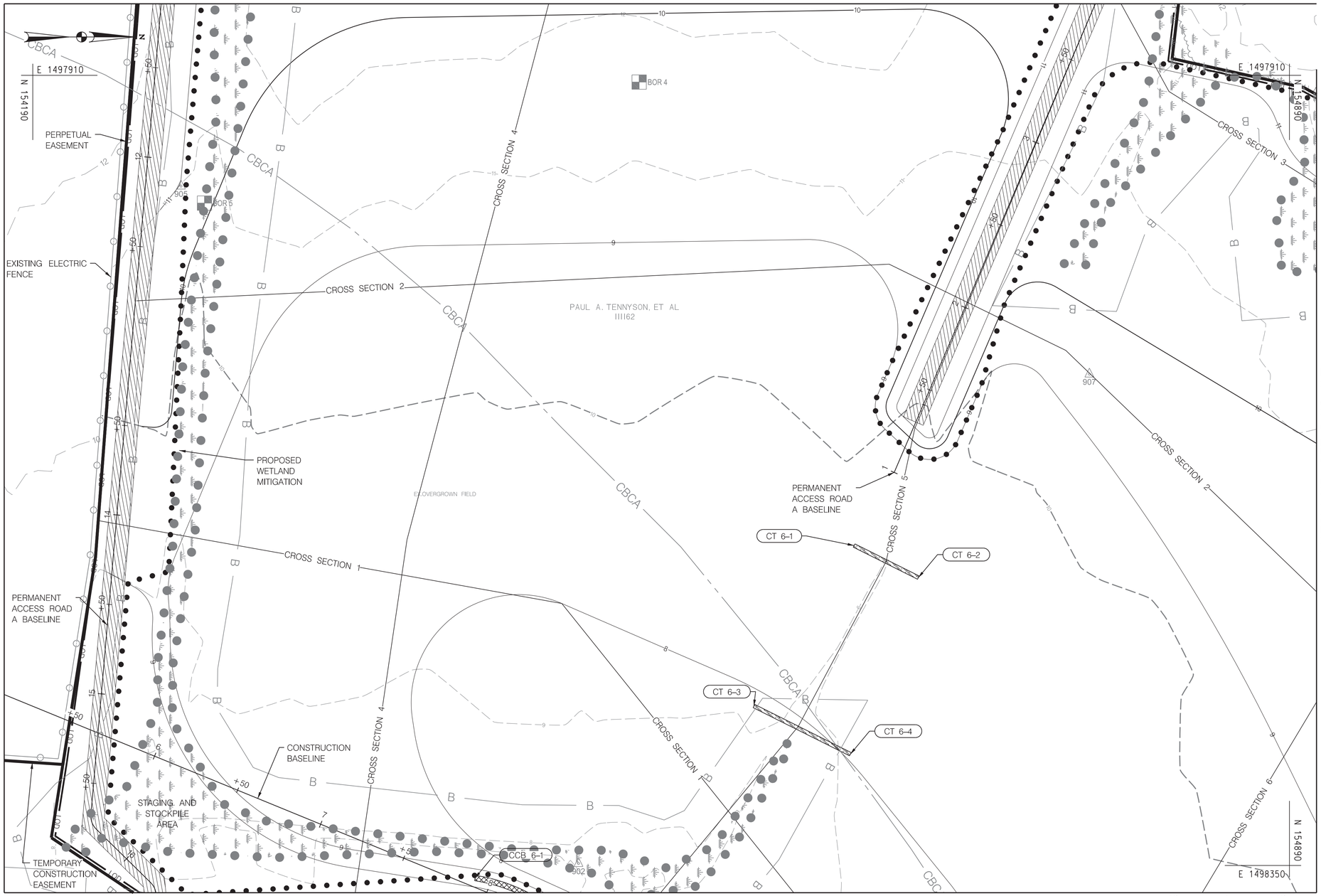
DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03
COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. WT-04 OF 12 SHEET NO. 233 OF 260

BY: oward –

PLOTTED: 8/15/2022

MATCHLINE (SEE DWG WT–07)



MATCHLINE (SEE DWG WT–08)

MATCHLINE (SEE DWG WT–06)

MATCHLINE (SEE DWG WT–04)

SCALE: 1" = 30'

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

QUANTITY NOTES

CLASS 1 EXCAVATION
12,448 CY WT–05

COMMON BORROW
442 CY WT–05

MICROTOPOGRAPHY
33,483 SY WT–05

PERMANENT ACCESS ROAD	
337 SY	PERMANENT ACCESS ROAD BASELINE – 1+28 TO 3+84
682 SY	PERMANENT ACCESS ROAD BASELINE – 16+27 TO 11+14

CLAY CHANNEL BLOCK (25 LF)*				
NO.	NORTHING	EASTING	STATION	OFFSET
CCB 6–1	154,436	1,498,357	7+91	5 L

CLAY TRENCH (100 LF)*				
NO.	NORTHING	EASTING	STATION	OFFSET
CT 6–1	154,647	1,498,172	9+16	256 L
CT 6–2	154,683	1,498,190	9+56	253 L
CT 6–3	154,592	1,498,261	8+93	152 L
CT 6–4	154,645	1,498,288	9+58	148 L

* STATION AND OFFSET BASED OF THE CONSTRUCTION BASELINE.

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

LEGEND

- PROPOSED WETLAND
- CLAY CHANNEL BLOCK
- CLAY TRENCH
- WETLAND OUTFALL
- PERMANENT ACCESS ROAD
- PROPOSED EASEMENTS
- 4 WIRE HIGH TENSILE ELECTRIC FENCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- LIMIT OF DISTURBANCE (LOD)
- 25' PROPOSED WETLAND BUFFER (B)
- EDGE OF ROADWAY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EX. RIGHT OF WAY
- EXISTING WETLAND
- 25' EXISTING WETLAND BUFFER (B)

WHITNEY BAILEY COX & MAGNANI, LLC
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Baltimore, MD 21286
410.512.4500 www.wbcm.com
WBCM

R / W PLAT NUMBER

CROSS REFERENCE	
ITEM	SHEET NOs.
TYPICAL SHEETS	WT–10 TO WT–12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS–01
ROADWAY PLAN SHEETS	PS–19 TO PS–36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES–01 TO ES–08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD–01 TO LD–09
UTILITIES	NA

REVISIONS
3 GMP NO.3 09/30/2022

WETLAND MITIGATION PLAN SHEET

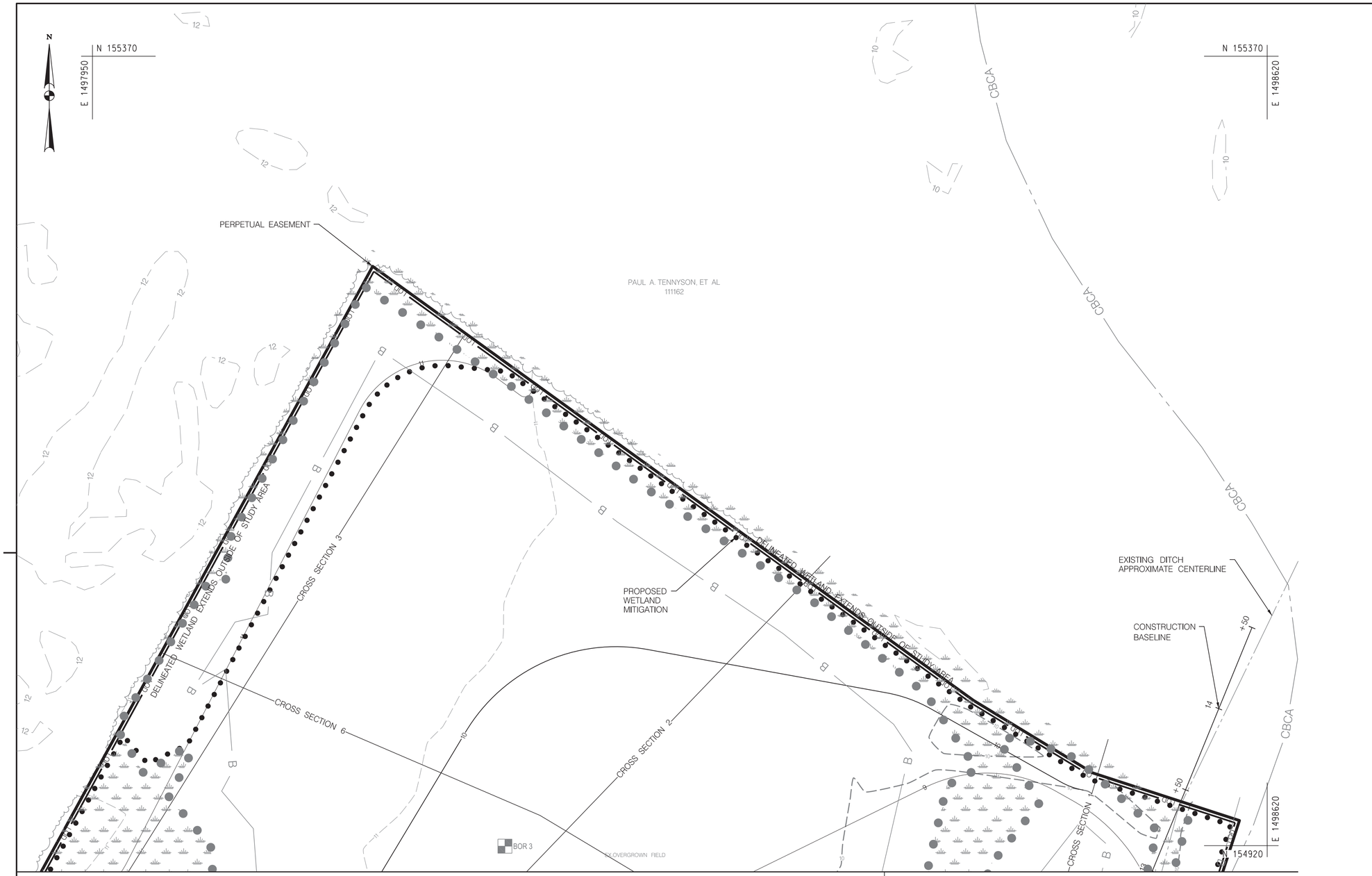
SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH COUNTY ST. MARYS
DRAWN BY ALN LOGMILE
CHECKED BY BN HORIZONTAL SCALE
MDE/PRD 16–PR–0050–03 VERTICAL SCALE

DRAWING NO. WT-05 OF 12 SHEET NO. 234 OF 260

BY: oward –

PLOTTED: 8/15/2022



QUANTITY NOTES

CLASS 1 EXCAVATION
2,101 CY WT–06

COMMON BORROW
80 CY WT–06

MICROTOPOGRAPHY
11,359 SY WT–06

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL 7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

30' 0 30' 60'
SCALE: 1" = 30'

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

LEGEND

- PROPOSED WETLAND
- CLAY CHANNEL BLOCK
- CLAY TRENCH
- WETLAND OUTFALL — LOD
- PERMANENT ACCESS ROAD — B
- PROPOSED EASEMENTS
- 4 WIRE HIGH TENSILE ELECTRIC FENCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- LIMIT OF DISTURBANCE
- 25' PROPOSED WETLAND BUFFER
- EDGE OF ROADWAY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EX. RIGHT OF WAY
- EXISTING WETLAND
- 25' EXISTING WETLAND BUFFER — B

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com

WBCM

R / W PLAT NUMBER

CROSS REFERENCE	
ITEM	SHEET NOs.
TYPICAL SHEETS	WT–10 TO WT–12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS–01
ROADWAY PLAN SHEETS	PS–19 TO PS–36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES–01 TO ES–08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD–01 TO LD–09
UTILITIES	

REVISIONS
3 GMP NO.3 09/30/2022

WETLAND MITIGATION PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

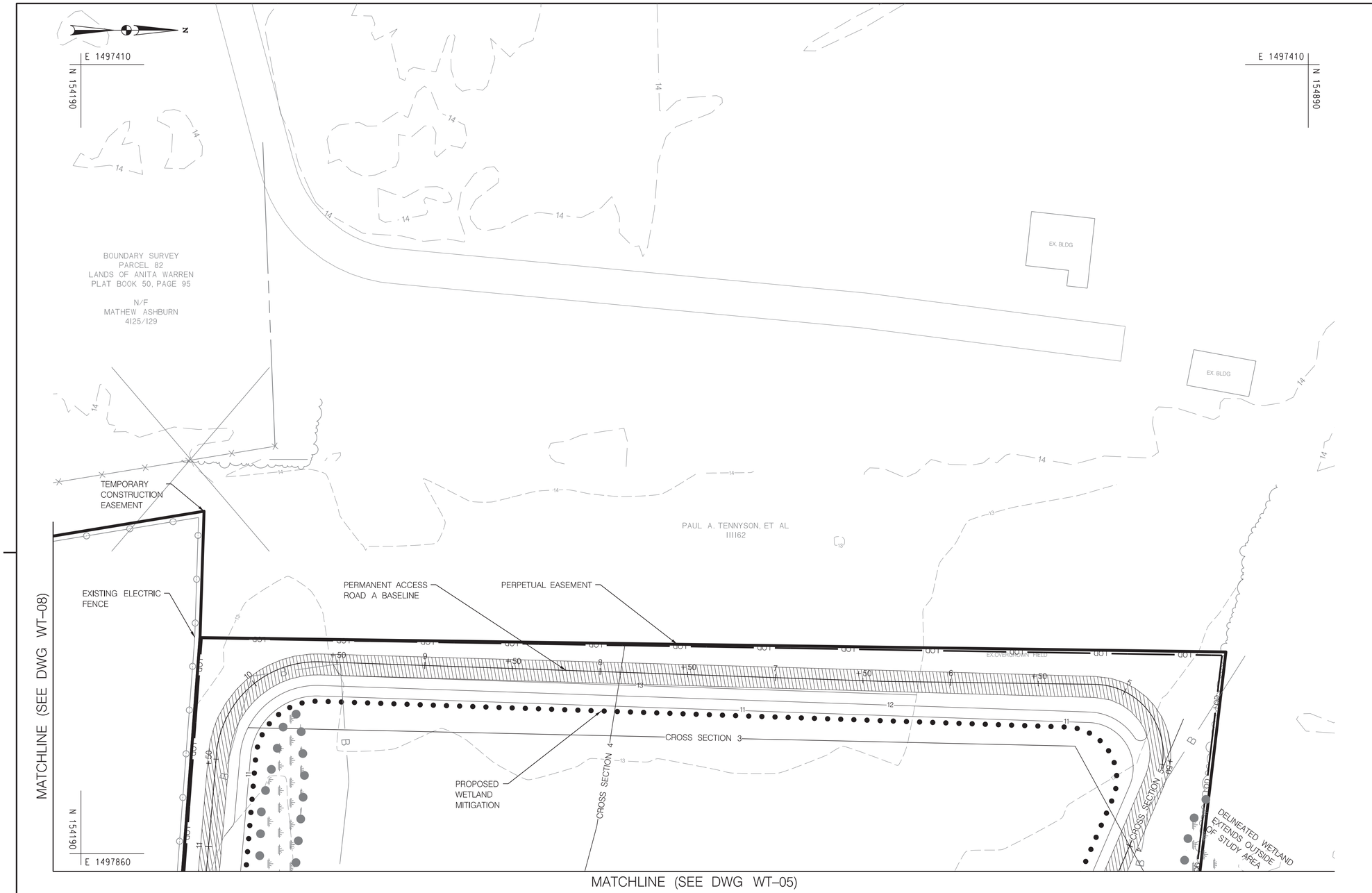
DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16–PR–0050–03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. WT-06 OF 12 SHEET NO. 235 OF 260

BY: oward –

PLOTTED: 8/15/2022



30' 0 30' 60'
SCALE: 1" = 30'

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

QUANTITY NOTES

CLASS 1 EXCAVATION
3,733 CY WT-07

COMMON BORROW
24 CY WT-07

MICROTOPOGRAPHY
4,821 SY WT-07

PERMANENT ACCESS ROAD
967 SY PERMANENT ACCESS ROAD BASELINE – 3+84 TO 11+14

* STATION AND OFFSET BASED OF THE CONSTRUCTION BASELINE.

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL 7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

LEGEND

- PROPOSED WETLAND
- CLAY CHANNEL BLOCK
- CLAY TRENCH
- WETLAND OUTFALL — LOD —
- PERMANENT ACCESS ROAD — B —
- PROPOSED EASEMENTS
- 4 WIRE HIGH TENSILE ELECTRIC FENCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- LIMIT OF DISTURBANCE
- 25' PROPOSED WETLAND BUFFER
- EDGE OF ROADWAY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EX. RIGHT OF WAY
- EXISTING WETLAND
- 25' EXISTING WETLAND BUFFER

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WBCM

R / W PLAT NUMBER

CROSS REFERENCE

ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-09
UTILITIES	NA

REVISIONS

3 GMP NO.3 09/30/2022

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WETLAND MITIGATION PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. WT-07 OF 12
SHEET NO. 236 OF 260

BY: oward –

PLOTTED: 8/15/2022

MATCHLINE (SEE DWG WT–07)

MATCHLINE (SEE DWG WT–05)

MATCHLINE (SEE DWG WT–04)

MATCHLINE (SEE DWG WT–03)

N 154160

E 1497700

N 154160

E 1498380

EXISTING ELECTRIC FENCE

EXISTING ELECTRIC FENCE

CONSTRUCTION BASELINE

EXISTING ELECTRIC FENCE

EXISTINMG ELECTRIC FENCE

EXISTING ELECTRIC FENCE

TEMPORARY CONSTRUCTION EASEMENT

CBCA

CBCA

CBCA

PAUL A. TENNYSON, ET AL
111162

EX BLDG

E 1497700

N 153690

30' 0 30' 60'

SCALE: 1" = 30'

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

LEGEND

- PROPOSED WETLAND
- CLAY CHANNEL BLOCK
- CLAY TRENCH
- WETLAND OUTFALL
- PERMANENT ACCESS ROAD
- PROPOSED EASEMENTS
- 4 WIRE HIGH TENSILE ELECTRIC FENCE
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- LIMIT OF DISTURBANCE
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- EDGE OF ROADWAY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY LINE
- EX. RIGHT OF WAY
- EXISTING WETLAND
- 25' EXISTING WETLAND BUFFER

QUANTITY NOTES

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
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MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

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410.512.4500 www.wbcm.com
WBCM

BY: oward –

R / W PLAT NUMBER

CROSS REFERENCE

ITEM	SHEET NOs.
TYPICAL SHEETS	WT–10 TO WT–12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS–01
ROADWAY PLAN SHEETS	PS–19 TO PS–36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES–01 TO ES–08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD–01 TO LD–09
UTILITIES	NA

REVISIONS

3 GMP NO.3 09/30/2022

WETLAND MITIGATION PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16–PR–0050–03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. WT-08 OF 12

SHEET NO. 237 OF 260

PLOTTED: 8/15/2022

AS–BUILT TABLES

WETLAND MITIGATION AS-BUILT CERTIFICATION FORM

I HEREBY CERTIFY THAT THE WETLAND MITIGATION SITE SHOWN ON THE PLANS HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE CONTRACT NUMBER ____SM7745171___ EXCEPT AS NOTED IN GREEN ON THE "AS-BUILT" DRAWINGS. FURTHERMORE, THE GREEN-NOTED EXCEPTIONS DO NOT ADVERSELY AFFECT THE DESIGN AND/OR THE INTENDED PERFORMANCE OF THE SITE.

Name (Printed) Signature

Maryland Registration Number Date

PROFESSIONAL CERTIFICATION: "I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. _____, EXPIRATION DATE_____."

"CERTIFY" MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED ON SUFFICIENT AND APPROPRIATE ONSITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION.

WETLAND MITIGATION SOIL AMENDMENT
DESIGNATED SPECIALIST ACKNOWLEDGEMENT FORM

I HEREBY ACKNOWLEDGE, BASED ON VISUAL INSPECTION, THAT THE WETLAND MITIGATION SITE SHOWN ON THE PLANS HAS BEEN CONSTRUCTED WITH THE STATED SOIL AMENDMENT IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE CONTRACT NUMBER ____SM7745171___.

Name (Printed) Signature

WETLAND MITIGATION MICROTOPOGRAPHY
DESIGNATED SPECIALIST ACKNOWLEDGEMENT FORM

I HEREBY ACKNOWLEDGE, BASED ON VISUAL INSPECTION, THAT THE WETLAND MITIGATION SITE SHOWN ON THE PLANS HAS BEEN CONSTRUCTED WITH THE STATED MICROTOPOGRAPHY IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE CONTRACT NUMBER ____SM7745171___.

Name (Printed) Signature

Zone	Common Name	Botanical Name	Quantity
1			

Zone	Common Name	Botanical Name	Quantity
2			

Zone	Common Name	Botanical Name	Quantity
3			

Clay Channel Block	Northing	Easting	Station	Offset	Elevation
CCB 5-1					
CCB 5-2					
CCB 5-3					
CCB 5-4					
CCB 5-5					
CCB 5-6					
CCB 5-7					
CCB 5-8					
CCB 5-9					
CCB 5-10					
CCB 5-11					
CCB 5-12					
CCB 5-13					
CCB 5-14					
CCB 5-15					
CCB 6-1					

Rock Mix Channel Bed Material	Northing	Easting	Station	Offset	Elevation
WO 5-1					
WO 5-2					

Clay Trench	Northing	Easting	Station	Offset	Elevation
CT 6-1					
CT 6-2					
CT 6-3					
CT 6-4					

WETLAND MITIGATION SOIL AMENDMENT
DESIGNATED SPECIALIST ACKNOWLEDGEMENT FORM

I HEREBY ACKNOWLEDGE, BASED ON VISUAL INSPECTION, THAT THE WETLAND MITIGATION SITE SHOWN ON THE PLANS HAS BEEN CONSTRUCTED WITH THE STATED SOIL AMENDMENT IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE CONTRACT NUMBER ____SM7745171___.

