OP•LANES™
MARYLAND

I-495 & I-270 Managed Lanes Study

WATER QUALITY CERTIFICATION REQUEST

July 2022

U.S. Department of Transportation
Federal Highway Administration

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

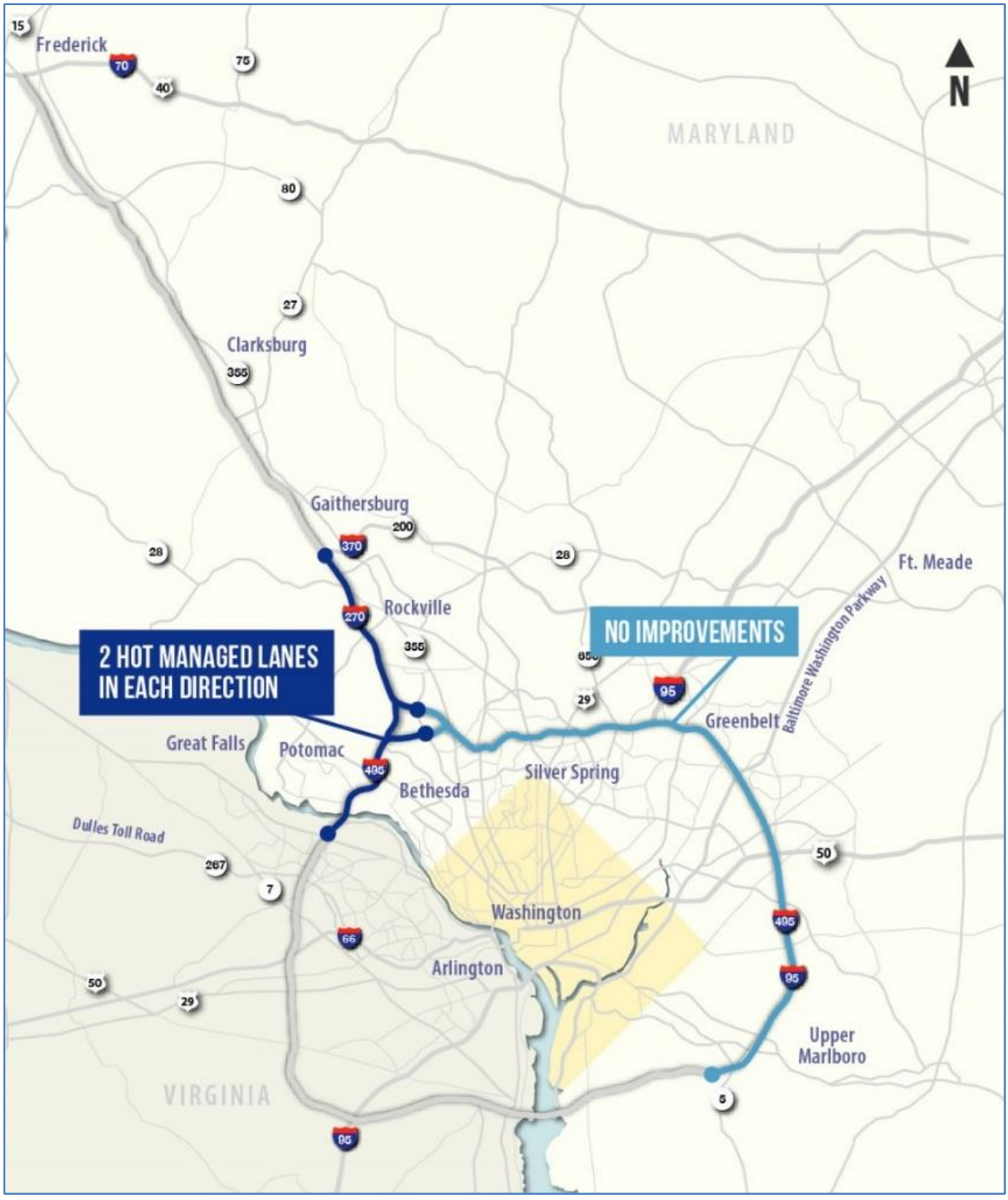
1 INTRODUCTION

The Federal Highway Administration (FHWA), as the Lead Federal Agency, and the Maryland Department of Transportation State Highway Administration (MDOT SHA), as the Local Project Sponsor, are preparing a *Final Environmental Impact Statement* (FEIS) in accordance with the National Environmental Policy Act (NEPA) for the I-495 & I-270 Managed Lanes Study (MLS). The MLS is the first environmental study under the broader I-495 & I-270 Public-Private Partnership (P3) Program. MDOT SHA is proposing the MLS to provide a travel demand management solution(s) that addresses congestion and improves trip reliability on I-495 and I-270 within the project area and enhances existing and planned multimodal mobility and connectivity.