Name (Printed) Signature

WETLAND MITIGATION MICROTOPOGRAPHY
DESIGNATED SPECIALIST ACKNOWLEDGEMENT FORM

I HEREBY ACKNOWLEDGE, BASED ON VISUAL INSPECTION, THAT THE WETLAND MITIGATION SITE SHOWN ON THE PLANS HAS BEEN CONSTRUCTED WITH THE STATED MICROTOPOGRAPHY IN ACCORDANCE WITH THE PLANS INCLUDED UNDER THE CONTRACT NUMBER ____SM7745171___.

Name (Printed) Signature

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com

WBCM

BY: arussell –

PLOTTED: 6/21/2022

R / W PLAT NUMBER

CROSS REFERENCE

ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-09
UTILITIES	NA

REVISIONS

3 GMP NO.3 09/30/2022

AS–BUILT TABLES

SCALE NTS ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. WT-09 OF 12

SHEET NO. 238 OF 260

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

100' 0 100' 200'
SCALE: 1" = 100'
DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com
WBCM

BY: oward –

PLOTTED: 8/15/2022

R / W PLAT NUMBER

CROSS REFERENCE	
ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-09
UTILITIES	NA

REVISIONS
3 GMP NO.3 09/30/2022

CROSS SECTION LOCATION PLAN SHEET

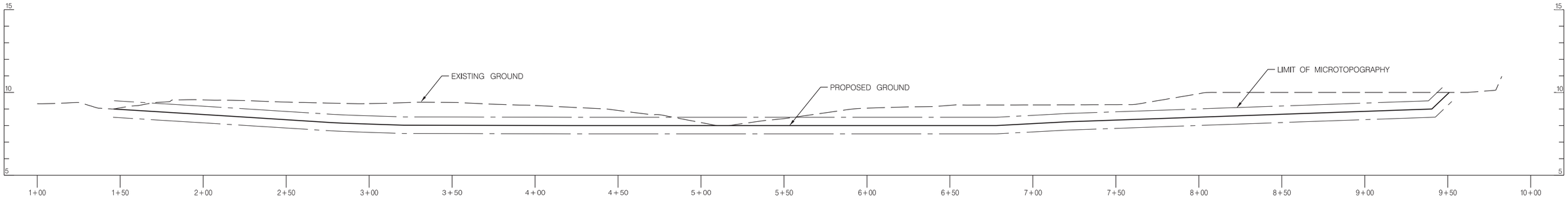
SCALE 1" = 100' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE 1" = 100'
VERTICAL SCALE N\A

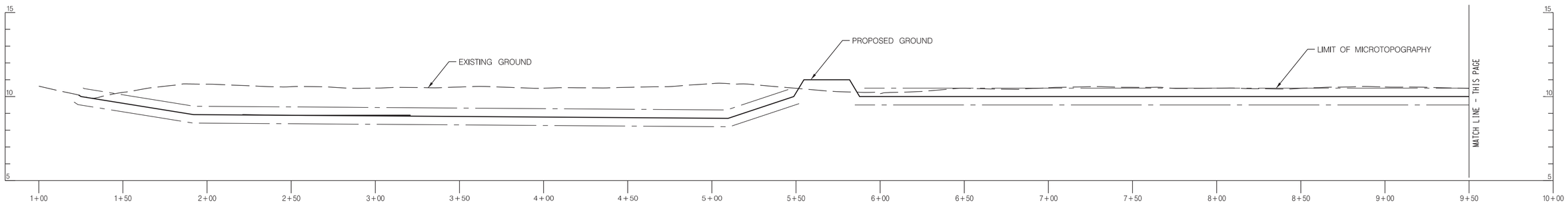
DRAWING NO. WT-10 OF 12

SHEET NO. 239 OF 260



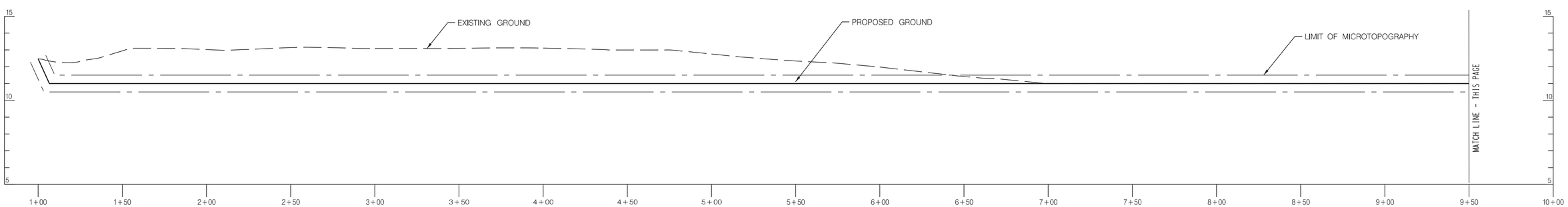
CONSTRUCTED WETLAND CROSS SECTION 01

HORIZ. SCALE: 1" = 30'
VERT. SCALE: 1" = 3'



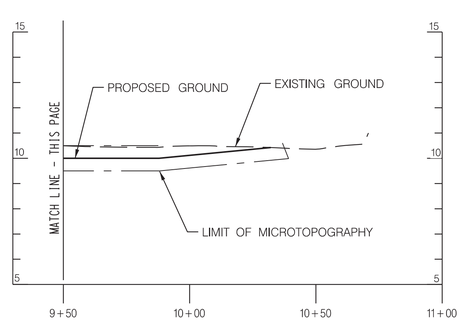
CONSTRUCTED WETLAND CROSS SECTION 02

HORIZ. SCALE: 1" = 30'
VERT. SCALE: 1" = 3'



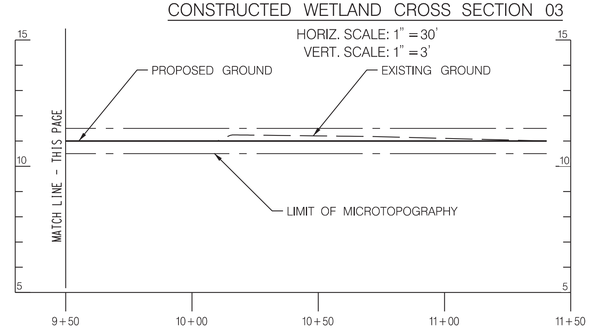
CONSTRUCTED WETLAND CROSS SECTION 03

HORIZ. SCALE: 1" = 30'
VERT. SCALE: 1" = 3'



CONSTRUCTED WETLAND CROSS SECTION 02 – CONT'D

HORIZ. SCALE: 1" = 30'
VERT. SCALE: 1" = 3'



CONSTRUCTED WETLAND CROSS SECTION 03 – CONT'D

HORIZ. SCALE: 1" = 30'
VERT. SCALE: 1" = 3'

NOTES: SEE SHEET WT–12

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com

WBCM

BY: arussell–

PLOTTED: 6/21/2022

CROSS REFERENCE

ITEM	SHEET NOs.
TYPICAL SHEETS	WT–10 TO WT–12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS–01
ROADWAY PLAN SHEETS	PS–19 TO PS–36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES–01 TO ES–08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD–01 TO LD–09
UTILITIES	NA

REVISIONS

3	GMP NO.3 09/30/2022

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WETLAND MITIGATION CROSS SECTIONS

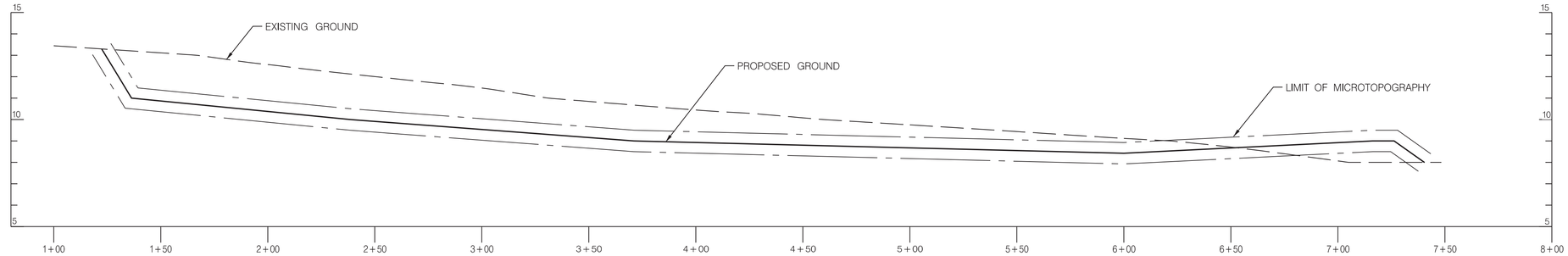
SCALE AS SHOWN ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16–PR–0050–03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE NTS
VERTICAL SCALE NTS

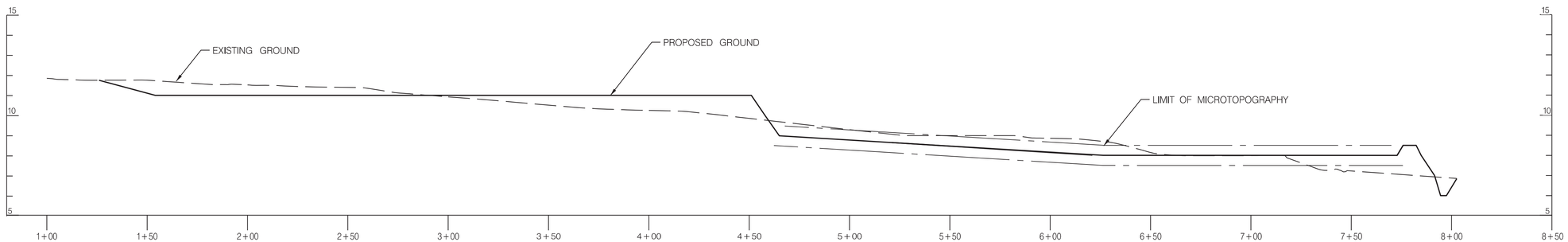
DRAWING NO. WT-11 OF 12

SHEET NO. 240 OF 260



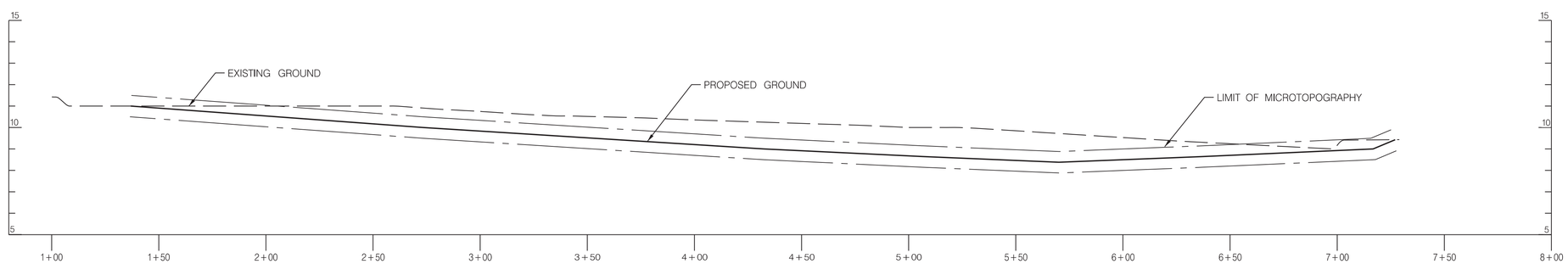
CONSTRUCTED WETLAND CROSS SECTION 04

HORIZ. SCALE: 1" = 30'
VERT. SCALE: 1" = 3'



CONSTRUCTED WETLAND CROSS SECTION 05

HORIZ. SCALE: 1" = 30'
VERT. SCALE: 1" = 3'



CONSTRUCTED WETLAND CROSS SECTION 06

HORIZ. SCALE: 1" = 30'
VERT. SCALE: 1" = 3'

NOTES:

1. CREATE THE FINAL SOIL SURFACE ROUGHNESS MOUNDS AND PITS VARYING FROM 6 INCHES ABOVE THE FINISHED GRADE TO 6 INCHES BELOW THE FINISHED GRADE.
2. THE MOUNDS SHALL HAVE A TOLERANCE +0.3 FEET AND THE PITS SHALL BE HAVE A TOLERANCE OF -0.3 FEET.
3. APPROXIMATELY 20% OF THE WETLAND SURFACE SHALL BE COMPROMISED OF RAISED MOUNDS AND APPROXIMATELY 30% OF THE WETLAND SURFACE SHALL BE COMPROMISED OF LOW PITS WITH THE REMAINING 50% BEING TRANSITIONAL WITH LESS THAN 20% AT THE PROPOSED GRADE.

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF HIGHWAY DESIGN

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

WHITNEY BAILEY COX & MAGNANI, LLC
300 East Joppa Road Suite 200
Baltimore, MD 21286
410.512.4500 www.wbcm.com

WBCM

R / W PLAT NUMBER

CROSS REFERENCE

ITEM	SHEET NOs.
TYPICAL SHEETS	WT-10 TO WT-12
SUPERELEVATION SHEETS	NA
PIPE & DRAINAGE SCHEDULE	NA
GEOMETRIC LAYOUT SHEETS	GS-01
ROADWAY PLAN SHEETS	PS-19 TO PS-36
ROADWAY PROFILE SHEETS	NA
TRAFFIC CONTROL SHEETS	NA
EROSION & SEDIMENT CONTROL	ES-01 TO ES-08
SIGNING & MARKING PLANS	NA
LANDSCAPE PLAN SHEETS	LD-01 TO LD-09
UTILITIES	NA

REVISIONS

3 GMP NO.3 09/30/2022

WETLAND MITIGATION CROSS SECTIONS

SCALE AS NOTED ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY ALN
CHECKED BY BN
MDE/PRD 16-PR-0050-03

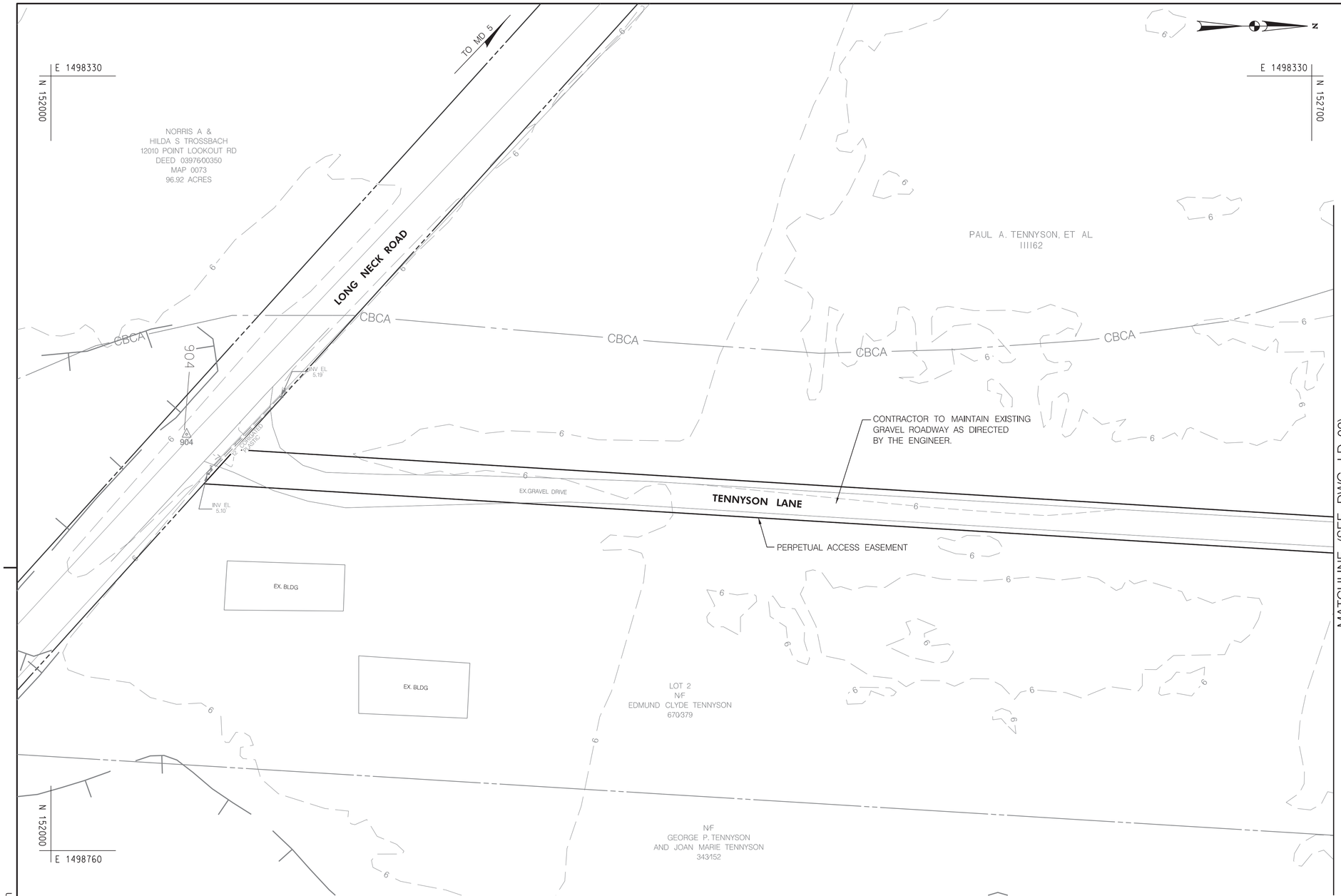
COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE NTS
VERTICAL SCALE NTS

DRAWING NO. WT-12 OF 12

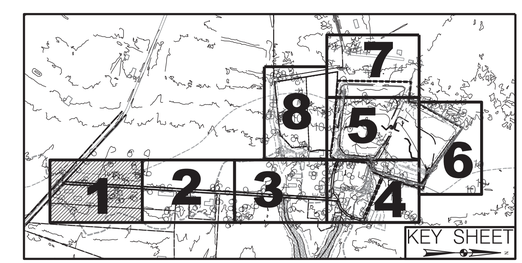
SHEET NO. 241 OF 260

BY: arussell –

PLOTTED: 6/21/2022



NO LANDSCAPING
ON THIS SHEET



30' 0 30' 60'
SCALE: 1" = 30'

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

BY: TConley – Landscape Programs Division

PLOTTED: 08/09/2022

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LANDSCAPE PROGRAMS DIVISION

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

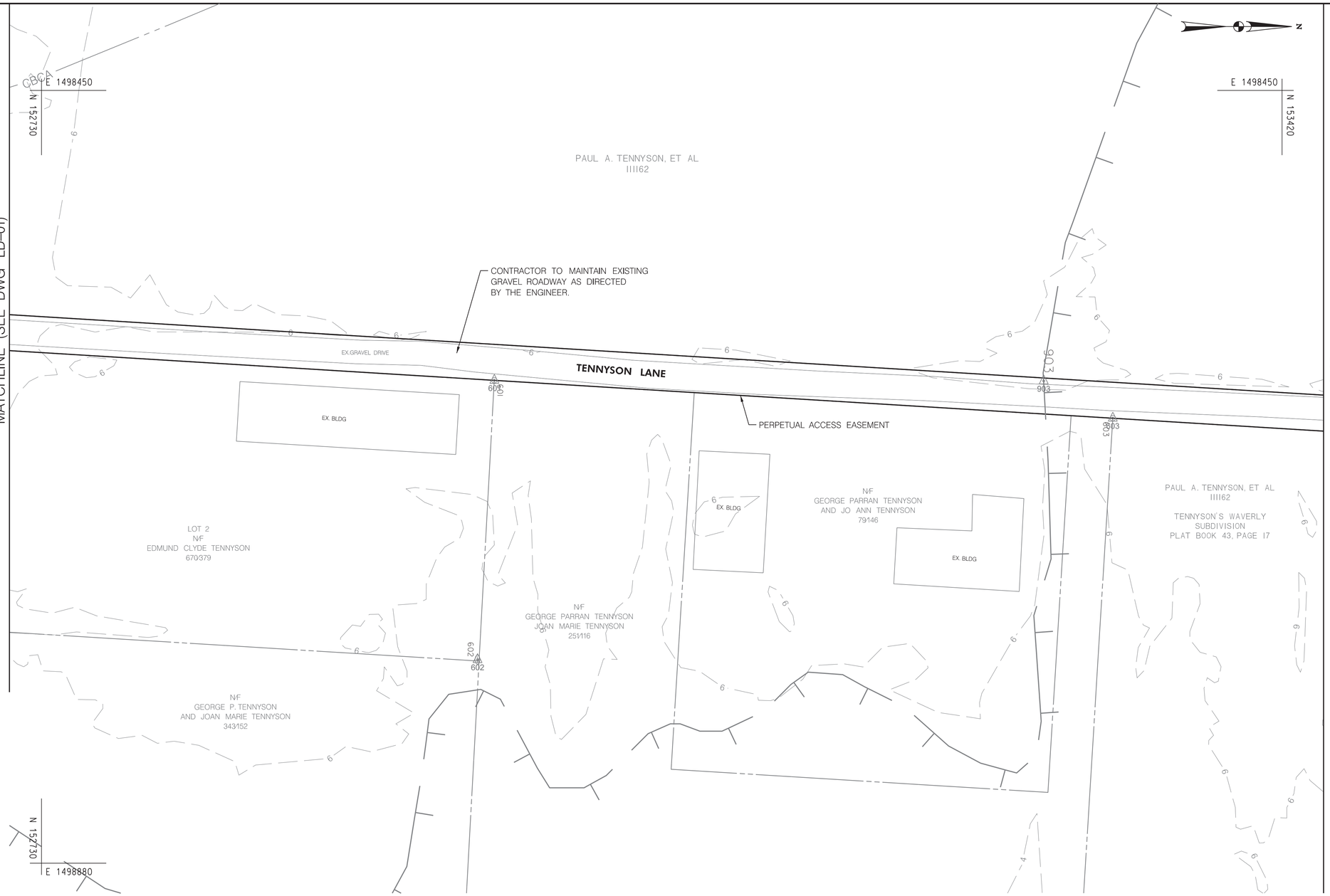
REVISIONS
3 GMP NO. 3 09/30/2022

LANDSCAPE PLAN SHEET

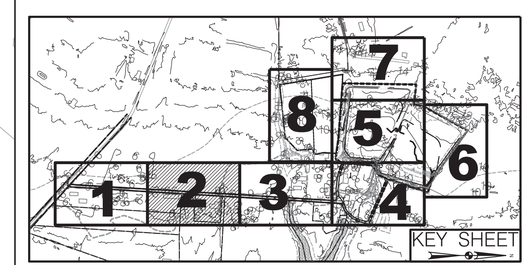
SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY TPC
CHECKED BY JRP
MDE/PRD 16-PR-0050-03
COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. LD-01 OF 09
SHEET NO. 252 OF 260



NO LANDSCAPING ON THIS SHEET



30' 0 30' 60'
SCALE: 1" = 30'

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

REVISIONS
3 GMP NO. 3 09/30/2022

LANDSCAPE PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY TPC
CHECKED BY JRP
MDE/PRD 16-PR-0050-03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. LD 02 09 SHEET NO. 253 OF 260

BY: TConley – Landscape Programs Division

PLOTTED: 08/09/2022

MATCHLINE (SEE DWG. LD–08)

MATCHLINE (SEE DWG LD–02)

MATCHLINE (SEE DWG. LD–04)

NO LANDSCAPING ON THIS SHEET

E 1498440
N 153460

E 1498440
N 154160

PAUL A. TENNYSON, ET AL
III162

PAUL A &
MARY ANN TENNYSON
TENNYSON LN
DEED 0302600247
MAP 0073
207.81 ACRES

EX. BLDG

CONTRACTOR TO MAINTAIN EXISTING GRAVEL ROADWAY AS DIRECTED BY THE ENGINEER.

INV EL 2.64
INV EL 1.53
INV EL 0.89
CMP

TENNYSON LANE

PERPETUAL ACCESS EASEMENT

EX.MTL BLDG

EX.GRAVEL DRIVE

CTR

INV EL 0.02

N/F
PAUL A. TENNYSON, ET AL
4609/374

PAUL A. TENNYSON, ET AL
III162

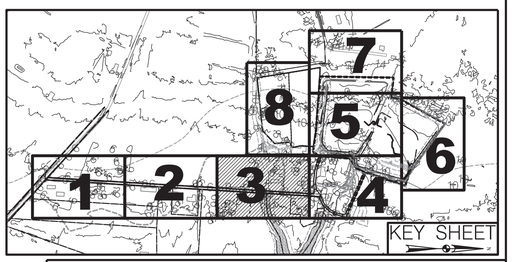
TENNYSON'S WAVERLY
SUBDIVISION
PLAT BOOK 43, PAGE 17

TIDAL WETLAND CONTINUES

N 153460
E 1498880

NOTE:
THIS SHEET IS ENTIRELY WITHIN THE CHESAPEAKE BAY CRITICAL AREA.

30' 0 30' 60'
SCALE: 1" = 30'



MDOT
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

LANDSCAPE PROGRAMS DIVISION

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

REVISIONS
3 GMP NO. 3 09/30/2022

LANDSCAPE PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY TPC
CHECKED BY JRP
MDE/PRD 16-PR-0050-03

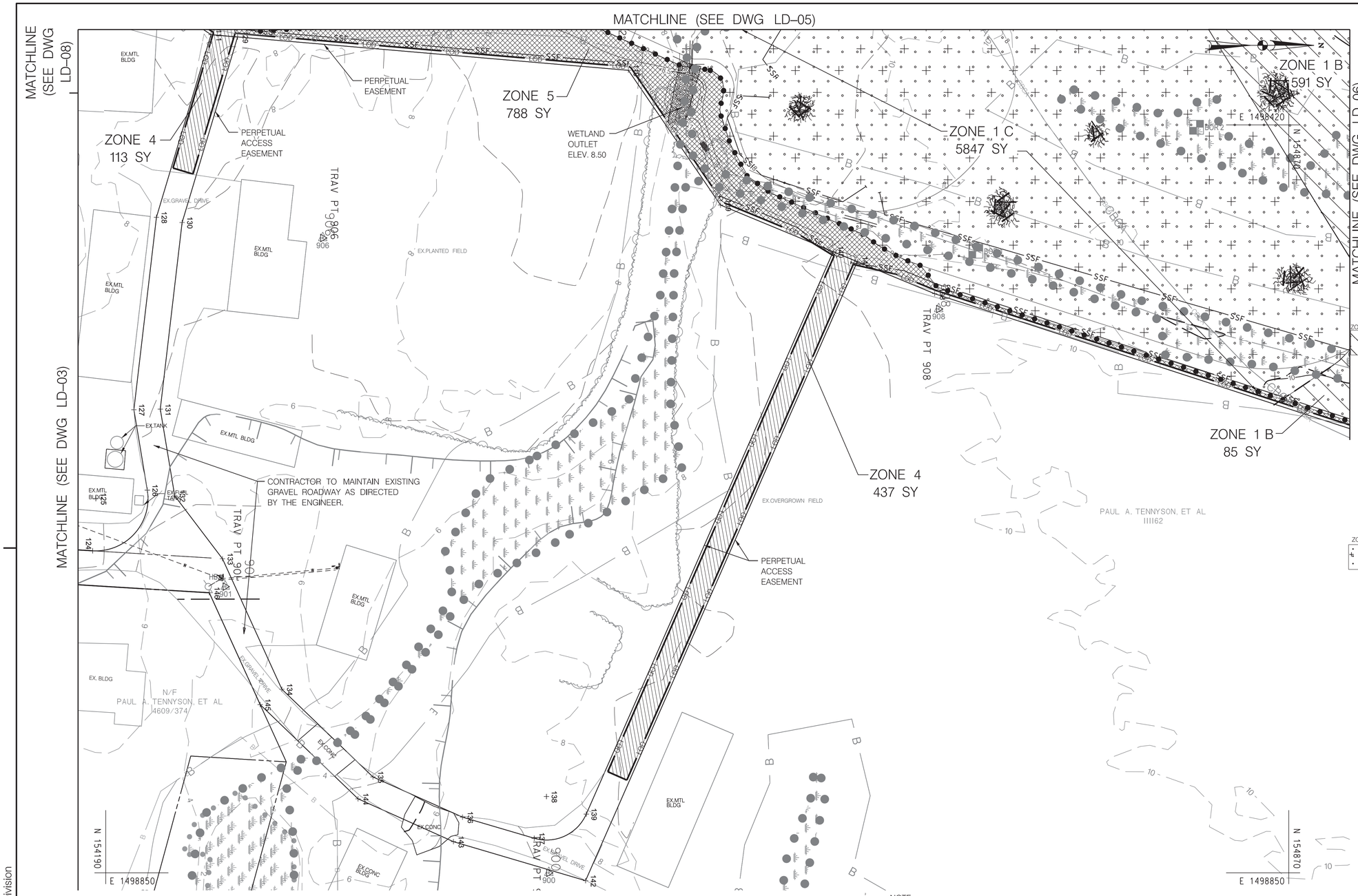
COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. LD-03 OF 09

SHEET NO. 254 OF 260

BY: TConley – Landscape Programs Division

PLOTTED: 08/09/2022



ZONES QUANTITIES (for this sheet only)

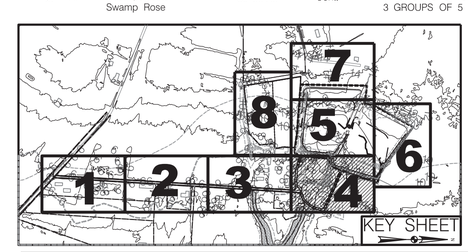
QUANTITY	SYMBOL	ZONE	ITEMS INCLUDED IN EACH ZONE
1A 0 SY 1B 676 SY 1C 5847 SY	ZONE 1A, ZONE 1B, ZONE 1C	ZONE 1 ZONE 1A ZONE 1B ZONE 1C	WETLAND TREE & SHRUB PLANTINGS 1. WET MEADOW ESTABLISHMENT 2. 6 IN. TENNYSON SITE SOIL 3. 2 IN. ORGANIC COMPOST TYPE B 4. TEMPORARY MULCH
0 SY		ZONE 2 ZONE 2A ZONE 2B	WETLAND TREE & SHRUB PLANTINGS 1. TENNYSON MEADOW ESTABLISHMENT 2. 6 IN. TENNYSON SITE SOIL 3. 2 IN. ORGANIC COMPOST TYPE B 4. TEMPORARY MULCH
0 SY		ZONE 3 SEE DWG LD–07	SCREENING BUFFER PLANTINGS 1. LOWLAND MEADOW ESTABLISHMENT 2. TEMPORARY MULCH 3. 4 IN. TENNYSON SITE SOIL
550 SY		ZONE 4	ACCESS ROAD 1. SHORT MEADOW ESTABLISHMENT 2. TEMPORARY MULCH
788 SY		ZONE 5	SIDE SLOPES FOR ACCESS ROAD 1. LOWLAND MEADOW ESTABLISHMENT 2. TEMPORARY MULCH 3. 4 IN. TENNYSON SITE SOIL

ZONE 1B PLANT SCHEDULE (for this sheet only)

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
6	BN	Betula nigra River Birch	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
10	MV	Magnolia virginiana Sweetbay Magnolia	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
15	NS	Nyssa sylvatica Blackgum, Sourgum	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
19	QB	Quercus bicolor Swamp White Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS – 8 GROUPS OF SHRUBS					
8	CO	Cephalanthus occidentalis Common Buttonbush	36 In. Ht.	Cont.	1 GROUP OF 2 2 GROUPS OF 3
6	CM	Cornus amomum Silky Dogwood	36 In. Ht.	Cont.	2 GROUP OF 3
8	SC	Sambucus canadensis Common Elderberry	36 In. Ht.	Cont.	1 GROUP OF 2 2 GROUPS OF 3

ZONE 1C PLANT SCHEDULE (for this sheet only)

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
84	QB	Quercus bicolor Swamp White Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
169	SN	Salix nigra Black Willow	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
169	TD	Taxodium distichum Bald Cypress	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS – 53 GROUPS OF SHRUBS					
66	CO	Cephalanthus occidentalis Common Buttonbush	36 In. Ht.	Cont.	12 GROUPS OF 3 6 GROUPS OF 5
66	IV	Itea virginica Virginia Sweetspire	36 In. Ht.	Cont.	12 GROUPS OF 3 6 GROUPS OF 5
57	RP	Rosa palustris Swamp Rose	36 In. Ht.	Cont.	14 GROUPS OF 3 3 GROUPS OF 5



NOTE:
1. NO FERTILIZER TO BE ADDED WITHIN THIS PROJECT.
2. INSTALL A TOTAL OF 42 WOODY DEBRIS PILES THROUGHOUT ZONE 1 AT THE DIRECTION OF THE DESIGNATED SPECIALIST
3. PLACE 1.5 OUNCES OF SOIL INOCULANT IN PLANTING PITS TO ENSURE CONTACT WITH TREE AND SHRUB ROOT SYSTEMS.

SPACE BETWEEN SHRUB GROUPS TO BE WITHIN A MAXIMUM OF 50 FEET FROM ONE ANOTHER. SHRUB GROUPINGS ARE A SUGGESTION AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS.

5 WOODY DEBRIS PILES (for this sheet only)

SIZE AND LOCATION SHOWN FOR WOODY DEBRIS PILES ARE FOR GRAPHIC PURPOSES ONLY

30' 0 30' 60'
SCALE: 1" = 30'

LEGEND

- PROPOSED EASEMENTS
- LOD — LIMIT OF DISTURBANCE
- 4 WIRE HIGH TENSILE ELECTRIC FENCE
- EXISTING WETLAND
- B — 25' WETLAND BUFFER
- PROPERTY LINE

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 5 (POINT LOOKOUT ROAD) FROM THE CAUSEWAY TO SOUTH OF CAMP BROWN ROAD TENNYSON WETLAND MITIGATION SITE

REVISIONS
3 GMP NO. 3 09/30/2022

LANDSCAPE PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY TPC
CHECKED BY JRP
MDE/PRD 16-PR-0050-03
COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE 1" = 30'
VERTICAL SCALE N\A

DRAWING NO. LD 04 09 SHEET NO. 255 OF 260

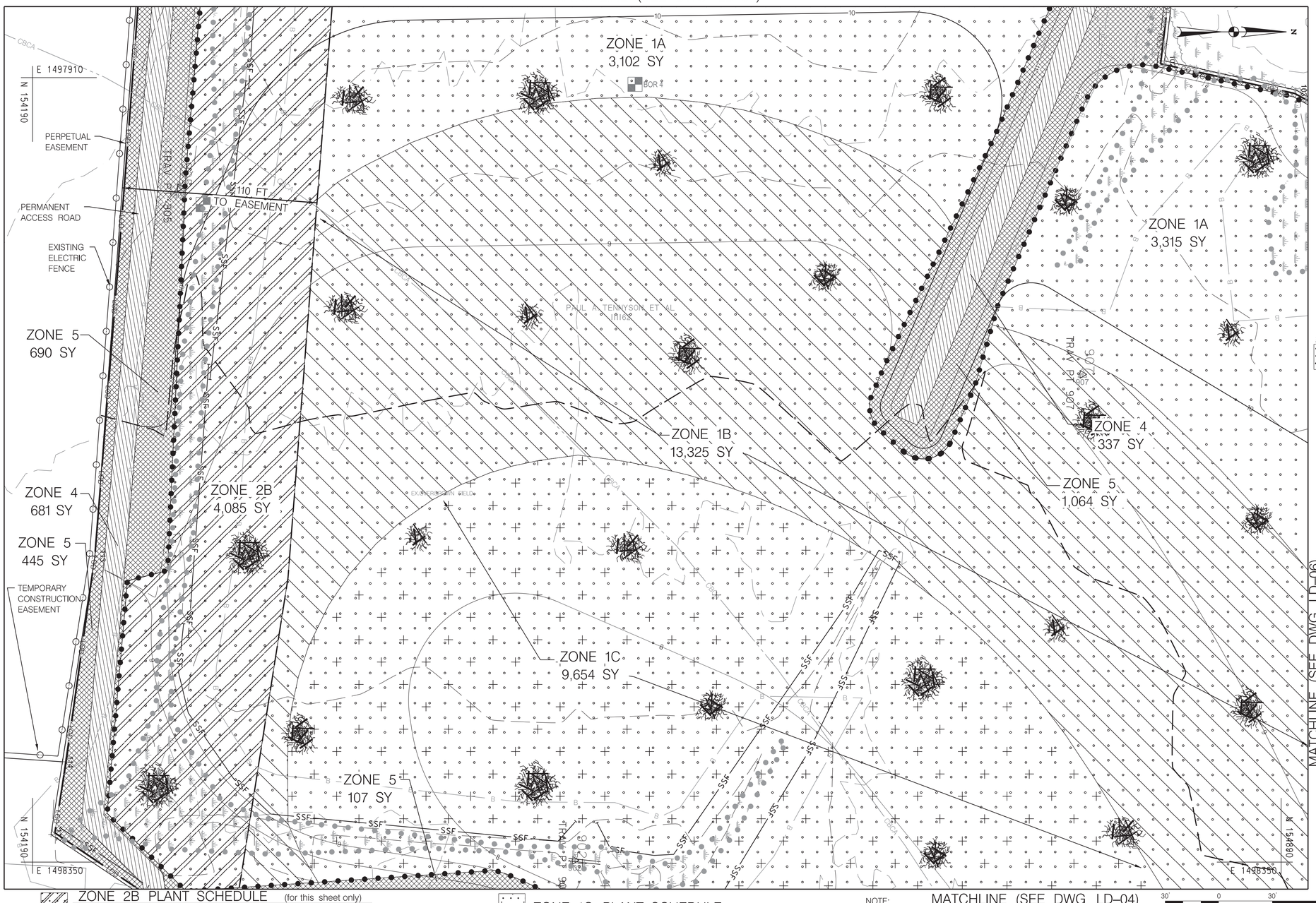
BY: tconley – Landscape Programs Division

PLOTTED: 08/10/2022

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03
Expiration Date: 7/6/2025

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

BY: TConley – Landscape Programs Division



ZONES QUANTITIES (for this sheet only)

QUANTITY	SYMBOL	ZONE	ITEMS INCLUDED IN EACH ZONE
1A 6,417 SY 1B 13,325 SY 1C 9,654 SY	ZONE 1A, ZONE 1B, ZONE 1C	ZONE 1 ZONE 1A ZONE 1B ZONE 1C	WETLAND TREE & SHRUB PLANTINGS 1. WET MEADOW ESTABLISHMENT 2. 6 IN. TENNYSON SITE SOIL 3. 2 IN. ORGANIC COMPOST TYPE B 4. TEMPORARY MULCH
2A 0 SY 2B 4,085 SY		ZONE 2 ZONE 2A ZONE 2B	WETLAND TREE & SHRUB PLANTINGS 1. TENNYSON MEADOW ESTABLISHMENT 2. 6 IN. TENNYSON SITE SOIL 3. 2 IN. ORGANIC COMPOST TYPE B 4. TEMPORARY MULCH
0 SY		ZONE 3 SEE DWG LD–07	SCREENING, BUFFER PLANTINGS 1. LOWLAND MEADOW ESTABLISHMENT 2. TEMPORARY MULCH 3. 4 IN. TENNYSON SITE SOIL
1,018 SY		ZONE 4	ACCESS ROAD 1. SHORT MEADOW ESTABLISHMENT 2. TEMPORARY MULCH
2,306 SY		ZONE 5	SIDE SLOPES FOR ACCESS ROAD 1. LOWLAND MEADOW ESTABLISHMENT 2. TEMPORARY MULCH 3. 4 IN. TENNYSON SITE SOIL

ZONE 1A PLANT SCHEDULE (for this sheet only)

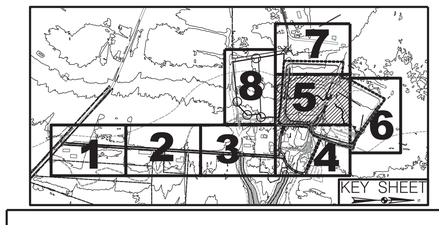
ZONE 1A

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
47	BN	Betula nigra River Birch	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
186	PO	Platanus occidentalis American Sycamore	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
93	QL	Quercus phellos Willow Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
140	QP	Quercus palustris Pin Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS –56 GROUPS OF SHRUBS					
73	BH	Baccharis hallmifolia Eastern Baccharis	36 In. Ht.	Cont.	11 GROUPS OF 3 8 GROUPS OF 5
62	CA	Clethra alnifolia Coastal Sweetpepper Bush	36 In. Ht.	Cont.	14 GROUPS OF 3 4 GROUPS OF 5
73	MP	Myrica pennsylvanica Northern Bayberry	36 In. Ht.	Cont.	11 GROUPS OF 3 8 GROUPS OF 5

ZONE 1B PLANT SCHEDULE (for this sheet only)

ZONE 1B

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
97	BN	Betula nigra River Birch	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
193	MV	Magnolia virginiana Sweetbay Magnolia	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
289	NS	Nyssa sylvatica Blackgum, Sourgum	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
386	QB	Quercus bicolor Swamp White Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS –116 GROUPS OF SHRUBS					
151	CO	Cephalanthus occidentalis Common Buttonbush	36 In. Ht.	Cont.	27 GROUPS OF 3 14 GROUPS OF 5
151	CM	Cornus amomum Silky Dogwood	36 In. Ht.	Cont.	27 GROUPS OF 3 14 GROUPS OF 5
130	SC	Sambucus canadensis Common Elderberry	36 In. Ht.	Cont.	20 GROUPS OF 3 14 GROUPS OF 5



ZONE 2B PLANT SCHEDULE (for this sheet only)

ZONE 2B

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
30	BN	Betula nigra River Birch	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
89	MV	Magnolia virginiana Sweetbay Magnolia	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
59	NS	Nyssa sylvatica Blackgum, Sourgum	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
119	QB	Quercus bicolor Swamp White Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS –56 GROUPS OF SHRUBS					
46	CO	Cephalanthus occidentalis Common Buttonbush	36 In. Ht.	Cont.	12 GROUPS OF 3 2 GROUPS OF 5
40	CM	Cornus amomum Silky Dogwood	36 In. Ht.	Cont.	10 GROUPS OF 3 2 GROUPS OF 5
46	SC	Sambucus canadensis Common Elderberry	36 In. Ht.	Cont.	12 GROUPS OF 3 2 GROUPS OF 5

ZONE 1C PLANT SCHEDULE (for this sheet only)

ZONE 1C

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
140	QB	Quercus bicolor Swamp White Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
280	SN	Salix nigra Black Willow	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
280	TD	Taxodium distichum Bald Cypress	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS –80 GROUPS OF SHRUBS					
108	CO	Cephalanthus occidentalis Common Buttonbush	36 In. Ht.	Cont.	16 GROUPS OF 3 12 GROUPS OF 5
108	IV	Itea virginica Virginia Sweetspire	36 In. Ht.	Cont.	16 GROUPS OF 3 12 GROUPS OF 5
92	RP	Rosa palustris Swamp Rose	36 In. Ht.	Cont.	14 GROUPS OF 3 10 GROUPS OF 5

NOTE:

1. NO FERTILIZER TO BE ADDED WITHIN THIS PROJECT.
2. INSTALL A TOTAL OF 42 WOODY DEBRIS PILES THROUGHOUT ZONE 1 AT THE DIRECTION OF THE DESIGNATED SPECIALIST
3. PLACE 1.5 OUNCES OF SOIL INOCULANT IN PLANTING PITS TO ENSURE CONTACT WITH TREE AND SHRUB ROOT SYSTEMS

SPACE BETWEEN SHRUB GROUPS TO BE WITHIN A MAXIMUM OF 50 FEET FROM ONE ANOTHER.
SHRUB GROUPINGS ARE A SUGGESTION AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS.