On May 3, 2022, MDOT SHA submitted an amended Joint Federal/State Application (JPA) and supporting documentation for the Alteration of Any Floodplain, Waterway, Tidal or Nontidal Wetland within the Limits of Disturbance (LOD) of the Build Alternatives of the entire I-495 & I-270 MLS project [U.S. Army Corps of Engineers Application Number NAB-2018-02152 (MDOT SHA/I-495 I-270 Managed Lane Study) and Maryland Department of the Environment, Nontidal Wetlands and Waterways Tracking Numbers 20-NT-0114 / 202060649 / AI 168251]. The application was submitted pursuant to the requirements of the Code of Maryland Regulations, Sections 26.17 and 26.23, and Section 404 of the Clean Water Act (CWA) and supported by the publicly available MLS *Draft Environmental Impact Statement* (DEIS; FHWA and SHA 2020). The JPA amendment includes the Preferred Alternative (PA), Alternative 9 - Phase 1 South, as MDOT SHA is currently only proceeding with that portion of the project. The PA, also referred to as Alternative 9 – Phase 1 South, includes building a new American Legion Bridge and delivering two high-occupancy toll (HOT) managed lanes in each direction on I-495 from the George Washington Memorial Parkway in Virginia to east of MD 187 on I-495, and on I-270 from I-495 to north of I-370 and on the I-270 eastern spur from east of MD 187 to I-270 (**Figure 1**). The PA includes construction activities that would result in unavoidable impacts to wetlands and waterways, including roadway widening and reconfiguration, additional drainage improvements, staging and stockpiling areas, construction access areas, culvert extension and augmentation, outfall stabilization, bridge replacement, on- and off-site stormwater management (SWM),non-tidal wetlands and waterways mitigation, and park mitigation. This PA was identified after extensive coordination with agencies, the public, and stakeholders to respond directly to feedback received on the FEIS (FHWA and SHA 2022) to avoid displacements and impacts to significant environmental resources, and to align the NEPA approval with the planned project phased delivery and permitting approach.

Pursuant to Section 401 of the CWA, MDOT SHA is requesting a Water Quality Certification for Phase 1 South. Because a separate Water Quality Certification is being requested from the Virginia Department of Environmental Quality for the portion of Phase 1 South within their jurisdiction, this request is only for the Maryland portion of Phase 1 South. As required by 40 C.F.R. § 121.5 and Code of Maryland Regulations (COMAR) 26.08.02.10, the summary below includes project-specific information for the key elements needed to request a Water Quality Certification in Maryland. Some of the specific details in this document regarding the current design (e.g., stormwater management, culverts) are subject to change as project designs are refined over the course of the design process, but any mitigation required will be provided by final design.

Figure 1: Vicinity Map for Phase 1 South of I-495 & I-270 Managed Lanes Study



2 KEY ELEMENTS FOR A CWA SECTION 401 WATER QUALITY CERTIFICATION

In accordance with 40 C.F.R. § 121.5 and COMAR 26.08.02.10, MDOT SHA is providing the following general project information for this Water Quality Certificate Request.

2.1 Project Proponent and a Point of Contact

Applicant:
Maryland Department of Transportation
State Highway Administration
Attn: Jeffrey T. Folden, P.E., DBIA
707 North Calvert Street
Mail Stop P-601
Baltimore, MD 21202
(410) 545-8814
495-270-P3@sha.state.md.us

Authorized Agent:
Maryland Department of Transportation
State Highway Administration
Attn: Caryn Brookman
601 N. Calvert Street
Baltimore, MD 21202
(410) 637-3335
Cbrookman.consultant@mdot.maryland.gov

2.2 Applicable Federal License or Permit

U.S. Army Corps of Engineers Application Number NAB-2018-02152 (MDOT SHA/I-495 I-270 Managed Lane Study) and Maryland Department of the Environment, Nontidal Wetlands and Waterways Tracking Numbers 20-NT-0114 / 202060649 / AI 168251. The JPA amendment was submitted on May 3, 2022.