25 WOODY DEBRIS PILES (for this sheet only)

SIZE AND LOCATION SHOWN FOR WOODY DEBRIS PILES ARE FOR GRAPHIC PURPOSES ONLY

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

REVISIONS
3 GMP NO. 3 09/30/2022

LANDSCAPE PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY TPC
CHECKED BY JRP
MDE/PRD 16–PR–0050–03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. LD 05 09 SHEET NO. 256 OF 260

PLOTTED: 08/09/2022

MATCHLINE (SEE DWG LD–05)

MATCHLINE (SEE DWG LD–04)

ZONES QUANTITIES (for this sheet only)

QUANTITY	SYMBOL	ZONE	ITEMS INCLUDED IN EACH ZONE
1A 8,510 SY 1B 2,814 SY 1C 34 SY	ZONE 1A, ZONE 1B, ZONE 1C	ZONE 1 ZONE 1A ZONE 1B ZONE 1C	WETLAND TREE & SHRUB PLANTINGS 1. WET MEADOW ESTABLISHMENT 2. 6 IN. TENNYSON SITE SOIL 3. 2 IN. ORGANIC COMPOST TYPE B 4. TEMPORARY MULCH
0 SY		ZONE 2 ZONE 2A ZONE 2B	WETLAND TREE & SHRUB PLANTINGS 1. TENNYSON MEADOW ESTABLISHMENT 2. 6 IN. TENNYSON SITE SOIL 3. 2 IN. ORGANIC COMPOST TYPE B 4. TEMPORARY MULCH
0 SY		ZONE 3 SEE DWG LD–07	SCREENING BUFFER PLANTINGS 1. LOWLAND MEADOW ESTABLISHMENT 2. TEMPORARY MULCH 3. 4 IN. TENNYSON SITE SOIL
0 SY		ZONE 4	ACCESS ROAD 1. SHORT MEADOW ESTABLISHMENT 2. TEMPORARY MULCH
1441 SY		ZONE 5	SIDE SLOPES FOR ACCESS ROAD 1. LOWLAND MEADOW ESTABLISHMENT 2. TEMPORARY MULCH 3. 4 IN. TENNYSON SITE SOIL

ZONE 1A

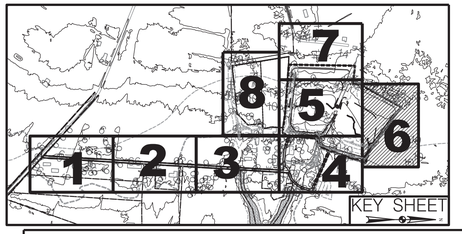
ZONE 1A PLANT SCHEDULE (for this sheet only)

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
62	BN	Betula nigra River Birch	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
247	PO	Platanus occidentalis American Sycamore	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
123	QL	Quercus phellos Willow Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
185	QP	Quercus palustris Pin Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS – 79 GROUPS OF SHRUBS					
97	BH	Baccharis halimifolia Eastern Baccharis	36 In. Ht.	Cont.	19 GROUPS OF 3 8 GROUPS OF 5
83	CA	Clethra alnifolia Coastal Sweetpepper Bush	36 In. Ht.	Cont.	21 GROUPS OF 3 4 GROUPS OF 5
97	MP	Myrica pennsylvanica Northern Bayberry	36 In. Ht.	Cont.	19 GROUPS OF 3 8 GROUPS OF 5

ZONE 1B

ZONE 1B PLANT SCHEDULE (for this sheet only)

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
20	BN	Betula nigra River Birch	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
41	MV	Magnolia virginiana Sweetbay Magnolia	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
61	NS	Nyssa sylvatica Blackgum, Sourgum	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
82	QB	Quercus bicolor Swamp White Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS – 25 GROUPS OF SHRUBS					
33	CO	Cephalanthus occidentalis Common Buttonbush	36 In. Ht.	Cont.	6 GROUPS OF 3 3 GROUPS OF 5
27	CM	Cornus amomum Silky Dogwood	36 In. Ht.	Cont.	4 GROUPS OF 3 3 GROUPS OF 5
33	SC	Sambucus canadensis Common Elderberry	36 In. Ht.	Cont.	6 GROUPS OF 3 3 GROUPS OF 5



LEGEND

- PROPOSED EASEMENTS
- LOD — LIMIT OF DISTURBANCE
- 4 WIRE HIGH TENSILE ELECTRIC FENCE
- EXISTING WETLAND
- B — 25' WETLAND BUFFER
- PROPERTY LINE

ZONE 1C

ZONE 1C PLANT SCHEDULE (for this sheet only)

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
0	QB	Quercus bicolor Swamp White Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
1	SN	Salix nigra Black Willow	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
2	TD	Taxodium distichum Bald Cypress	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS – 1 GROUP OF SHRUBS					
0	CO	Cephalanthus occidentalis Common Buttonbush	36 In. Ht.	Cont.	
3	IV	Itea virginica Virginia Sweetspire	36 In. Ht.	Cont.	1 GROUP OF 3
0	RP	Rosa palustris Swamp Rose	36 In. Ht.	Cont.	

NOTE:

1. NO FERTILIZER TO BE ADDED WITHIN THIS PROJECT.
2. INSTALL A TOTAL OF 42 WOODY DEBRIS PILES THROUGHOUT ZONE 1 AT THE DIRECTION OF THE DESIGNATED SPECIALIST
3. PLACE 1.5 OUNCES OF SOIL INOCULANT IN PLANTING PITS TO ENSURE CONTACT WITH TREE AND SHRUB ROOT SYSTEMS.

SPACE BETWEEN SHRUB GROUPS TO BE WITHIN A MAXIMUM OF 50 FEET FROM ONE ANOTHER. SHRUB GROUPINGS ARE A SUGGESTION AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS.

8 WOODY DEBRIS PILES (for this sheet only)

SIZE AND LOCATION SHOWN FOR WOODY DEBRIS PILES ARE FOR GRAPHIC PURPOSES ONLY

30' 0 30' 60'
SCALE: 1" = 30'

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

REVISIONS
3 GMP NO. 3 09/30/2022

LANDSCAPE PLAN SHEET

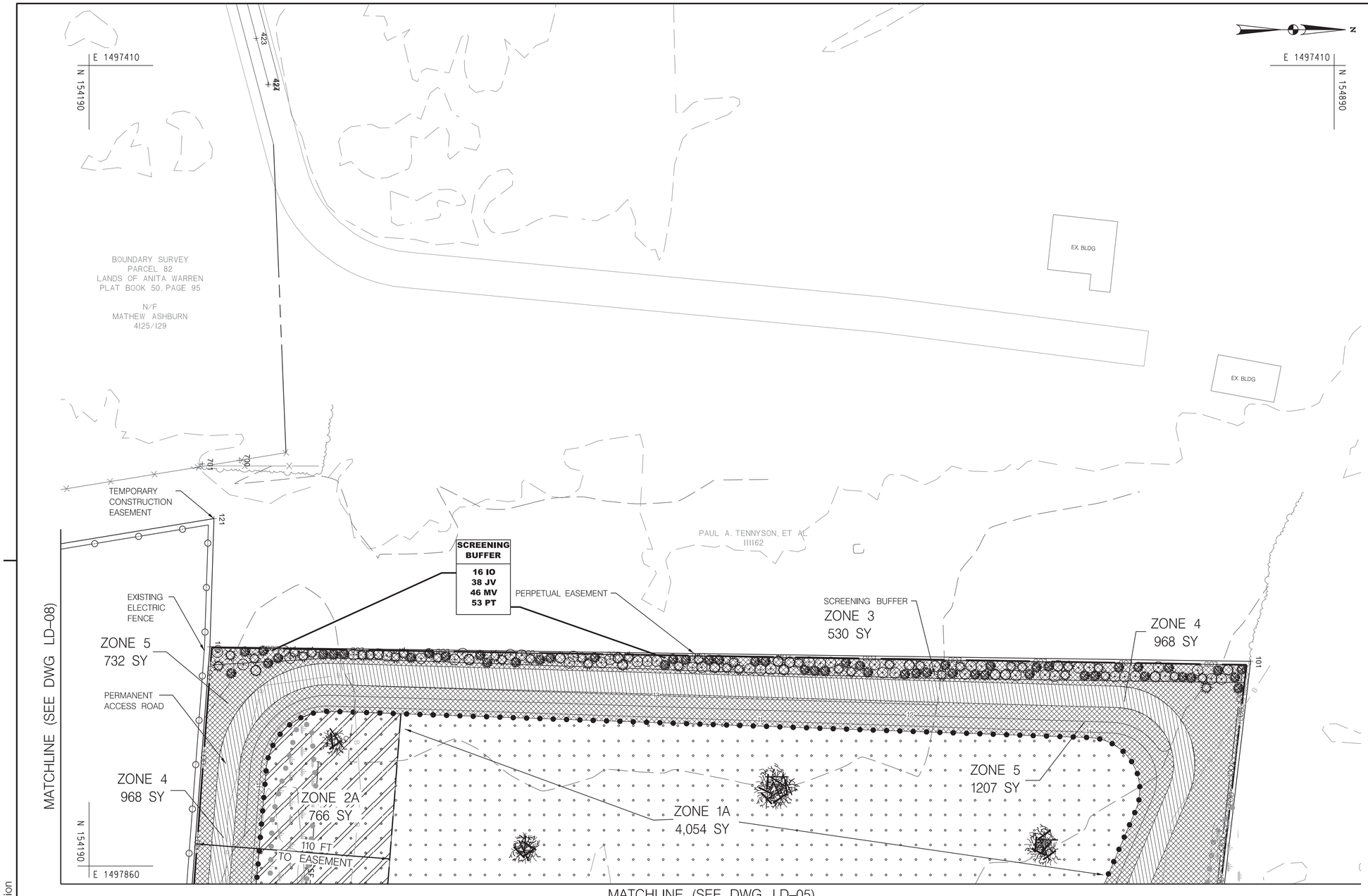
SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY TPC
CHECKED BY JRP
MDE/PRD 16–PR–0050–03
COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE 1" = 30'
VERTICAL SCALE N\A

DRAWING NO. LD 06 09
SHEET NO. 257 OF 260

BY: TConley – Landscape Programs Division

PLOTTED: 08/09/2022



ZONES QUANTITIES (for this sheet only)

QUANTITY	SYMBOL	ZONE	ITEMS INCLUDED IN EACH ZONE
1A 4,054 SY 1B 0 SY 1C 0 SY	ZONE 1A, ZONE 1B, ZONE 1C	ZONE 1 ZONE 1A ZONE 1B ZONE 1C	WETLAND TREE & SHRUB PLANTINGS 1. WET MEADOW ESTABLISHMENT 2. 6 IN. TENNYSON SITE SOIL 3. 2 IN. ORGANIC COMPOST TYPE B 4. TEMPORARY MULCH
2A 766 SY 2B 0 SY		ZONE 2 ZONE 2A ZONE 2B	WETLAND TREE & SHRUB PLANTINGS 1. TENNYSON MEADOW ESTABLISHMENT 2. 6 IN. TENNYSON SITE SOIL 3. 2 IN. ORGANIC COMPOST TYPE B 4. TEMPORARY MULCH
530 SY		ZONE 3 SEE DWG	(See Screening Buffer Plant Schedule below) SCREENING BUFFER PLANTINGS 1. LOWLAND MEADOW ESTABLISHMENT 2. TEMPORARY MULCH 3. 4 IN. TENNYSON SITE SOIL
968 SY		ZONE 4	ACCESS ROAD 1. SHORT MEADOW ESTABLISHMENT 2. TEMPORARY MULCH
1939 SY		ZONE 5	SIDE SLOPES FOR ACCESS ROAD 1. LOWLAND MEADOW ESTABLISHMENT 2. TEMPORARY MULCH 3. 4 IN. TENNYSON SITE SOIL

ZONE 1A PLANT SCHEDULE (for this sheet only)

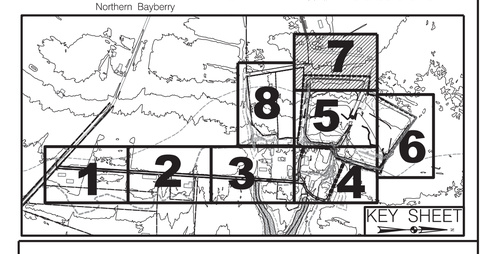
ZONE 1A

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
29	BN	Betula nigra River Birch	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
118	PO	Platanus occidentalis American Sycamore	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
59	QL	Quercus phellos Willow Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
88	QP	Quercus palustris Pin Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS - 32 GROUPS OF SHRUBS					
45	BH	Baccharis halimifolia Eastern Baccharis	36 In. Ht.	Cont.	10 GROUPS OF 3 3 GROUPS OF 5
41	CA	Clethra alnifolia Coastal Sweetpepper Bush	36 In. Ht.	Cont.	7 GROUPS OF 3 4 GROUPS OF 5
45	MP	Myrica pennsylvanica Northern Bayberry	36 In. Ht.	Cont.	10 GROUPS OF 3 3 GROUPS OF 5

ZONE 2A PLANT SCHEDULE (for this sheet only)

ZONE 2A

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
6	BN	Betula nigra River Birch	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
22	PO	Platanus occidentalis American Sycamore	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
11	QL	Quercus phellos Willow Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
17	QP	Quercus palustris Pin Oak	7 Ft. Ht.	# 10 Cont.	~12 Ft. O.C.
SHRUBS - 8 GROUPS OF SHRUBS					
9	BH	Baccharis halimifolia Eastern Baccharis	36 In. Ht.	Cont.	3 GROUPS OF 3
6	CA	Clethra alnifolia Coastal Sweetpepper Bush	36 In. Ht.	Cont.	2 GROUPS OF 3
9	MP	Myrica pennsylvanica Northern Bayberry	36 In. Ht.	Cont.	3 GROUPS OF 3



LEGEND

- PROPOSED EASEMENTS
- LOD — LIMIT OF DISTURBANCE
- 4 WIRE HIGH TENSILE ELECTRIC FENCE
- EXISTING WETLAND
- B — 25' WETLAND BUFFER
- PROPERTY LINE

NOTE:

1. NO FERTILIZER TO BE ADDED WITHIN THIS PROJECT.
2. INSTALL A TOTAL OF 42 WOODY DEBRIS PILES THROUGHOUT ZONE 1 AT THE DIRECTION OF THE DESIGNATED SPECIALIST.
3. PLACE 1.5 OUNCES OF SOIL INOCULANT IN PLANTING PITS TO ENSURE CONTACT WITH TREE AND SHRUB ROOT SYSTEMS.

SPACE BETWEEN SHRUB GROUPS TO BE WITHIN A MAXIMUM OF 50 FEET FROM ONE ANOTHER. SHRUB GROUPINGS ARE A SUGGESTION AND CAN BE ADJUSTED TO ACCOMMODATE FIELD CONDITIONS.

4 WOODY DEBRIS PILES (for this sheet only)

SIZE AND LOCATION SHOWN FOR WOODY DEBRIS PILES ARE FOR GRAPHIC PURPOSES ONLY

SCREENING BUFFER PLANT SCHEDULE

QTY	CODE	BOTANICAL NAME/COMMON NAME	SIZE	CONDITION	REMARKS
TREES					
16	IO	Ilex opaca American Holly	7 Ft. Ht.	# 10 Cont.	~5 Ft. O.C. 3 Males spaced apart
38	JV	Juniperus virginiana Eastern Red Cedar	7 Ft. Ht.	# 10 Cont.	~5 Ft. O.C.
46	MV	Magnolia virginiana Sweetbay Magnolia	7 Ft. Ht.	# 10 Cont.	Plant on mounds ~5 Ft. O.C.
53	PT	Pinus taeda Loblolly Pine	7 Ft. Ht.	# 10 Cont.	~5 Ft. O.C.

SPACE BETWEEN BUFFER PLANTS TO A MAXIMUM OF 9 FEET AND A MINIMUM OF 4 FEET – AVERAGING ABOUT 5 FEET APART. GROUP BUFFER PLANTS IN 3'S TYPICALLY – SOMETIMES SINGLES AND OCCASIONALLY DOUBLES OF THE SAME SPECIES. OKAY TO PLANT AT CORNERS ON BOTH ENDS.

30' 0 30' 60'
SCALE: 1" = 30'

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
FINAL APPROVAL
7/6/2022
Chief, Plan Review Division
PRD No. 16-PR-0050-03

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
PRD No. 16-PR-0050-03 Expiration Date: 7/6/2025

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
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TENNYSON WETLAND MITIGATION SITE

REVISIONS
3 GMP NO. 3 09/30/2022

LANDSCAPE PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY TPC
CHECKED BY JRP
MDE/PRD 16-PR-0050-03
COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE 1" = 30'
VERTICAL SCALE N\A

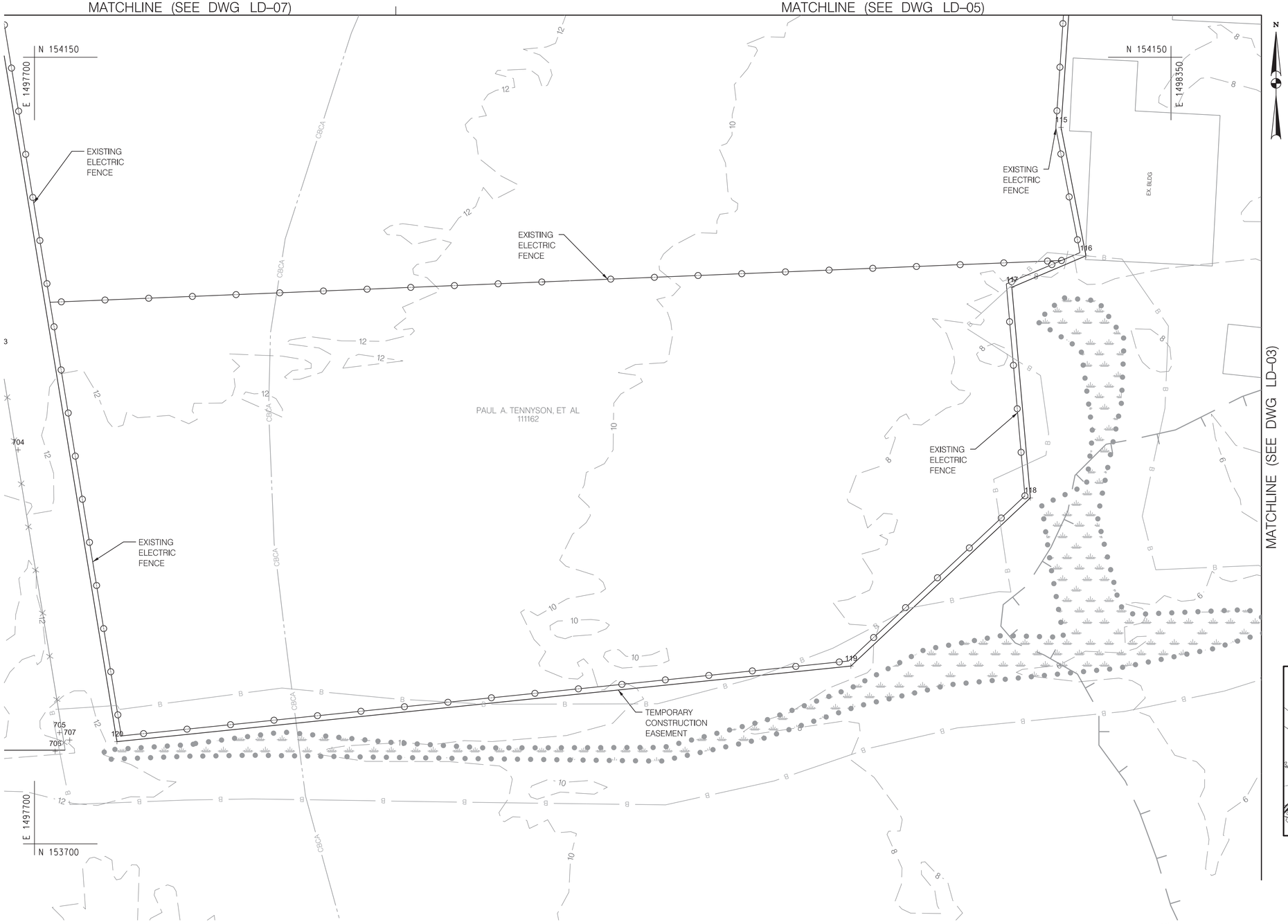
DRAWING NO. LD 07 09
SHEET NO. 258 OF 260

BY: TConley – Landscape Programs Division

PLOTTED: 08/09/2022

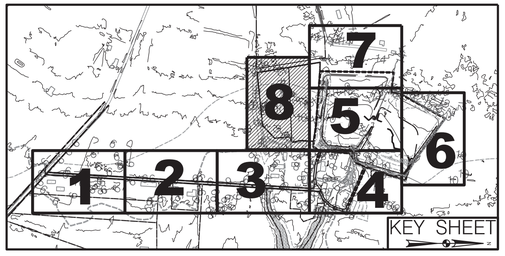
MATCHLINE (SEE DWG LD–07)

MATCHLINE (SEE DWG LD–05)



MATCHLINE (SEE DWG LD–03)

NO LANDSCAPING ON THIS SHEET



30' 0 30' 60'

SCALE: 1" = 30'

MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
MODIFICATION 1 APPROVAL
08/30/2022
Deputy Director, Office of Highway Development
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MDOT SHA STORMWATER MANAGEMENT & SEDIMENT CONTROL
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MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

REVISIONS

3 GMP NO. 3 09/30/2022

LANDSCAPE PLAN SHEET

SCALE 1" = 30' ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY TPC
CHECKED BY JRP
MDE/PRD 16-PR-0050-03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE 1" = 30'
VERTICAL SCALE N\A

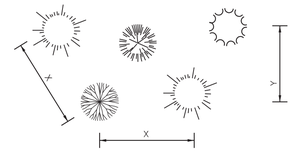
DRAWING NO. LD 08 09

SHEET NO. 259 OF 260

BY: TConley – Landscape Programs Division

PLOTTED: 08/09/2022

Zone 1 & 2 - Wetland Plantings						
Quantity	Code	Botanical Name	Common Name	Size	Type	Notes
		Trees				
297	BN	*Betula nigra*	River Birch	7 Ft. Ht.	#10 Cont. / B&B	~12 Ft. O.C.
333	MV	*Magnolia virginiana*	Sweetbay	7 Ft. Ht.	#10 Cont. / B&B	~12 Ft. O.C.
424	NS	*Nyssa sylvatica*	Blackgum	1 In. Cal.	#10 Cont. / B&B	~12 Ft. O.C.
573	PO	*Platanus occidentalis*	American Sycamore	1 In. Cal.	#10 Cont. / B&B	~12 Ft. O.C.
830	QB	*Quercus bicolor*	Swamp White Oak	1 In. Cal.	#10 Cont. / B&B	~12 Ft. O.C.
286	QL	*Quercus phellos*	Willow Oak	1 In. Cal.	#10 Cont. / B&B	~12 Ft. O.C.
430	QP	*Quercus palustris*	Pin Oak	1 In. Cal.	#10 Cont. / B&B	~12 Ft. O.C.
450	SN	*Salix nigra*	Black Willow	1 In. Cal.	#10 Cont. / B&B	~12 Ft. O.C.
451	TD	*Taxodium distichum*	Bald Cypress	7 Ft. Ht.	#10 Cont. / B&B	~12 Ft. O.C.
4074		Total				
		Shrubs				
224	BH	*Baccharis halimifolia*	Eastern Baccharis	36 In. Ht.	Container Grown	Naturalized in groups of 3 or 5. See Plant Schedule for each sheet for groupings
412	CO	*Cephalanthus occidentalis*	Common Buttonbush	36 In. Ht.	Container Grown	
192	CA	*Ciethra alnifolia*	Coastal Sweetpepperbush	36 In. Ht.	Container Grown	
224	CM	*Cornus amomum*	Silky Dogwood	36 In. Ht.	Container Grown	
177	IV	*itea virginica*	Virginia Sweetspire	36 In. Ht.	Container Grown	
224	MP	*Myrica pensylvanica*	Northern Bayberry	36 In. Ht.	Container Grown	
149	RP	*Rosa palustris*	Swamp Rose	36 In. Ht.	Container Grown	
217	SC	*Sambucus canadensis*	American Black Elderberry	36 In. Ht.	Container Grown	
1819		Total				



Naturalized Plant Spacing		
Spacing	X (Ft.)	Y (Ft.)
Average	5	5
Maximum	9	9
Minimum	4	4

NATURAL PLANT SPACING DETAIL

N.T.S.

Zone 3 - Screening Buffer							
Quantity	Code	Botanical Name	Common Name	Wetland Indicator Status	Size	Type	Spacing
		Evergreen Trees					
16	IO	*Ilex opaca*	American Holly	FAC	7 Ft. Ht.	#10 Cont. / B&B	Naturalized @ ~5 feet on center
38	JV	*Juniperus virginiana*	Eastern Red Cedar	FACU	7 Ft. Ht.	#10 Cont. / B&B	Naturalized @ ~5 feet on center
46	MV	*Magnolia virginiana*	Sweetbay	FACW	7 Ft. Ht.	#10 Cont. / B&B	Naturalized @ ~5 feet on center
53	PT	*Pinus taeda L.*	Loblolly Pine	FAC	7 Ft. Ht.	#10 Cont. / B&B	Naturalized @ ~5 feet on center
153	Total						

Yielding Posts		
Quantity	Item	Location
32	*7 Ft. Yielding Posts*	See Specification

Totals for Seed, Soil, & Mulch				
Quantity	Item	Zone	Type	Spacing
51,331 SY	Wet Meadow Establishment	Zone 1	Seed	See Specification
4,851 SY	Tennyson Meadow Establishment	Zone 2	Seed	See Specification
7,004 SY	Lowland Meadow Establishment	Zone 3 & 5	Seed	See Specification
2,536 SY	Short Meadow Establishment	Zone 4	Seed	See Specification
56,182 SY	6 Inch Tennyson Site Soil	Zone 1 & 2	Soil	See Specification
7,004 SY	4 Inch Tennyson Site Soil	Zone 3 & 5	Soil	See Specification
56,182 SY	2 Inch Oranic Compost Type B	Zone 1 & 2	Compost	See Specification
65,222 SY	Temporary Mulch	Zone 1, 2, 3, 4, 5	Mulch	See Specification
42	Woody Debris Piles	Zone 1 &2	Debris	See Specification

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 5 (POINT LOOKOUT ROAD)
FROM THE CAUSEWAY TO SOUTH
OF CAMP BROWN ROAD
TENNYSON WETLAND MITIGATION SITE

REVISIONS

3 GMP NO. 3 09/30/2022

LANDSCAPING SCHEDULES

SCALE NTS ADVERTISED DATE – CONTRACT NO. SM7745171B

DESIGNED BY MH
DRAWN BY TPC
CHECKED BY JRP
MDE/PRD 16-PR-0050-03

COUNTY ST. MARYS
LOGMILE
HORIZONTAL SCALE
VERTICAL SCALE

DRAWING NO. LD 09 09

SHEET NO. 260 OF 260

BY: TConley – Landscape Programs Division

PLOTTED: 08/09/2022

APPENDIX F

TENNYSON LEDGER

Tennyson Wetland Mitigation Bank

Type	Jurisdiction	Date	Permitee	Credits	Permits	Credit Classification	Impact HUC	Impact Quantity	TW	Available Credits	Comment
Release	Federal	Pending	SHA			PFO - Palustrine Forested (AC)					15% upon MBI execution by IRT
Release	Federal	Pending	SHA			PFO - Palustrine Forested (AC)					15% upon completion of As-Builts
Release	Federal	Pending	SHA			PFO - Palustrine Forested (AC)					20% upon atainment of year 2 performance standards
Release	Federal	Pending	SHA			PFO - Palustrine Forested (AC)					10% upon atainment of year 3 performance standards
Release	Federal	Pending	SHA			PFO - Palustrine Forested (AC)					15% upon atainment of year 5 performance standards
Release	Federal	Pending	SHA			PFO - Palustrine Forested (AC)					10% upon atainment of year 7 performance standards
Release	Federal	Pending	SHA			PFO - Palustrine Forested (AC)					15% upon atainment of year 10 performance standards

APPENDIX G

TENNYSON LONG-TERM MANAGEMENT PLAN

MARYLAND STATE HIGHWAY ADMINISTRATION LONG-TERM MANAGEMENT PLAN
TENNYSON MITIGATION SITE

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Long-Term Management Plan

I Introduction

A Purpose of Establishment

Mitigation is established to compensate for unavoidable impacts to, and to conserve and to protect waters of the U.S. This Long-term Management Plan (LTMP) is developed to protect and ensure the integrity of the mitigation as required by the 2008 Federal Mitigation Rule (33 CRF 332).

B Purpose of this Long-term Management Plan

The purpose of this LTMP is to ensure the Tennyson Mitigation Site is managed, monitored, and maintained in perpetuity. This management plan establishes objectives, priorities and tasks to monitor, manage, maintain and report on the waters of the U.S., covered species and covered habitat on the site after Performance Standards established for the site have been achieved.

C Long Term Steward and Responsibilities

The Long-Term Steward for the Tennyson Mitigation Site is the Maryland State Highway Administration (SHA). The Long-Term Steward, and subsequent Long-Term Stewards upon transfer, shall implement this long-term management plan, managing and monitoring the mitigation property in perpetuity to preserve its habitat and conservation values. Long-term management tasks shall be funded through the SHA Environmental Preservation Fund. The Long-Term Steward will maintain a copy of the Long-term Management Plan and all addendums associated with the Tennyson Site including all deed restrictions and/or easements. Any subsequent grading, or alteration of the site's hydrology and/or topography by the Long-Term Steward or its representatives must be approved by the U.S. Army Corps of Engineers (COE) and the Maryland Department of the Environment (MDE), i.e., "regulatory agencies" and the necessary permits, such as a Section 404 permit and/or Maryland Nontidal Wetlands Permit, must be obtained if required.

D Eminent Domain

If the site is taken in whole or in part through eminent domain, the Long-Term Steward shall use all monies received as compensation for lands and all associated services and values taken to provide replacement compensation within the same service area subject to COE and MDE approval. The COE and MDE shall have the right to participate in any proceeding associated with the determination of the amount of such compensation. Replacement compensation may be determined in consultation with the COE and MDE.

II. Long-Term Management Reports

Long-Term Management reports will be produced for the Tennyson site. Reports will provide information obtained from inspections and observations made during the annual walk through. Reports will follow the following format.

A Setting and Location

The Report will provide the address and a location map depicting the sites location in relation to cities, towns, or major roads, and other distinguishable landmarks. The location map will show the Tennyson site boundaries on a topographic map.

B History and Land Use

A brief description of the sites history and land use will be provided.

C Cultural Resources

A brief discussion on any cultural resources identified during mitigation work plan development and approval will be provided.

D Topography and Hydrology

A description of site topography and hydrology will be provided. Hydrologic conditions observed during the annual walk-through will be noted and monthly rainfall amounts for the year prior to the site walk through will be provided and compared to seasonal averages to supply some perspective on the observed condition. Any significant precipitation events (storms or flooding) will be noted. Any discernible change in hydrologic inputs such as precipitation, surface run-off and/or out of bank flooding will be noted. Likewise, should contributing drainage areas undergo significant land use change; a description of such change will be provided.
However, unless deemed necessary, no borings will be conducted nor monitoring wells be installed.

E Adjacent Land Uses

A description of land use adjacent to the mitigation site will be provided. Any significant change in adjacent land use will be described in order to provide some perspective, if any, on its influence of the mitigation site.

F Results of Annual Management and Monitoring

A summary of any site management will be provided describing any action(s) taken to ensure the long-term sustainability of the site and as further described in Section III below.

III Management and Monitoring

The overall goal of long-term management is to foster the long-term viability of the mitigation site's waters of the U.S., and any listed species/habitat. Routine monitoring and minor maintenance tasks are intended to assure the viability of the mitigation site in perpetuity.

A Biological Resources

The approach to the long-term management of the mitigation site's biological resources is to conduct annual site examinations and monitoring of selected characteristics to determine stability and ongoing trends of the preserved, restored, enhancement, and created waters of the U.S., including wetlands and

streams. Annual monitoring will assess the site's condition, degree of erosion, establishment of invasive or non-native species, water quality, fire hazard, and/or other aspects that may warrant management actions. While it is not anticipated that major management actions will be needed, an objective of this long-term management plan is to conduct monitoring to identify any issues that arise, and using adaptive management to determine what actions might be appropriate. Those chosen to accomplish monitoring responsibilities will have the knowledge, training, and experience to accomplish monitoring responsibilities.

Adaptive management means an approach to natural resource management which incorporates changes to management practices, including corrective actions as determined to be appropriate by the regulatory agencies in discussion with the Long-Term Steward. Adaptive management includes those activities necessary to address the affects of climate change, fire, flood, or other natural events. Before considering any adaptive management changes to the long-term management plan, the regulatory agencies will consider whether such actions will help ensure the continued viability of a site's biological resources.

The Long-Term Steward for the site shall implement the following:

Element A.1 Waters of the U.S., including wetlands

Objective: Monitor, conserve and maintain the site's waters of the U.S., including wetlands and/or streams. Limit any impacts to waters of the U.S. from vehicular travel or other adverse impacts.

Task: At least one annual walk-through survey will be conducted to qualitatively monitor the general condition of these habitats. General topographic conditions, hydrology, general vegetation cover and composition, invasive species, erosion, will be noted, evaluated and mapped during a site examination. Notes to be made will include observations of species encountered, water quality, general extent of wetlands and streams, and any occurrences of erosion, structure failure, or invasive or non native species establishment.

Task: Establish reference sites for photographs and prepare a site map showing the reference sites for the site's file. Reference photographs will be taken of the overall site at least every five years from the beginning of the long-term management.

Special attention should be paid to any area adjacent to or draining from the site. Streams and wetlands should be observed near site boundaries to observe if increased sediment deposition has occurred. The report should provide a discussion of any recent changes in the watershed (i.e., subdivision being developed upstream of site).

Element A.2 Threatened/Endangered Plant Species Monitoring (if applicable)

The Tennyson site has no known Rare, Threatened, or Endangered plant species, thus, this segment of the LTM plan is not applicable.

Objective: Manage to maintain habitat for specie(s) identified in the Mitigation Work Plan.

Task: Monitor status every year by conducting population assessment surveys. The annual survey dates will be selected during the appropriate period as identified by the Maryland department of Natural resources (MD DNR) and/or the U.S. Fish and Wildlife

Service (USFWS). Occupied habitat will be mapped and numbered to allow repeatable data collection over subsequent survey years. Abundance will be assessed semi-quantitatively using broad abundance categories, i.e., 0, 1 - 100, 101 - 500, 501 - 1,000, and >1,000 plants.

Task: Visually observe for changes to occupied habitat, such as changed hydrology or vegetation composition. Record any observed changes. Size of population (1 acre, etc).

Task: Implement other tasks that enhance or monitor habitat characteristics for the specie(s) identified in the Mitigation Work Plan.

Element A.3 Threatened/Endangered Animal Species Monitoring (if applicable)

The Tennyson site has no known Rare, Threatened, or Endangered animal species, thus, this segment of the LTM plan is not applicable.

Objective: Manage to maintain habitat for specie(s) identified in the Mitigation Work Plan.

Task: Monitor status every year by conducting population assessment surveys. [The annual survey dates will be selected during the appropriate period each year as identified by MD DNR and/or USFWS.]

Task: Implement other tasks that enhance or monitor habitat characteristics for specie(s) identified in the Mitigation Work Plan.

Element A.4 Invasive Species

Invasive species threaten the diversity or abundance of native species through competition for resources, predation, parasitism, interbreeding with native populations, transmitting diseases, or causing physical or chemical changes to the invaded habitat.

Objective: Monitor and maintain control over invasive species that diminish site quality for which the site was established. The Long-Term Steward shall consult the MD DNR at http://www.dnr.state.md.us for guidance on what species may threaten the site and on management of those species.

Task: Mapping of invasive species cover or presence shall occur each year. Mapping shall be accomplished through use of available technologies, such as GIS and aerial photography.

Task: Each year's annual walk-through survey (or a supplemental survey) will include a qualitative assessment (e.g. visual estimate of cover) of invasive species. Additional actions to control invasive species will be evaluated and prioritized in coordination with the regulatory agencies.

Element A.5 Vegetation Management

Objective: Analyze effects of any authorized silvicultural manipulations on the wetland, streams, and buffers on the site. If determined appropriate, develop and implement specific silvicultural manipulations (e.g. selective thinning) in coordination with the regulatory agencies.

Objective: Adaptively manage vegetation based on site conditions and data acquired through monitoring to maintain biological values.

Task: Review and explore potential vegetation management regimes as proposals and/or opportunities and funding arise. If determined to potentially maintain site quality, develop specific silvicultural practices, amend this long-term management plan with the regulatory agencies approval to reflect those practices, and implement silvicultural actions as funding allows.

Task: Implement vegetation management techniques, if determined beneficial and as funding allows, to allow development of vegetation as identified in the Mitigation Work Plan. Implementation of vegetation management techniques must be approved by the regulatory agencies.

B Security, Safety, and Public Access

The Tennyson site will be posted or appropriately marked and shall have no general public access, nor any regular public use. Research and/or other educational programs or efforts, hunting, and passive recreational activities may be allowed on the site as deemed appropriate by the regulatory agencies, but are not specifically funded or a part of this long-term management plan.

Potential mosquito abatement issues will be addressed through the development of a plan by the Long-Term Steward and any local mosquito control district or local health department in coordination with and approved by the regulatory agencies.

Potential wildfire fuels will be reduced as needed where approved by the regulatory agencies.

Element B.1 – Trash and trespass

Objective: Monitor sources of trash and trespass.

Objective: Collect and remove trash, repair vandalized structures, and rectify trespass impacts.

Task: During each site visit, record occurrences of trash and/or trespass. Record type, location, and management mitigation recommendations to avoid, minimize, or rectify a trash and/or trespass impact.

Task: At least once yearly collect and remove as much trash as possible and repair and rectify vandalism and trespass impacts.

Element B.2 – Fire Hazard Reduction

Objective: Maintain the site as required for fire control while limiting impacts to biological values.

Task: Reduce vegetation in any areas recommended by authorities, and as approved by the regulatory agencies, for fire control.

C Infrastructure and Facilities

Element C.1 Fences, Gates, Signage, Crossings, and Property Boundaries

Objective: Monitor condition of fences, gates, signage, crossings, and property boundaries.

Objective: Maintain fences, gates, signage, crossings and property boundaries to prevent casual trespass, allow necessary access, and facilitate management.

Task: During each site visit, record condition of fences, gates, signs, crossings, and property boundaries. Record location, type, and recommendations to implement repair or replacement to fence, gate, signage, crossings or property boundary markers, if applicable.

Task: Maintain fences, gates, signs, crossings and property boundary markers as necessary by replacing posts, wire, gates, and signs. Replace fences and/or gates, as necessary, and as funding allows. Note any trespass by livestock.

Element C.2 Berms, Structures, and Roads

Objective: Monitor condition of berms, structures, and roads.

Objective: Maintain berms, structures, and roads to facilitate management and maintain conditions of wetlands and streams

Task: During each site visit, record condition of berms, structures, and roads. Record location, type, and recommendations to implement repair or replacement to berms, structures, and roads, if applicable.

Task: Maintain berms, structures, and roads as necessary. Replace berms, structures, and roads as necessary, and as funding allows.

D Reporting and Administration

Element D.1 Annual Report

Objective: Provide annual report on all management tasks conducted and general site conditions to COE and MDE and any other appropriate parties. Each report shall include a cover page with the following information: the site name (if applicable), Long-Term Steward (name, address, phone number, and email address), monitoring year, and any requested action (e.g. maintenance recommendations requiring regulatory approval).

Task: Prepare annual report and any other additional documentation. Include a summary. Complete and circulate to the COE and MDE and other parties by December 31 of each year. Reports should be distributed electronically.

Task: Make recommendations with regard to (1) any enhancement measures deemed to be warranted, (2) any problems that need near-,short-, and long-term attention (e.g., weed removal, fence repair, erosion control), and (3) any changes in the monitoring or

management program that appear to be warranted based on monitoring results to date. Provide documentation of the cost of any recommended maintenance and repairs.

IV Transfer, Replacement, Amendments, and Notices

A Transfer

Any subsequent transfer of responsibilities under this long-term management plan to a different Long-Term Steward shall be requested by the Long-Term Steward in writing to the COE and MDE, shall require written approval by the COE and MDE, and shall be incorporated into this long-term management plan by amendment.

The long-term steward shall be required to ensure that any subsequent property owners (if not identified as the long-term steward) are notified of the deed restriction, conservation easement, purpose and location of the mitigation site lands, and requirement for long-term stewardship.

B Replacement

If the Long-Term Steward fails to implement the tasks described in this long-term management plan and is notified of such failure in writing by any of the regulatory agencies, the Long-Term Steward shall have 90 days to cure such failure. If failure is not cured within 90 days, the Long-Term Steward may request a meeting with the regulatory agencies to resolve the failure. Based on the outcome of the meeting, or if no meeting is requested, the regulatory agencies may designate a replacement Long-Term Steward in writing by amendment of this long-term management plan. If the Long-Term Steward fails to designate a replacement Long-Term Steward, then such public or private land or resource management organization acceptable to and as directed by the regulatory agencies may enter onto the site's property in order to fulfill the purposes of this long-term management plan.

C Amendments

The Long-Term Steward, property owner, and the regulatory agencies may meet and confer from time to time, upon the request of any one of them, to revise the long-term management plan to better meet management objectives and preserve the conservation values of the mitigation site. Any proposed changes to the long-term management plan shall be discussed with the COE and MDE and the Long-Term Steward. Any proposed changes will be designed with input from all parties.

Amendments to the long-term management plan shall be approved by the COE and MDE in writing shall be required management components and shall be implemented by the Long-Term Steward.

If the Maryland Department of Natural Resources (MD DNR) or U.S. Fish and Wildlife Service (USFWS) determine, in writing, that continued implementation of the long- term management plan would jeopardize the continued existence of a state or federally listed species, any written amendment to this long-term management plan, determined by either the MD DNR or USFWS as necessary, shall be a required management component and shall be implemented by the Long-Term Steward.

D Notices

Any notices regarding this long-term management plan shall be directed as follows:

Long-Term Steward:

Maryland State Highway
Administration Office of Environmental Design
707 N. Calvert Street, Baltimore, Maryland 21202 PH -410-545-8628
Email:tnichols@sha.state.md.us

Regulatory Agencies:

U.S. Army Corps of Engineers
Baltimore District, P.O. Box
Baltimore, Maryland 21203-1715
PH – 410-962–7608

Maryland Department of the Environment
1715, 1800 Washington Boulevard
Baltimore, Maryland 21230
PH – 410-537-3000

V Funding and Task Prioritization

A Funding

The funding of costs for the long term management of any mitigation site shall be provided by the Maryland State Highway Administration through the Environmental Preservation Fund.