2.3 Project Location and Watershed Information

Due to the linear nature of the project, there is no specific project site address. The coordinates for the centroid of Phase 1 South are 39° 02' 35.80777", -77° 09' 52.15340. A list of watersheds crossed by Phase 1 South, including drainage areas and designated uses, is included in **Table 1**, below. A list of watersheds containing proposed off-site compensatory stormwater quality treatment is included in **Table 2,** below, along with the drainage areas and designated uses. **Tables 3 and 4** include the watersheds containing the proposed nontidal wetlands and waterways compensatory mitigation and park mitigation, respectively, with drainage areas and designated uses.

Table 1. Summary of Watersheds and Designated Uses within Phase 1 South

MDE Watershed			USGS 12-digit HUC Name (Number)	Drainage Area (Square Miles)	Designated Use[1]
6-digit Name (Number)	8-digit Name (Number)	12-digit Number			
Potomac River – Washington Metropolitan (021402)	Potomac River – Montgomery County (02140202)	021402020845	Nichols Run-Potomac River (020700081003)	15	I-P
		021402020846	Watts Branch (20700081002)	22	I-P
		021402020848	Muddy Branch (20700081001)	20	I-P
	Cabin John Creek (02140207)	021402070841	Cabin John Creek (020700081003)	26	I-P
	Rock Creek (02140206)	021402060836	Lower Rock Creek (020700100102)	18	I

[1]List of designated uses includes waterways receiving drainage directly from proposed Phase 1 South project activities and not all designated uses that occur within the watershed.

Table 2. Summary of Watersheds and Designated Uses for Proposed Off-site Compensatory Stormwater Quality Treatment Sites

MDE Watershed			USGS 12-digit HUC Name (Number)	Drainage Area (Square Miles)	Designated Use[1]
6-digit Name (Number)	8-digit Name (Number)	12-digit Number			
Potomac River – Washington Metropolitan (021402)	Potomac River – Montgomery County (02140202)	021402020844	Nichols Run-Potomac River (020700081005)	10	I-P
		021402020845	Nichols Run-Potomac River (020700081005)	14	I-P
		021402020846	Watts Branch (020700081002)	22	I-P
		021402020847	Nichols Run-Potomac River (020700081005)	4	III-P
		021402020848	Muddy Branch (020700081001)	20	I-P, III-P
		021402020849	Selden Island-Potomac River (020700080904)	9	I-P
	Cabin John Creek (02140207)	021402070841	Cabin John Creek (020700081003)	26	I-P

MDE Watershed			USGS 12-digit HUC Name (Number)	Drainage Area (Square Miles)	Designated Use[1]
6-digit Name (Number)	8-digit Name (Number)	12-digit Number			
	Rock Creek (02140206)	021402060831	Lower Rock Creek (020700100102)	18	I
		021402060836	Lower Rock Creek (020700100102)	18	I
		021402060837	Upper Rock Creek (020700100101)	16	I, IV
		021402060838	Lower Rock Creek (020700100102)	12	III, IV
		021402060839	Upper Rock Creek (020700100101)	4	IV
		021402060840	Upper Rock Creek (020700100101)	8	III

[1]List of designated uses includes waterways receiving drainage directly from proposed off-site stormwater quality treatment sites and not all designated uses that occur within the watershed.

Table 3. Summary of Watersheds and Designated Uses for Proposed Off-site Nontidal Wetlands and Waterways Compensatory Mitigation Sites

MDE Watershed			USGS 12-digit HUC Name (Number)	Drainage Area (Square Miles)	Designated Use[1]
6-digit Name (Number)	8-digit Name (Number)	12-digit Number			
Potomac River – Washington Metropolitan (021402)	Seneca Creek (02140208)	021402080857	Great Seneca Creek (020700080802)	14	I-P
		021402080863	Great Seneca Creek (020700080802)	5	I-P

[1]List of designated uses includes waterways receiving drainage directly from proposed off-site mitigation sites and not all designated uses that occur within the watershed.