B Task Prioritization

Due to unforeseen circumstances, prioritization of tasks, including tasks resulting from new requirements, may be necessary if insufficient funding is available to accomplish all tasks. The Long-Term Steward and the regulatory agencies shall discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order: 1) required by a local, state, or federal agency; 2) tasks necessary to maintain or remediate a mitigation site (including unauthorized impacts); and 3) tasks that monitor resources, particularly if past monitoring has not shown downward trends. Equipment and materials necessary to implement priority tasks will also be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the IRT and as authorized by the IRT in writing.

C Enforcement

The regulatory agencies and its authorized agents shall have the right to inspect the Bank sites and take actions necessary to verify compliance with this Long-Term Management Plan. The Long-Term Management Plan herein shall be enforceable by any proceeding at law or in equity or administrative proceeding by the Corps or MDE. Failure by any agency (or owner) to enforce the Long-Term Management Plan contained herein shall in no event be deemed a waiver of the right to do so thereafter.

APPENDIX H

TENNYSON MITIGATION BANK MONITORING PLAN

Tennyson Wetland Mitigation and Banking

Monitoring Plan
June 2019
Revised March 2022

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

TENNYSON WETLAND MITIGATION AND BANKING MONITORING PLAN

SHA Contract No. SM7745171

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Attachment 2: Tennyson Crediting Zones
Attachment 3: IRT Performance Standards and Monitoring Protocol for Nontidal Wetland Mitigation Banks

INTRODUCTION

The Tennyson Wetland Mitigation and Banking Site consists of the creation of 10.79 acres of palustrine forested wetland for the Maryland Department of Transportation (MDOT) State Highway Administration (SHA) in St. Mary's County, Maryland (see **Attachment 1, Project Location Map**). There is a total of 1.11 temporary wetland impacts and 0.03 permanent wetland impacts. Of the 1.11 acres of temporary wetland impacts, 0.82 acres will be enhanced from PEM to PFO, and 0.29 acres will remain as PEM wetlands following construction. The wetland enhancement is proposed where existing palustrine emergent wetlands within the mitigation area will be planted with woody species. The Tennyson Wetland Mitigation Site is located in Maryland watershed 02-13-11-01 (Patuxent River Lower Watershed).

The site was initially proposed as a compensatory wetland mitigation site for the MD 5 Point Lookout Project. Impact reductions associated with the MD 5 Point Lookout Project resulted in a surplus of mitigation credits and MDOT SHA decided to make the site a mitigation bank.

This plan describes how monitoring and reporting should be conducted post-construction. Post-construction monitoring will be conducted over a 10-year period or until it is demonstrated that the project has met or exceeded its goals and the regulatory agencies agree that no further monitoring is needed.

Detailed monitoring should be conducted in years 2, 3, 5, 7, and 10 and should include reporting for agency review and comment. A timeline of the various monitoring efforts is provided in **Table 1**.

Table 1: Monitoring Summary / Timeline

Monitoring Task	Pre-construction	Yr. 2	Yr. 3	Yr. 5	Yr. 7	Yr.10
Visual Assessment / Photo Documentation	X	X	X	X	X	X
Wetland Monitoring		X	X	X	X	X
Reporting						
Monitoring Report		X	X	X	X	X

PROJECT GOALS

The project goals include providing wetland mitigation banking credits and the creation of wetlands and sustainable replacement of wetland functions and values. The latest design report should be referenced for additional information relating to project goals, design, and functional uplift.

WETLAND MONITORING

The wetlands should be monitored in accordance with the IRT Performance Standards and Monitoring Protocol for Nontidal Wetland Mitigation Banks (February 1, 2022) (Attachment 2). The elements that comprisethe current mitigation monitoring protocol are vegetation, hydrology, soils, and remediation measuresproposed. These monitoring procedures will be implemented at the Tennyson Mitigation Bank Site.

ANNUAL REPORT

Monitoring reports should be submitted to the MDOT SHA by October 31, for review and comment. MDOT SHA will distribute to the regulatory agencies by December 31 of years 2, 3, 5, 7 and 10.

MDOT SHA shall submit annual monitoring reports no later than December 31 of each calendar year to:

- Maryland Department of the Environment, 1800 Washington Boulevard, Suite 430, Baltimore, Maryland 21230, Attn: Kelly Neff.
- US Army Corps of Engineers Baltimore District, PO Box 1715 Baltimore Maryland 21203, Attn: Jack Dinne

See Attachment 2 for the reporting requirements.

ADAPTIVE MANAGEMENT

If it is determined that the design goals of the project are not being met, the monitoring team will discuss the identified problems with MDOT SHA and the design team, and an Adaptive Management Plan (AMP) would be developed to assess the problem(s) and develop recommendations for remediation. Depending on the problem, the plan could include more detailed assessments including:

Adaptive Management strategies for wetland areas:

1) Adjustment of monitoring schedule based on site conditions.
2) Additional hydrologic monitoring if necessary.
3) Hydrologic adjustment if necessary.
4) Invasive species treatment recommendations if appropriate.
5) Vegetation protective measures as appropriate.
6) Supplemental plantings if necessary.
7) Soil amendments if warranted.
8) Recommendations for supplemental vegetative plantings, invasive species control, animal control, etc.

Once the site is assessed the monitoring team will coordinate the findings with the designers and MDOT SHA and recommendations will be developed. The agencies will be informed of the assessment findings and the recommendations. If needed, an interagency meeting will be conducted with the regulatory agencies and the property owner to determine the best course of action.

REFERENCES

Harman, W., R. Starr, M. Carter, K. Tweedy, M. Clemmons, K. Suggs, and C. Miller. 2012. A Function-Based Framework for Stream Assessment and Restoration Projects. U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds. Washington, DC. EPA 843-K-12-006. Online: https://www.epa.gov/sites/production/files/2015-08/documents/a_function_based_framework_for_stream_assessment_3.pdf

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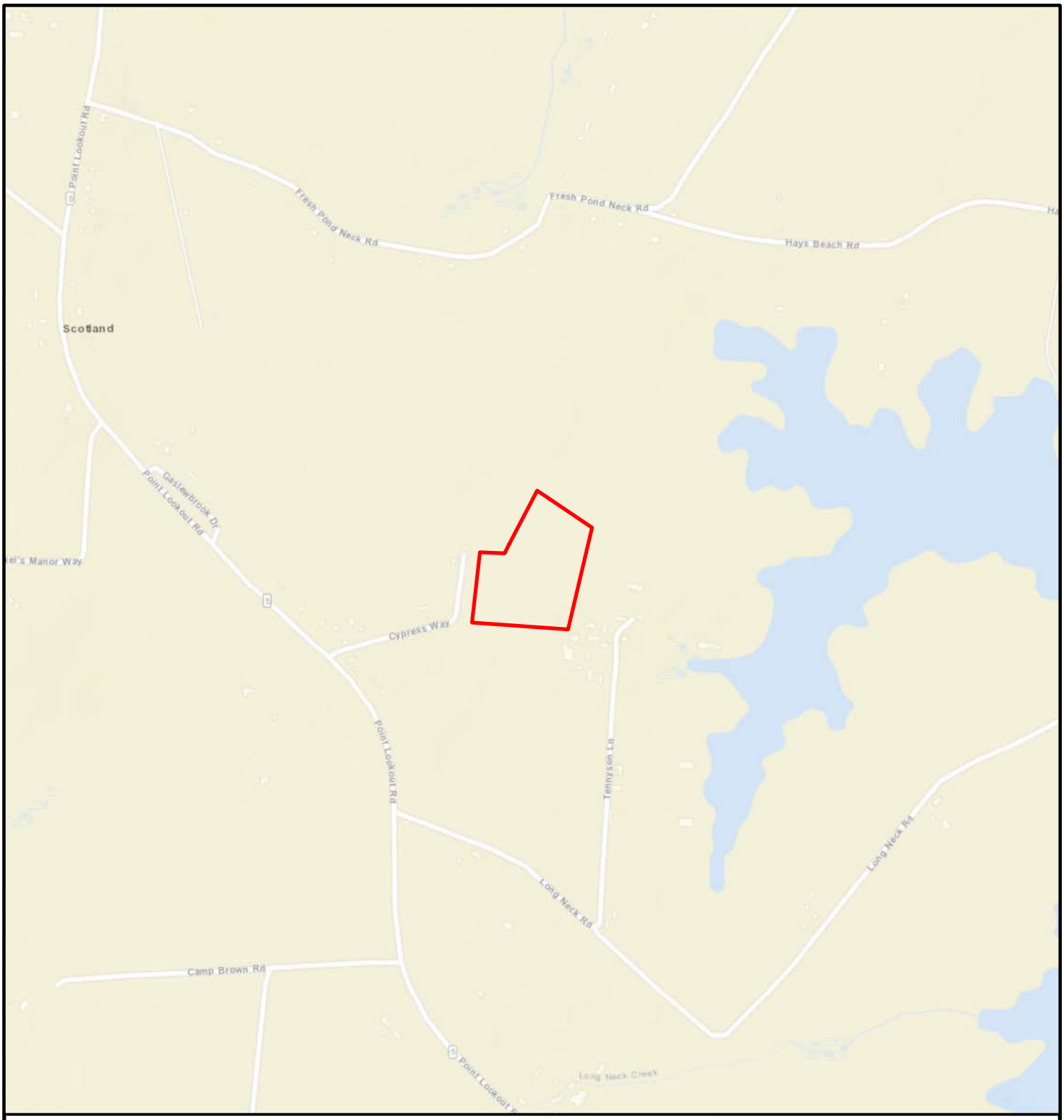
Swearingen, J., B. Slattery, K. Reshetiloff, and S. Zwicker. 2010. Plant Invaders of Mid-Atlantic Natural Areas, 4th ed. National Park Service and U.S. Fish and Wildlife Service. Washington, DC. 168pp.

ATTACHMENT 1:
PROJECT LOCATION MAP



TENNYSON MITIGATION BANK - LOCATION MAP

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

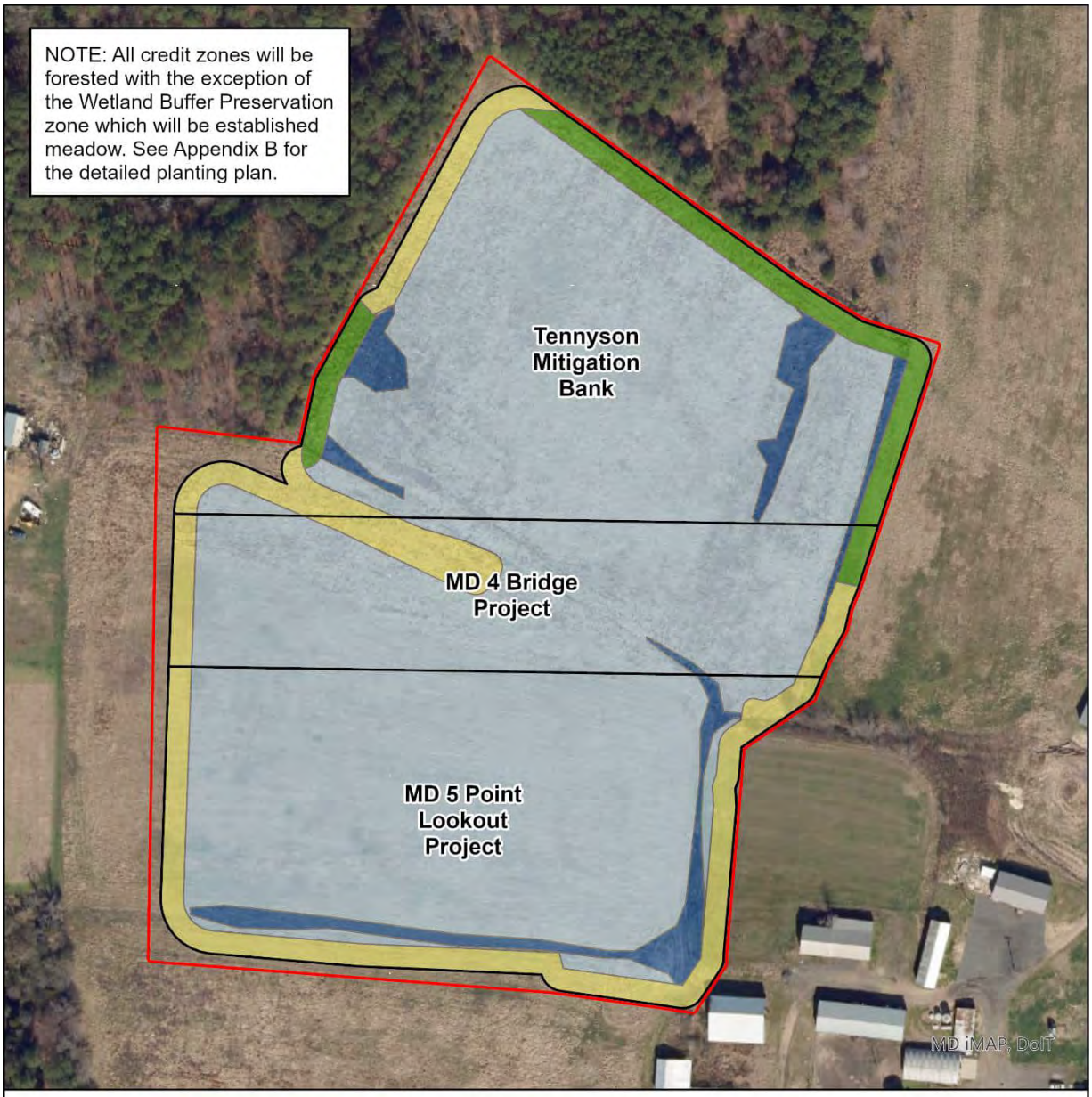
Legend

Project Vicinity

N

1 inch = 1,000 feet

ATTACHMENT 2:
Tennyson Crediting Zones



TENNYSON MITIGATION BANK SITE -- CREDITING ZONES

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

Legend

- Wetland Buffer Enhancement
- Wetland Buffer Preservation
- Wetland Enhancement
- Wetland Restoration
- Easement Boundary
- Mitigation Project Boundary

N

1 inch = 180 feet

ATTACHMENT 3:
IRT Performance Standards and Monitoring Protocol for Nontidal Wetland Mitigation Banks

ECOLOGICAL PERFORMANCE STANDARDS AND MONITORING PROTOCOL FOR NONTIDAL WETLAND MITIGATION BANKS AND IN-LIEU FEE SITES IN MARYLAND

February 1, 2022

Nontidal wetland mitigation bank and in-lieu fee (ILF) sites ("site") shall conform to the following interim-based and final performance standards (Section I below) by the end of the monitoring period, unless otherwise determined by the Interagency Review Team (IRT) co-chairs (the U.S. Army Corps of Engineers and the Maryland Department of the Environment), in coordination with the Maryland Interagency Review Team (IRT). Monitoring timeframes, monitoring reports, monitoring report measurements, and adaptive management for mitigation sites must be consistent with the requirements in Sections II-V below. In addition, please see, "Standard Methods for Monitoring Vegetation, Hydrology, and Soils in Wetland Mitigation Sites in Maryland" below (pages 12-18) for the recommended techniques for monitoring wetland mitigation sites.

I. Performance Standards: The Bank or ILF Sponsor shall provide all required documentation, including monitoring reports, construction completion reports, and as-built surveys to the co-chairs for distribution to the IRT. The co-chairs, in consultation with the IRT, will use visual observations during site visits and monitoring reports to evaluate attainment of performance standards and performance-based milestones and in determining whether part of or the entire site is successful or whether corrective actions are warranted. Except for standards for Invasive Species and Wetland Species Richness, which will be determined by cell, success for each of the following standards will be determined at each sampling plot and/or well location. Presenting averages or means of plot data across a site is not satisfactory to demonstrate success. All the following standards and milestones will be used to assess project success and must be achieved each monitoring year.

A. Wetland Area(s):

1. **Wetland Vegetation Dominance:** Wetland vegetation dominance, defined as a vegetation community where more than 50% of all dominant plant species across all strata are rated obligate ("OBL"), facultative wet ("FACW"), or facultative ("FAC"), using the vegetation sampling procedures as described in the appropriate regional supplement to the Corps of Engineers Wetland Delineation Manual, must be achieved; and

2. **Aerial Cover Vegetative Standards:**
   a) For sites that require monitoring in year one, the mitigation site shall have a minimum of 50% native (FAC or wetter) species cover.
   b) By the end of year two, the mitigation site shall have a minimum of 60% native (FAC or wetter) species cover.
   c) By the end of year three, the mitigation site shall have a minimum of 70%native (FAC or wetter) species cover.
   d) By the end of year five and each monitoring year thereafter, the mitigation site shall have a minimum of 85% native (FAC or wetter) species cover.
   e) Volunteer species should support functions consistent with the project design goals; and

3. **Non-Native and Invasive Species:** The goal of any mitigation site is to have no non-native or invasive species. However, if non-native or invasive species are present, no more than 10% of relative plant cover[1] over the entire site shall be made up by non-native or invasive

[1] "Relative plant cover" is defined as the cover of a particular species as a percentage of total plant cover. Thus,

species, with no individual colony greater than or equal to 5% of relative plant cover. No more than 5% of relative plant cover over the entire site shall be made up of *Phragmites australis*[2], *Persicaria perfoliata, Pueraria montana*, or *Lythrum salicaria*. The presence, location, and percent cover of invasive and/or non-native species shall be noted on the mitigation plan. Invasive species are identified on the 2010 National Park Service/U.S. Fish and Wildlife Service document *Plant Invaders of Mid Atlantic Natural Areas*[3] and the Maryland Invasive Species Council Invasive Species of Concern in Maryland[4]. Native status will be based on the Natural Resources Conservation Service Plants Database[5]. *Phalaris arundinacea* and *Typha* spp. may also be considered as invasive species by IRT. Alternatively, for specific problematic species, the IRT may consider justification for different requirements; and

4. **Wetland Species Richness:**
   a) For scrub/shrub wetlands, establish a minimum of three species of native wetland shrubs (FAC or wetter) with no more than 65% relative cover of one species, over the entire site. Loblolly pine cannot be more than 35% relative cover.
   b) For forested wetlands, establish a minimum of three species of native wetland trees and two species of native wetland shrubs (FAC or wetter) with no more than 65% relative cover of one species, over the entire site. Loblolly pine cannot be more than 35% relative cover; and

5. **Wetland Vegetation Density for Scrub-Shrub and Forested Wetlands:** For scrub-shrub or forested wetlands, native wetland (FAC or wetter) plant density of at least 435 living trees/shrubs per acre with a minimum height of 10 inches shall be achieved by the end of the first year a monitoring report is required and maintained each monitoring year thereafter through the end of the monitoring period; and

6. **Wetland Vegetation Cover for Forested Wetlands:** For forested wetlands, average tree height of tallest five native wetland (FAC or wetter) trees within each sample plot shall be at least three feet in height at year three and at least five feet in height at year five and each monitoring year thereafter. Canopy cover[6] of native wetland (FAC or wetter) trees and shrubs must be at least 30% by the end of the monitoring period; and

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relative cover will always total 100%, even when total absolute cover is quite low.

[2] American Common Reed, *Phragmites australis* subsp. *americanus*, while uncommon, is not considered to be an invasive plant.

[3] https://www.invasive.org/alien/pubs/midatlantic/midatlantic.pdf

[4] http://mdinvasives.org/species-of-concern/

[5] https://plants.sc.egov.usda.gov/

[6] "Canopy cover" is defined as the percentage of ground covered by tree and shrub leaves, when the edges of the leaves are mentally projected down to the ground surface.

7. **Wetland Hydrology:**
   a) At a minimum, the site must be inundated (flooded or ponded) or the water table is 12 inches or less below the soil surface for at least 14 or more consecutive days during the growing season in most years (greater than or equal to 50 percent probability). Short-term monitoring (less than 10 years) must consider the normality of rainfall occurring prior to and during the monitoring period when addressing the frequency requirement. For the purpose of this determination, the growing season should be based on median dates (i.e., 50 percent probability) of 28ºF air temperatures in spring and fall, based on the long-term data for the nearest appropriate weather station, as recorded in the WETS tables available from the NRCS National Water and Climate Center (https://www.wcc.nrcs.usda.gov/climate/navigate_wets.html), or as specified in the appropriate regional supplement to the Corps of Engineers Wetland Delineation Manual, and
   b) The overall seasonal hydroperiod (depth, degree, duration, and periodicity) shall be similar to that of an IRT-approved reference wetland or targeted wetland type, with the acceptable range of the seasonal hydroperiod specified in the approved Mitigation Plan.

8. **Anaerobic Soil Conditions:** The entire wetland restoration or creation area must meet the Hydric Soil Technical Standard (Technical Note 11) developed by the National Technical Committee for Hydric Soils for saturated conditions and anaerobic conditions at a minimum frequency of 3 years out of the 5 monitoring years (50 percent or higher probability):
   a) Free water must exist within 10 inches (25 cm) of the ground surface for at least 14 consecutive days; and
   b) Anaerobic conditions must exist within 10 inches (25 cm) of the ground surface for at least 14 consecutive days. Anaerobic conditions may be determined by one of the following methods[7], as detailed in the Hydric Soil Technical Standard:
      (1) Positive reaction to alpha-alpha dipyridyl, determined as least weekly.
      (2) Reduction of iron determined with IRIS devices (tubes or films) installed for 30 days.
      (3) Measurement of redox potential (Eh) using platinum electrodes, determined at least weekly.