Table 4. Summary of Watersheds and Designated Uses for Proposed Park Mitigation

MDE Watershed			USGS 12-digit HUC Name (Number)	Drainage Area (Square Miles)	Designated Use[1]
6-digit Name (Number)	8-digit Name (Number)	12-digit Number			
Potomac River – Washington Metropolitan (021402)	Cabin John Creek (02140207)	021402070841	Cabin John Creek - (020700081003)	26	I-P
	Potomac River – Montgomery County - (02140202)	021402020845	Nichols Run-Potomac River (020700081005)	14	I-P

[1]List of designated uses includes waterways receiving drainage directly from proposed park mitigation sites and not all designated uses that occur within the watershed.

2.4 Names and Addresses of Adjacent Property Owners.

The names and addresses of adjacent property owners are included in **Appendix A**.

2.5 Signed Public Notice Billing Form

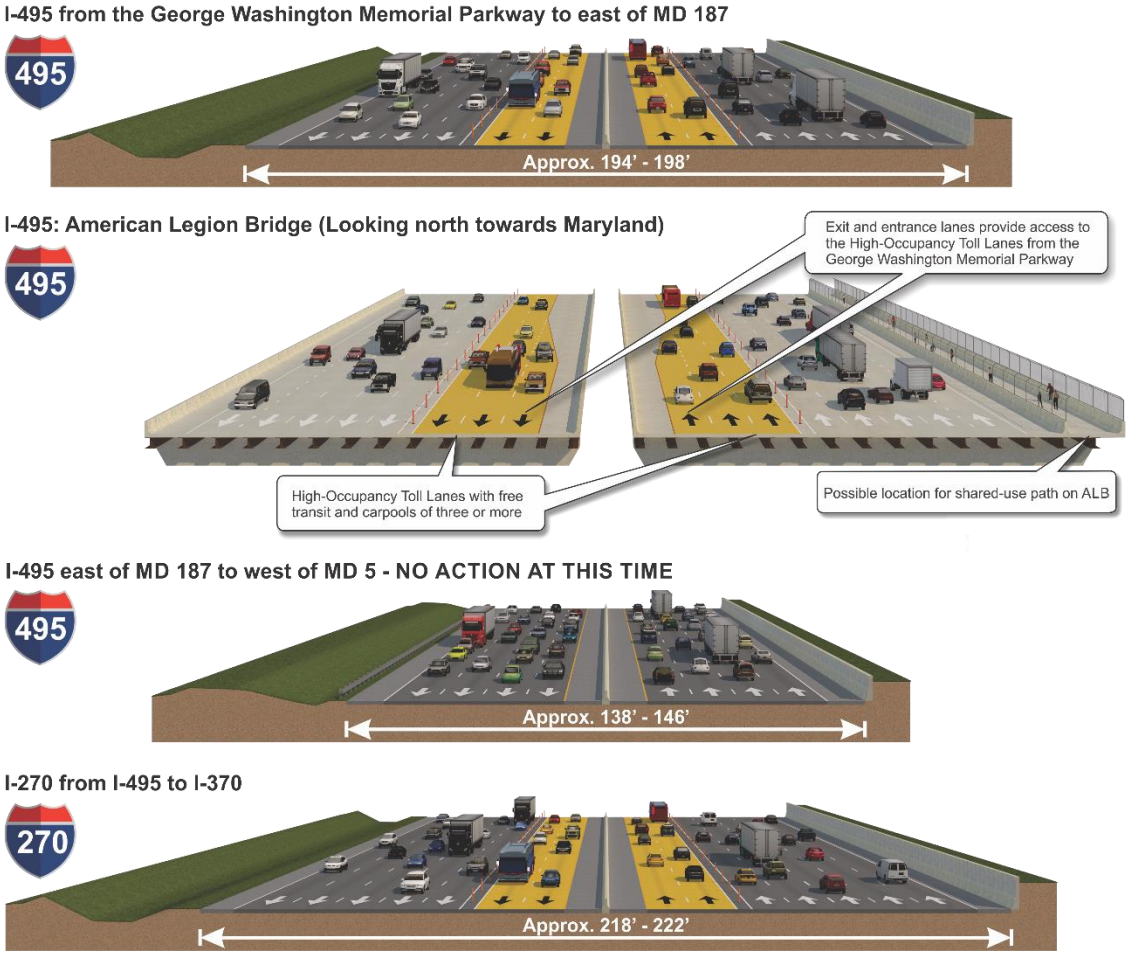
A signed Public Notice Billing Form is included in **Appendix B**.