9. **Topsoil:** For areas where grading occurred or topsoil has been removed, the entire wetland restoration, creation or enhancement area must have a depth of at least 6 inches topsoil, or other depth as approved in the Mitigation Plan. Imported topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand, unless previously approved by the IRT. Imported topsoil must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter. If the soil surface has a Munsell value or chroma >3, then soil organic matter (using the Walkley-Black method), must show the site has at least 2% organic matter. Alternatively, if the site was designed to have similar soils as an approved reference wetland soil, the organic matter content is within the range specified in the approved Mitigation Plan.

10. **Bulk Density:** The subsoil shall have a bulk-density of less than 85 lbs/cubic foot (1.35 g/cc) for loamy and finer textured soils and less than 107 lbs/cubic foot (1.70 g/cc) in sands

[7] In order for results to be valid, methods must follow the "Recommended Methods for Monitoring Vegetation, Hydrology, and Soils in Wetland Mitigation Sites in Maryland" located at the end of this document.

(prior to adding topsoil or organic matter). Sites designed to be precipitation driven may include alternate bulk density requirements specified in the approved Mitigation Plan.

11. **Microtopography:** Microtopographic variations are up to 0.5 feet from design elevation, with no more than 25 percent of each wetland cell remaining at the design elevation. Alternatively, if microtopography was designed to mimic a reference wetland, the elevation variations are within the range specified in the approved Mitigation Plan.

12. **Woody Debris**: Coarse woody debris (e.g., logs, brush piles, root wads, overturned stumps, standing snags, etc.) is present throughout the mitigation site at a density and type specified in the approved Mitigation Plan.

13. **Delineation of Aquatic Resources:** At the mid-term monitoring year (year 3 for a 5-year monitoring period and year 5 for a 10-year monitoring period) and at the final year of the monitoring period, the wetland boundary area (established/ re-established/ restored/ enhanced/ preserved) as shown on the approved mitigation plan, shall be delineated using the wetland criteria outlined in the Corps of Engineers Wetlands Delineation Manual (1987) and appropriate regional supplement(s)). Delineated wetlands shall be broken into projected vegetative type (e.g., emergent, scrub-shrub, forested) based on species present and density. In addition, all special aquatic sites, other waters, such as lakes and ponds, and all streams, within the approved mitigation site shall be identified and delineated. The delineated aquatic resource mitigation areas as verified by the co-chairs shall be consistent with the approved mitigation plan and contain at least as much wetland acreage and waterway linear feet as required in the mitigation plan. Deep water habitats and unvegetated areas that do not meet wetland criteria shall not be included in area measurements.

14. **Wetland function assessment:** The mitigation site should meet the intended goals and objectives of the project, as specified in the approved Mitigation Plan. An assessment of the specific wetland functions and values being provided should be conducted.

B. Buffer Area(s): The Buffer Area Performance Standards are required to be met if the buffer is getting mitigation credit. If upland or wetland areas were cleared to provide access for construction, but will not be getting mitigation credit, they will still be required to meet the following Performance Standards:

1. **Aerial Cover Vegetative Standards:**
   a) For sites that require monitoring in year one, the mitigation site shall be vegetated with a minimum of 50% native species cover.
   b) By the end of year two, the mitigation site shall be vegetated with a minimum of 60% native species cover.
   c) By the end of year three, the mitigation site shall be vegetated with a minimum of 70% native species cover.
   d) By the end of year five and each monitoring year thereafter, the mitigation site shall be vegetated with a minimum of 85% native species cover.
   e) Volunteer species should support functions consistent with the project design goals; and

2. **Non-Native and Invasive Species:** The goal of any site is to have no non-native or invasive species. However, if non-native or invasive species are present, no more than 10% of relative plant cover[1] over the entire site shall be made up by non-native or invasive species, with no

individual colony greater than or equal to 5% of relative plant cover. No more than 5% of relative plant cover over the entire site shall be made up of *Phragmites australis*[2], *Persicaria perfoliata*, or *Pueraria montana*. The presence, location, and percent cover of invasive and/or non-native species shall be noted on the mitigation plan. Invasive species are identified on the 2010 National Park Service/U.S. Fish and Wildlife Service document *Plant Invaders of Mid Atlantic Natural Areas*[8] and the Maryland Invasive Species Council Invasive Species of Concern in Maryland[9]. Native status will be based on the Natural Resources Conservation Service Plants Database[10]. Alternatively, for specific problematic species, the IRT may consider justification for different requirements.

3. **Vegetation Density for Forested Buffers:** For forested buffers, native plant density of at least 435 living trees/shrubs per acre with a minimum height of 10 inches shall be achieved by the end of the first year a monitoring report is required and maintained each monitoring year thereafter through the end of the monitoring period; and

4. **Vegetation Cover for Forested Buffers:** For forested buffers, average tree height of tallest five native trees within each sample plot shall be at least three feet in height at year three and at least five feet in height at year five and each monitoring year thereafter. Canopy cover[11] of native trees and shrubs must be at least 30% by the end of the monitoring period.

II. Monitoring Timeframe:

A. The Sponsor will be responsible for monitoring the site for a period specified in the approved mitigation plan. The Corps of Engineers' 2008 Mitigation Rule requires the monitoring period to be sufficient to demonstrate that the compensatory mitigation project has met performance standards and be a minimum period of five years (33 CFR 332.6(b)). However, longer monitoring periods of more than 5 years are warranted for aquatic resources with slow development rates (e.g., vernal pools, riparian forest, forested wetlands, and coastal salt marsh). In accordance with federal requirements, all monitoring of mitigation sites regulated by the Corps must adhere to the minimum standards provided in Regulatory Guidance Letter 08-03, *Minimum Monitoring Requirements for Compensatory Mitigation Projects Involving the Restoration, Establishment, and/or Enhancement of Aquatic Resources,* (https://www.nab.usace.army.mil/Missions/Regulatory/Mitigation/).

B. The monitoring period begins the year the mitigation planting occurs, unless planting occurs after April 15, in which case the monitoring period will not begin until the following year. For each monitoring report, vegetative monitoring shall be conducted between May 1 and September 30 for forested/scrub-shrub systems and between June 15 and September 30 for emergent systems. Site visits should preferably be during a period with normal precipitation and groundwater levels.

C. Monitoring must be conducted a minimum of once per year during the years that monitoring reports are required. Certain sites may require more frequent monitoring (e.g., twice a year during spring and fall) and reporting during the early stages of development to quickly identify and

[8] https://www.invasive.org/alien/pubs/midatlantic/midatlantic.pdf
[9] http://mdinvasives.org/species-of-concern/
[10] https://plants.sc.egov.usda.gov/
[11] "Canopy cover" is defined as the percentage of ground covered by tree and shrub leaves, when the edges of the leaves are mentally projected down to the ground surface.

address problems and/or concerns. The extent of monitoring may be reduced or waived no earlier than the end of the fifth monitoring year over part or the entire site upon a determination by the co-chairs, in consultation with the IRT, that the site has achieved all performance-based milestones each monitoring year and all final performance standards for two consecutive monitoring events[12]. Conversely, the co-chairs, in consultation with the IRT, may extend the original monitoring period upon a determination that performance standards have not been met, the site is not on track to meet them (e.g., remediation or adaptive management required), or in consideration of the amount and distribution of precipitation prior to and during the growing season compared with analyses of normal precipitation ranges and other climatic variables at or near the project location. Remediation measures[13] (e.g., invasive species management, replanting, controlling encroachment, etc.), if required, should not have occurred during the last two full growing seasons prior to requesting reduction or waiver of remaining monitoring requirements to ensure the site is self-sustaining. If a natural disaster occurs during the monitoring period, remediation or adaptive management may be required and the monitoring period may be extended. On-site conditions, the complexity of the approved mitigation plan, and unforeseen circumstances will ultimately determine whether the monitoring period should be extended beyond the specified monitoring time frame, or the extent of monitoring terminated/reduced for a particular project.

III. Monitoring Reports: Monitoring reports should be concise and effectively provide the information necessary to assess the status of the site. Reports should provide information necessary, including supporting data such as plans, maps, and photographs, to illustrate site conditions and whether the site is meeting its objectives and performance standards.

A. Monitoring reports, a paper copy, and an electronic version, must be submitted to the co-chairs by December 31 of each monitoring year. The Sponsor must concurrently upload a copy of the monitoring report to RIBITS for access by the IRT. If five years of monitoring is required, monitoring reports shall be submitted annually. If ten years of monitoring is required, monitoring reports shall be submitted for years 2, 3, 5, 7, and 10 ("monitoring years") following completion of construction and planting of the mitigation site or phase thereof. Failure to submit monitoring reports will result in non-compliance of permit conditions and delay of approval of any remaining credits and formal release from future monitoring requirements until reports are submitted and approved by the Corps and MDE in consultation with the IRT.

B. Content: The following information must be included with the monitoring report:

1. **Monitoring and Performance Standards Summary Report and Table** comparing the required performance standards to the conditions and status of the developing site must be completed and attached to the beginning of the Monitoring Report. The table will list the monitoring requirements and performance standards, as specified in the approved mitigation plan, and evaluate whether the overall site, including each area (plot, well or cell as appropriate), is successfully achieving the approved performance standards or trending towards success. This table should include whether each performance standard was met for the current and past monitoring report years, to allow easier review of how the site is progressing. Monitoring reports shall be submitted consistent with the current IRT-approved

[12] Performance standards for wetland hydrology and anaerobic soil conditions must be met at least 3 years or 50% or monitoring years, whichever is greater, for the IRT to consider reducing or waiving monitoring early.
[13] An exception may include treatment for small amounts of invasive species that are not likely to persist.

monitoring report format, using the "Mitigation Monitoring Report Form."

2. **Project Overview / Background Data:**
   a) Title page indicating the bank/in-lieu fee site name, umbrella bank name (if applicable), in-lieu fee program name (if applicable), project phase (if applicable), monitoring year, any requested action (e.g., credit release, IRT review), Sponsor identification (name, address, phone number, and email address) and preparer identification (name, address, phone number, and email address).
   b) Written description of the location, any identifiable landmarks of the site, including information to locate the site perimeter(s), and coordinates of the mitigation site (expressed as latitude and longitude).
   c) Date(s) of site inspections.
   d) A brief paragraph describing the goals and objectives of the site, including the proposed mitigation acreage and aquatic resource type approved as part of the mitigation plan. Include the dates the mitigation construction was started, and the planting was completed.
   e) A brief narrative description of the site addressing its position in the landscape, adjacent waterbodies, and adjacent land use.
   f) Describe methods used to evaluate performance standards. Plot locations should be clearly identified on the appropriate maps.
   g) A short statement on whether the performance standards are being met.
   h) A narrative description of existing mitigation site conditions and functions and how the site has or has not achieved the goals, objectives and performance standards established for the project.
   i) Dates of any recent corrective or maintenance activities conducted since the previous report submission.
   j) If monitoring or site inspections were conducted between years of required monitoring (e.g., year four in a 10-year monitoring period), this data should also be included.
   k) Specific recommendations for any additional corrective or remedial actions.
   l) Estimate the percent of the site that is establishing into wetland and the type of wetland system (ex: forested, scrub-shrub, emergent). If this differs from what was planned, show the boundaries of the actual wetland area/types on the plans or maps.
   m) Estimate the percent of the site buffer that is establishing into forested buffer. If this differs from what was planned, show the boundaries of the actual forested buffer area on the plans or maps.
   n) Discussion of growing season and how it was determined for this site.

3. **Summary data:** Summary data should be provided to substantiate the success and/or potential challenges associated with the compensatory mitigation project. Refer to Section IV below for monitoring report measurements to include for the overall site.

4. **Photographs:** Take one set of photographs from established photographic points any time between May 1 and September 30 of each monitoring year (pictures should be taken at the same time of year when possible). Photo location points should be identified on the appropriate maps and labeled with the direction in which the photo was taken. Submitted photos should be formatted to print on a standard 8.5 by 11-inch piece of paper, dated, and clearly labeled with the direction from which the photo was taken. It is highly recommended that aerial photos are also provided, as these are good indicators of hydrology and vegetative cover.

5. **Maps and Plans:** Maps should be provided to show the location of the site relative to other landscape features, habitat types, locations of photographic reference points, transects, sampling data points (e.g., vegetation plots, wells, soil samples, etc.), and/or other features pertinent to the mitigation plan. GPS coordinates should be shown on the plans for each photographic reference point and sample plot. In addition, the submitted maps and plans should clearly delineate the mitigation site perimeter(s), which will assist the project managers in locating the mitigation area(s) during subsequent site inspections. Each map or diagram should be formatted to print on a standard 8.5 by 11-inch piece of paper and include a legend and the location of any photos submitted for review. As-built plans should be included if they were not already submitted to the co-chairs.

6. **Conclusions:** A general statement shall be included that describes the conditions of the site. If performance standards are not being met, a brief explanation of the difficulties and potential remedial actions proposed by the Sponsor, including a timetable, must be provided. The co-chairs, in consultation with the IRT, will ultimately determine if the mitigation site is successful for a given monitoring period.

IV. Monitoring Report Measurements. Monitoring reports should include all the following information for the overall site, and each plot, well or cell:

A. Wetland Area(s):

1. **Vegetation:**
   a) Estimate the actual and relative percent cover by plant species, in order of dominance, across all strata for each plot. Include this information in a table. For each species listed in the table include native/non-native status and wetland indicator status. Summarize the data by plot, cell, and overall site. The presence, location, and percent cover of colonies of invasive and/or non-native species shall be mapped on the mitigation plan.
   b) For scrub-shrub or forested wetlands, estimate the percent survival of planted trees and number of native wetland (FAC or wetter) trees/shrubs per acre (including volunteer woody species at least ten inches). Data should be summarized for each plot and by cell and overall site. Please note that projects where the vegetation is inconsistent throughout the site may not meet the performance standards (e.g., a site where some portions have high densities of woody species, but other portions have low densities).
   c) For scrub-shrub or forested wetlands, measure the height of the tallest five trees within each sample plot in each monitoring year. In the final year of monitoring, measure canopy cover of native wetland (FAC or wetter) trees and shrubs.
   d) Summarize the results from the vegetation plot study, including how the vegetation meets/does not meet performance standards. Data should be summarized for each plot, by cell, and for the entire site. Include a discussion of water movement into and through the site. Do not include the raw plot data in your monitoring report.

2. **Hydrology:**
   a) Estimate percent of site that is inundated or saturated to the surface on the dates of the site visits.
   b) Monitoring data for surface water and groundwater, including hydrograph of measured depth to water table, after calibrating for above-ground height of well. Data should be

included for each well separately.

c) Discuss analyses of how precipitation, drought, and other climatic factors during this monitoring year compared with the normal range of those factors that would be expected, based on data collected at or near the project location over a rolling 30-year period. Climatic and precipitation normal ranges are informed through the use of multiple tools and site-specific data such as, but not limited to, the antecedent precipitation tool (APT[14]) , WETS tables[15] , Standard Precipitation Index[16] , NOAA/National Weather Service Meteorological Stations, National Weather Service – MidAtlantic River Forecast Center – Precipitation Departures[17] , USDA National Water and Climate Center[18] , aerial photography, soil mapping, LIDAR, topographic mapping, NWI maps, site-specific physical and biological field indicators, etc. It is important to recognize that APT and other tools inform normal conditions at the surface, and groundwater levels are not necessarily reflected. Precipitation data taken ≥ 3 months before the observation should be evaluated to determine if preceding dry conditions have potentially impacted current groundwater tables (e.g., lag times in the recovery of groundwater tables and discharge)

d) Provide hydrograph showing well data (see example at end of document). *This should include ground elevation on the Y axis, with the ground surface and 12 inches below ground surface clearly marked. The X axis should be time.* The data should include well water levels and precipitation over that period. The hydrograph should also clearly mark the beginning and end of the growing season and should highlight the periods of time where the hydrology criteria was met.

e) Summarize results of the hydrology monitoring for each well, by cell, and for the entire site, including if each meets/does not meet the performance standards. Estimate percent of site that has wetland hydrology.

3. Soils:

a) Monitoring data to determine if hydric soils are actively developing. Data should be included for each sample location. This must include evidence that saturated and anaerobic soil conditions are being met, as measured by alpha-alpha dipyridyl, IRIS devices (tubes or films), or platinum electrodes.

b) For the first monitoring report, include monitoring data to determine if at least 2% organic matter is present in the entire depth of topsoil. Data should be included for each sample location.

c) For the first monitoring report, include monitoring data to determine the bulk density of the subsoil. Data should be included for each sample location.

d) Provide a soil profile description with accompanying soil photos for each soil location tested above.

e) Summarize results of the soil monitoring for each sample location, by cell, and for the entire site, including if each meets/does not meet the performance standards.

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14 https://github.com/jDeters-USACE/Antecedent-Precipitation-Tool/releases/latest

15 https://www.wcc.nrcs.usda.gov/climate/wets_doc.html

16 https://www.ncdc.noaa.gov/temp-and-precip/drought/nadm/indices

17 https://www.weather.gov/marfc/Precipitation_Departures#

18 https://www.wcc.nrcs.usda.gov/

4. **Physical Structure:**
   a) Estimate percentage of site with microtography and compare with approved Mitigation Plan.
   b) Estimate density and type of coarse woody debris (e.g., logs, brush piles, root wads, overturned stumps, standing snags, etc.) and compare with approved Mitigation Plan.

5. **Wetland function assessment:** Provide an assessment of the specific wetland functions and values being provided at the mitigation site.

B. Buffer Area(s):

1. **Vegetation:**
   a) Estimate the actual and relative percent cover by plant species across all strata for each plot. Include this information in a table. For each species listed in the table, include native/non-native status. Summarize the data by plot, cell, and overall site. The presence, location, and percent cover of colonies of invasive and/or non-native species shall be mapped on the mitigation plan.
   b) For scrub-shrub or forested buffers, estimate the percent survival of trees and the number of native trees/shrubs per acre (including planted or volunteer woody species at least ten inches). Data should be summarized for each plot and by cell and overall site. Please note that projects where the vegetation is inconsistent throughout the site may not meet the performance standards (e.g., a site where some portions have high densities of woody species, but other portions have low densities).
   c) For scrub-shrub or forested buffers, measure the height of the tallest five trees within each sample plot in each monitoring year. In the final year of monitoring, measure canopy cover of native trees and shrubs.
   d) Measurements of vegetation based upon performance standard and methods used to evaluate the vegetative success of the mitigation site. **Do not include the raw plot data in your monitoring report.**

C. Remediation:

1. Describe any problems observed within the wetland or buffer, such as: excessive inundation, insufficient hydrology, seasonal drought conditions, invasion by undesirable species of plants or wildlife, disease condition for plants, poor plant establishment, human encroachment, adverse water quality impacts (e.g., excessive sediment loading, water pollution, etc.) and slope failures or erosion problems.
2. Describe the proposed remedial measures to address the problems noted above. Note: even if some performance standards are met when summarizing across a cell (e.g., tree density), if some plots are not meeting the performance standards, remediation should be proposed for the area represented by the failing plot. Additionally, a site walk may help to identify other issues not captured in the plot data, which should still be remediated.
3. Remedial measures proposed by the Sponsor are subject to review and approval by the IRT, acting through the co-chairs, prior to implementation. Remediation should be completed within a year of identifying the deficiency. In the event that remedial measures are implemented, the monitoring period may be extended on a case-by-case basis. The treatment of non-native invasive plant species does not need the approval of IRT but should be completed at the correct time of year by someone with a current pesticide applicator certification and the required MDE toxic materials permit.

V. Adaptive Management Review

A. The Sponsor assumes all liability for performing approved measures through adaptive management strategies or alternative mitigation should IRT or the Sponsor determine the site is not meeting performance standards or satisfying the objectives of the approved mitigation plan or instrument. The approved adaptive management plan will guide decisions for revising mitigation plans and implementing measures to address circumstances (foreseeable and unforeseen) that adversely affect mitigation site success. Any deviations from the approved mitigation plan requires approval from the co-chairs, in consultation with the IRT.

B. The Sponsor must include appropriate information in the monitoring reports about performance issues and implementation of approved adaptive management measures to allow the IRT to assess how the project is progressing. The Sponsor must notify the co-chairs as soon as possible if the site is not achieving its performance standards as anticipated. The co-chairs, in coordination with the IRT and Sponsor, will evaluate any deficiencies and determine if proposed measures will address those deficiencies and/or require modification of the approved mitigation plan(s). The proposed measures must be designed to ensure that the modified mitigation project provides aquatic resource functions comparable to those described in the mitigation plan objectives. The Sponsor shall implement the strategies in the adaptive management plan until the site has been determined by the IRT to have met its goals, objectives, and performance standards and the long-term management plan is initiated.

STANDARD METHODS FOR MONITORING VEGETATION, HYDROLOGY, AND SOILS IN WETLAND MITIGATION SITES IN MARYLAND

Below are the recommended techniques for monitoring mitigation sites. Alternate techniques may be considered, but must be approved in writing by the co-chairs, in consultation with the IRT, prior to the commencement of the monitoring period.

Recommended Wetland Vegetation Density Measurement Technique

a. The following method for measuring the success of the vegetative colonization should be conducted once between May 1 and September 30 for forested/shrub-shrub systems and between June 15 and September 30 for emergent systems during each year requiring submittal of a monitoring report, unless an alternate schedule is agreed upon by the co-chairs, in consultation with the IRT.
b. Vegetation sample plots shall be located on a stratified random basis over the site to sample all areas of wetlands at locations adjacent to each photo location marker. Plots should be located within each planned and actual vegetative type and hydrologic regime. Plot locations should be determined prior to construction and shown on the mitigation plan. Once the sample plots are approved as part of the mitigation plan, they should be stationary, unless the Sponsor recommends, and the co-chairs, in consultation with the IRT, agree to moving the permanent plot location. In conjunction with the permanent plots established within the rehabilitated, enhanced, reestablished, and/or established wetlands, additional wetland vegetative monitoring plots will be randomly selected every monitoring year during the maintenance and monitoring phase of the mitigation site. A minimum of half the plot locations will be permanent and the remaining half will be randomly selected every monitoring year. Alternatively, the IRT may also recommend the relocation of some or all the sample plots to better reflect the plant communities. Potential justification for moving sample plots may include that the plot location is an outlier, or the actual vegetative type/hydrologic regime differs from what was planned, resulting in some representative areas not being monitored. The following minimum numbers of samples will be required:
    i. If the site is < 5 acres, then a minimum of 3 plots/acre is necessary.
    ii. If the site is > 5 acres but less than 20 acres, then a minimum of 3 plots/acre is required for the first 5 acres, then 2 plots/acre is required for the remaining acreage.
    iii. If the site is > 20 acres, then a minimum of 2 plots/acre is required for the first 20 acres, then 1 plot/acre is required for the remaining acreage.
    iv. All cells shall be sampled. A targeted vegetation monitoring approach that correlates monitoring stations with vegetative signatures on aerial photography may be useful for larger mitigation sites.
c. Each plot shall be of a size no less than 400 square feet for woody plants and 3'x3' for herbaceous plants (or circular with approximately the same surface area). The vegetation data shall be collected during the growing season and shall include:
    i. Dominant vegetative species identification
    ii. Percent ground cover assessment
    iii. Number of woody plant stems greater than 10 inches in height (total and #/acre)
    iv. The percentage of dominant species FAC or wetter
    v. Percent survival by planted species
    vi. A non-native/invasive species assessment including percent cover

Recommended Buffer Vegetation Density Measurement Technique

a. The following method for measuring the success of the vegetative colonization should be conducted

once between May 1 and September 30 of each year requiring submittal of a monitoring report, unless an alternate schedule is agreed upon by the co-chairs, in consultation with the IRT.

b. Vegetation sample plots shall be located on a stratified random basis over the site to sample all areas of wetland buffer at locations adjacent to each photo location marker. Plots should be located within each planned and actual vegetative type and hydrologic regime. Plot locations should be determined prior to construction and shown on the mitigation plan. Once the sample plots are approved as part of the mitigation plan, they should be stationary, unless the Sponsor recommends, and the co-chairs, in consultation with the IRT, agree to moving the permanent sample plots. In conjunction with the permanent plots established within the rehabilitated, reestablished, and/or established wetlands, additional wetland vegetative monitoring plots will be randomly selected every monitoring year during the maintenance and monitoring phase of the mitigation site. A minimum of half the plot locations will be permanent and the remaining half will be randomly selected every monitoring year. Alternatively, the IRT may also recommend the relocation of some or all the sample plots to better reflect the plant communities. Potential justification for moving sample plots may include that the plot location is an outlier, or the actual vegetative type differs from what was planned, resulting in some representative areas not being monitored. The following minimum numbers of samples will be required:
    i. If the site is < 5 acres, then a minimum of 3 plots/acre is necessary.
    ii. If the site is > 5 acres but less than 20 acres, then a minimum of 3 plots/acre is required for the first 5 acres, then 2 plots/acre is required for the remaining acreage.
    iii. If the site is > 20 acres, then a minimum of 2 plots/acre is required for the first 20 acres, then 1 plot/acre is required for the remaining acreage.
    iv. All cells shall be sampled. A targeted vegetation monitoring approach that correlates monitoring stations with vegetative signatures on aerial photography may be useful for larger mitigation sites.

c. Each plot shall be of a size no less than 400 square feet for woody plants (or circular with approximately the same surface area). The vegetation data shall be collected during the growing season and shall include:
    i. Total actual and relative percent cover of native plant species.
    ii. Number of native woody plant stems greater than 10 inches in height (total and #/acre).
    iii. A non-native/invasive species assessment including relative percent cover.

<u>Recommended Groundwater Well Placement and Data Collection</u>

a. Determine if this wetland is groundwater fed or has a perched water table. Soil profile descriptions must be assessed prior to well installation to identify any restrictive layers to downward water movement. Wells should be installed following the techniques described in the 2005 Corps document entitled *Technical Standard for Water-Table Monitoring of Potential Wetland Sites ERDC TN-WRAP-05-02*. They should not penetrate the restrictive layer but should instead be no deeper than the top of the restrictive layer. In most cases, a standard monitoring well installed to 15 inches below the soil surface should be used. Shallower installation depths should be utilized if restrictive soil depths are located within 15 inches of the soil surface. Well design and installation shall be consistent with current Corps' guidance.

b. Specific details on the groundwater monitoring wells and locations shall be provided in the mitigation plan, and must be approved by the co-chairs, in consultation with the IRT.

c. The following minimum numbers of groundwater wells will generally be required. The Sponsor may propose alternate well requirements as part of the mitigation plan, based on justification from the proposed mitigation design:
    i. If the site is < 10 acres, then a minimum of 1 well/acre is necessary.
    ii. If the site is 10 to 20 acres, then a minimum of 1 well/acre is necessary for the first 10 acres, then 1 well/2 acres is necessary for the remaining acreage.

iii. If the site is > 20 acres, then a minimum of 1 well/acre is necessary for the first 10 acres, 1 well/2 acres is necessary for the next 10 acres, and 1 well/5 acres is necessary for the remaining acreage.
iv. Hydrologic zones differentiated by a 1-foot change in elevation should have a minimum of one groundwater monitoring well installed.
v. For sites with multiple cells, each cell should have at least one well.

d. Begin the collection of groundwater well data within fourteen days of the start of the growing season. Take groundwater well readings once every 7 days for the first two months of the growing season and every 30 days for the remainder of the growing season. Data loggers are highly recommended, as they provide a continuous recording of water levels. Record to the nearest inch. Well data should be collected every year during the monitoring period in included in the monitoring report. If well data confirms the presence of wetland hydrology during multiple years of monitoring, the Sponsor may request that well data not be required every year. The co-chairs, in consultation with the IRT, will consider the evidence of hydrology, based on the monitoring reports, site visits, and local precipitation, to approve or deny this request.
e. The growing season should be based on median dates (i.e., 50 percent probability) of 28ºF air temperatures in spring and fall, based on the long-term data for the nearest appropriate weather station, as recorded in the WETS tables available from the NRCS National Water and Climate Center (https://www.wcc.nrcs.usda.gov/climate/navigate_wets.html), or as specified in the appropriate regional supplement to the Corps of Engineers Wetland Delineation Manual.
f. Measure and record any surface water present at the monitoring wells.
g. Include a copy of the plan showing the location of the wells and surface elevation beside each well. Summarize the information regarding groundwater and surface water elevations and provide monthly rainfall data for the areas.

Indicator of Saturated and Anaerobic Conditions to Demonstrate the Presence of Active Hydric Soil Conditions

a. The Hydric Soil Technical Standard (HSTS) developed by the National Technical Committee for Hydric Soils (Technical Note 11) requires documentation of anaerobic conditions and saturated conditions for a soil to be considered hydric:
    i. For a soil to meet the Saturated Conditions part of the HSTS, free water must exist within 10 inches (25 cm) of the ground surface for at least 14 consecutive days; and
    ii. Anaerobic conditions must exist within 10 inches (25 cm) of the ground surface for at least 14 consecutive days. Anaerobic conditions may be determined by one of the following methods, as detailed in the HSTS:
        (1) Positive reaction to alpha-alpha-dipyridyl, determined at least weekly.
        (2) Reduction of iron determined with IRIS devices (tubes or films) installed for 30 days.
        (3) Measurement of redox potential (Eh) using platinum electrodes, determined at least weekly.

    Methods to demonstrate the presence of anaerobic conditions are outlined at (https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051608.pdf).
b. If using alpha-alpha dipyridyl to show soil reduction, soils should be measured at least weekly during the growing season, at a depth of six inches. Note that alpha-alpha dipyridyl is also available as paper strips for easier measurement.
b. Soil testing should be conducted during the time of the growing season anticipated to have the highest amount of soil reduction (often in the early growing season).
c. Samples should be taken in a representative portion of the mitigation site with similar micro topography, vegetative community, etc., rather than in the lowest/wettest areas. Some samples should

also include the areas with higher elevations. Additional tests should be taken for larger sites and sites with higher changes in elevation.

d. Plot locations shall be determined after baseline hydrology data are collected for at least one growing season to select areas that represent various hydroperiods. At least one soil sample plot location should be established for each hydroperiod present at the mitigation site. Soil sample plots shall be located within five feet of the monitoring well and shall be performed during each monitoring year. Additional soil monitoring plots may need to be established where saturation occurs between 5% and 12.5% of the growing season to provide corroborative evidence that wetland hydrology is present. Additional soil monitoring may also be required if soil monitoring occurs during extremely wet or dry years.

d. Include a copy of the plan showing the location of the soil data collection, summarize the information, and provide monthly rainfall data for the area.

e. If soil testing confirms the presence of actively reducing soil conditions during at least three years or 50% of monitoring, whichever is greater, the Sponsor may request that soil testing not be required every year. The co-chairs, in consultation with the IRT, will consider the evidence of anaerobic soil conditions, based on the monitoring reports, site visits, and local precipitation, to approve or deny this request.

<u>Recommended Method of Indicator of Reduction in Soils (IRIS) Film Placement and Data Collection</u>.

a. Label Fe-coated films.
b. Roll one Fe-coated film into 1" clear polycarbonate delivery tube, with Fe-coating facing out.
c. Create a pilot hole in the soil using a 1" push probe. The hole should be slightly deeper (1-2") than final depth of film.
d. Insert rod into the delivery tube, being sure to hook the rod into the hole at the bottom of the film.
e. Insert the "loaded" delivery tube into the hole until the mark on the tube is at the soil surface (50 cm).
f. Holding the rod to ensure the film stays in the soil, pull out the delivery tube.
g. Pull out the rod, being careful not to pull out the film.
h. Insert foam plug into the top of the film, using two O-rings to secure the film around the plug.
i. If the films are installed to shallower depths (e.g., gravel layer inhibits full depth for pilot hole), mark the depth of the soil surface on the films with a permanent marker.
j. Install five replicates, up to a meter apart, within the study area.
k. Films should be left in place for two to four weeks and then should be removed and replacement films can be installed in the same holes for an additional two to four weeks. **Films left in for longer than four weeks cannot be used to meet required performance standards.**
l. Gently wash off any adhering soil from the films.
m. Estimate the amount of paint removed from each film by overlaying with a mylar grid and marking and counting the grid[19], or by using some other IRT-approved procedure.
n. Find a six-inch area on the film, entirely within the upper 12 inches, with the most paint removed. Estimate the percentage of paint removed from this six-inch area and document the depth of this six-inch area.
o. To meet the Technical Standard for reducing soil conditions as currently specified in the National Technical Committee on Hydric Soils, 30% or more of paint within this six-inch section must be removed.
p. At least three of the five replicates must show this paint removal for the soil to demonstrate that it is reducing.

[19] Rabenhorst, M.C. 2012. Simple and Reliable Approach for Quantifying IRIS Tube Data. Soil Sci. Soc. Am. J. 76: 307-308.

Recommended Method of Indicator of Reduction in Soils (IRIS) Tube Placement and Data Collection (summarized from the 2008 document entitled *Protocol for Using and Interpreting IRIS Tubes*).

a. Create a pilot hole in the soil using a 7/8" push probe. The hole should be slightly deeper (1-2") than final depth of tube.
b. Be sure tubes are labeled.
c. Insert the IRIS tube into the hole until the mark on the tube is at the soil surface (50 cm). If they are installed to shallower depths, mark the depth of the soil surface with a permanent marker.
d. Install five replicates, up to a meter apart, within the study area.
e. Tubes should be left in place for two to four weeks and then should be removed and replacement tubes can be installed in the same holes for an additional two to four weeks. **Tubes left in for longer than four weeks cannot be used to meet required performance standards**.
f. Gently wash off any adhering soil from the tubes.
g. Estimate the amount of paint removed from each tube by wrapping a mylar grid around tube and by marking and counting the grid, or by using some other IRT-accepted procedure.
h. If visual estimations are used, to improve accuracy, have two (or more) people estimate the amount of paint removed, then average the two sets of data.
i. Find a six-inch area on the tube, entirely within the upper 12 inches, with the most paint removed. Estimate the percentage of paint removed from this six-inch area and document the depth of this six-inch area.
j. To meet the Technical Standard for reducing soil conditions as currently specified in the National Technical Committee on Hydric Soils, 30% or more of paint within this six-inch section must be removed.
k. At least three of the five replicates must show this paint removal for the soil to demonstrate that it is reducing.

Recommended Method of Application of the Alpha-Alpha Dipyridyl Paper Test Strips

a. To meet the anaerobic condition requirement using alpha-alpha dipyridyl test strips, tests should show positive reaction to alpha-alpha dipyridyl at least three times in a row (e.g., sample on Day 1, sample a week later, sample another week later).
b. Excavate a soil pit to a depth of at least 14-16 inches*. A fresh slice of the profile should be cut from the side of the pit and laid out for observation and characterization. Apply the test strips to the targeted layer(s) at several locations within the representative area to ensure that the majority of the layer is reduced. Document at what depth the positive reaction(s) to the test occurred. The procedure for problematic soils (Step 4d) discussed in Chapter 5 of the Regional Supplements requires that **at least 60% of a layer 4 inches or more thick and located within 12 inches of the surface**, react positively from liquid alpha-alpha dipyridyl solution. **Note: The depth of soil excavations for profile characterization can be much deeper depending upon the required depth and thickness requirements of some hydric soil indicators.*
c. It is important that the test strips are applied only to a fresh, broken face of the desired layer(s). Do not add moisture to soil samples or rub soil against or on to the paper, simply press the paper against a fresh, broken ped face on the soil sample(s). Be sure not to test soil samples that have been exposed to digging equipment to prevent false positive reactions. Record all observations of soil moisture, limit of saturation and the depth to water table on a data form and or in your notes.
d. A positive reaction on the paper (turning pink or red) should occur in a few moments but can take longer especially during colder periods. The manufacturer indicates that the reaction normally takes place within about 30 seconds.

e. To increase the validity of your findings, test the targeted layers at several different locations within the same representative area and any other layers which meet an indicator.
f. Testing multiple samples can exhaust your supply quickly but you can double your reserves by cutting the strips in half. Be careful not to use cutting instruments that could contaminate a sample.
g. The test should be performed as soon as you remove the sample and all information (depths, layers, etc.) recorded in the appropriate fields of the data form (i.e., hydrology remarks, soil layer comments, soil remarks, etc.). Your soil profile description should also be performed as soon as possible using one of the representative pits. In addition to photo documenting your soil profile, document the application of the strips before and after any potential reaction.
h. If the soil is allowed to dry before implementing the test strips or characterization of the profile, dig another representative pit and start over.

Recommended Method for Evaluating Organic Matter in the Topsoil

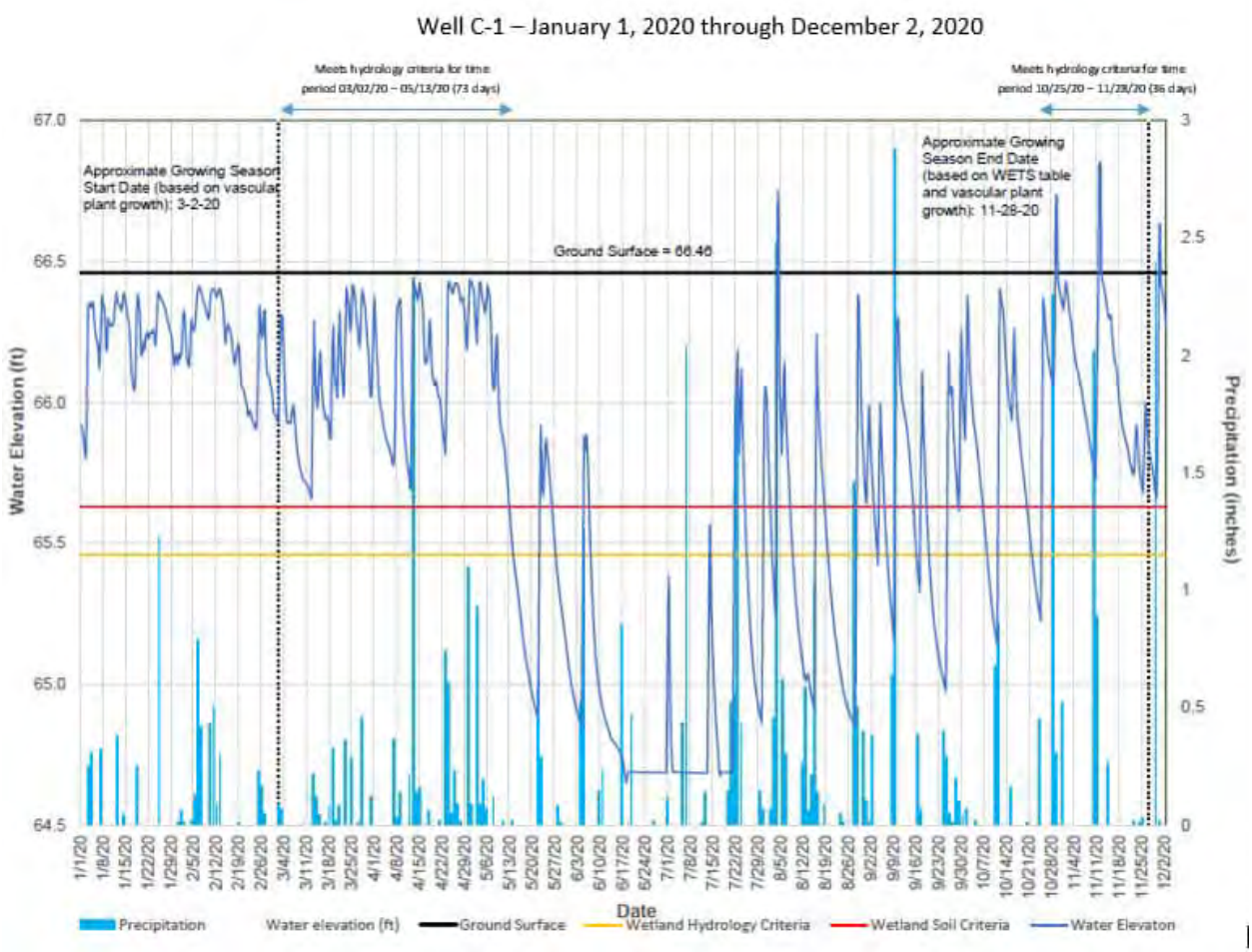
a. Topsoil organic matter should be evaluated at multiple representative locations through the mitigation site after construction is complete or during the first monitoring year. A sample should be taken near each monitoring well. Locations of topsoil organic matter samples should be shown on the monitoring plans.
b. Data should be included for each sample location. Data should include a soil profile description to a depth of at least 12 inches for each sample location with all information in the Soil Profile Description table of the Wetland Determination Data Form.
c. If the entire top 6 inches (or depth of topsoil required in the approved mitigation plans if different than 6 inches) has a Munsell value <u>and</u> chroma ≤ 3, then soil organic matter does not need to be tested in the laboratory. If it has a Munsell value or chroma >3, then the soil organic matter must be tested using the Walkley-Black or Loss on Ignition method.
d. Soil tests must be completed at a soil testing laboratory listed on the University of Maryland Extension website. Soil samples must follow instructions from the soil testing lab.
e. Remove leaves or debris from the top of the soil. Collect a core soil sample that is a depth of 6 inches (sampling the top 0-6 inches). Put this sample in a clean bucket and mix well. Fill the soil sample bag with the amount specified by the soil testing lab. Soil samples from different locations on the site should not be mixed together but should be clearly labeled.
f. To convert total organic carbon to organic matter, use this formula: total organic C (%) * 1.72 = OM (%).

<u>Recommended Method for Testing Subsoil Bulk Density</u>

g. Bulk density should be tested at multiple representative locations through the mitigation site after construction is complete or during the first monitoring year. A sample should be taken near each monitoring well. Locations of bulk density samples should be shown on the monitoring plans.
h. The bulk density sample should be extracted soon after the topsoil has been replaced.
i. Topsoil should be carefully removed. Samples should be taken immediately below the topsoil. The sample should represent only one soil horizon and be a minimum thickness of four inches.
j. Extract a known volume of soil. This can be done by driving in an open-ended can or ring (e.g., 3-inch diameter) into the soil to extract a set volume. The thickness should be a minimum of 4 inches. The volume of the ring must be calculated. Using a mallet or similar tool, drive the ring into the subsoil to the depth of the ring. Make sure the top surface of the ring is level with the subsoil surface. Dig around the ring. With a trowel underneath, carefully extract the ring to prevent soil loss. Remove any excess soil from the sides, top, and bottom of the sample with a flat-bladed knife. The bottom and top of the sample should be flat with the edges of the ring.

k. Using a flat-bladed knife, push out the soil sample into a plastic sealable bag. Place the entire soil sample into the sealed bag. Soil samples from different location on the site should not be mixed together but should be clearly labeled.
l. Dry the sample in a microwave at full power for two or more four-minute periods, allowing venting between cycles.
m. Weigh the sample. To verify that the soil is totally dry, heat the sample in the microwave again and reweigh. Continue until the sample weight does not change.
n. Weigh an empty plastic bag and remove this weight from the sample weight.
o. Calculate the bulk density as follows:

$$\text{Soil bulk density (g/cc)} = \frac{\text{oven dry weight of soil}}{\text{volume of soil}}$$

Note: for more details on this method or if the soil is gravelly or rocky, please follow the Cylindrical Core Method described in the July 2001 U.S. Department of Agriculture Service's document Soil Quality Test Kit Guide, Section I, Chapter 4, pp. 9-13.

Example Hydrograph