2.6 Description of the Facility or Activity

The purpose of the Phase 1 South project is to develop a travel demand management solution(s) that addresses congestion and improves trip reliability on I-495 and I-270 within the project area and enhances existing and planned multimodal mobility and connectivity. The PA includes a two-lane HOT managed lanes network on I-495 and I-270 within the limits of Phase 1 South only (**Figure 2**).

On I-495, the PA consists of adding two, new HOT managed lanes in each direction from the George Washington Memorial Parkway to east of MD 187. On I-270, the PA consists of converting the one existing HOV lane in each direction to a HOT managed lane and adding one new HOT managed lane in each direction on I-270 from I-495 to north of I-370 and on the I-270 east and west spurs. There is no action, or no improvements included at this time on I-495 east of the I-270 east spur to MD 5. Along I-270, the existing collector-distributor (C-D) lanes from Montrose Road to I-370 would be removed as part of the proposed improvements. The managed lanes would be separated from the general-purpose lanes using pylons placed within a four-foot-wide buffer. Transit buses and HOV 3+ vehicles would be permitted to use the managed lanes toll-free.

Figure 2: Preferred Alternative Typical Sections (HOT Managed lanes Shown in Yellow)



The LOD for Phase 1 South includes all construction, construction access, staging, materials storage, grading, clearing, erosion and sediment control, landscaping, noise barrier replacement/construction, drainage, on- and off-site SWM, park mitigation, and related activities. The concept design for on-site SWM, including but not limited to bioswales, grass swales, submerged gravel wetlands, micro-bioretentions, bioretentions, ponds, and underground facilities along the roadside and within interchanges is included within the LOD. All determinations of minimum SWM criteria for this project are preliminary. Full SWM design will be completed in later stages of the project and any mitigation required will be provided by final design. The LOD also includes all proposed off-site compensatory stormwater quality treatment sites and nontidal wetlands and waterways compensatory mitigation sites.

Based on the direct and indirect impacts to wetlands and waterways associated with the Phase 1 South LOD, two permittee-responsible mitigation sites and credit purchases from one mitigation bank are proposed. The permittee-responsible mitigation sites will provide 4.61 acres of wetland mitigation credit and 6,304 functional feet of stream mitigation credit. To meet the remaining stream mitigation credit requirements in Maryland, 1,207 functional feet of stream mitigation credits will be purchased from a mitigation bank, resulting in a total of 7,511 functional feet of proposed stream mitigation credit for Phase 1 South in Maryland. The Cabin Branch mitigation site (RFP-2) consists of restoring a primary and several

secondary stream channels within an abandoned golf course. Several man-made ponds will be filled and converted to palustrine forested wetlands and the restored channels will be reconnected to the floodplain. The proposed wetland creation and enhancement activities will provide 4.61 acres of mitigation credits for improvements to nutrient removal, sediment/toxicant retention, groundwater discharge/recharge, floodflow alteration, wildlife habitat and several other functions and values. The proposed stream restoration activities will result in 5,583 functional feet of mitigation credits. The second nontidal wetlands and waterways compensatory mitigation site, the unnamed Tributary to Great Seneca Creek stream restoration project (CA-5), will restore two mainstem reaches and two tributaries located within the Quince Orchard Valley Neighborhood Park. The proposed stream restoration will provide 721 functional feet of mitigation credits. The goal of the project is to achieve long-term stability by increasing floodplain connection, providing a stable channel design, increasing bank stability, stabilizing groundwater seep and tributary head cut channels, and minimizing the impact to adjected trees and other natural resources, along with several other objectives. In addition, the design of the project will focus on improving habitat for fish, aquatic insects, and other wildlife, as well as providing overall functional uplift. Additional details on proposed construction activities at both nontidal wetlands and waterways compensatory mitigation sites will be available during later design phases. The remaining mitigation requirements, totaling 1,207 functional feet of stream mitigation credits, will be provided by purchasing credits from the Even Flow Mitigation Bank that will have an initial credit release in the summer of 2022.

The PA will also impact park and recreational facilities. The impacts to publicly owned parks would be partial property acquisitions along adjacent interstates for roadway widening, stormwater management, augmentation of culverts, construction of retaining walls, grading, construction or reconstruction of noise barriers, and landscaping. Mitigation for impacts to publicly owned park properties includes replacement land, as well as park specific improvements such as ecological restoration, invasive species removal, landscaping, restoring outfalls and streams, and funding of park related buildings and amenities. A detailed list of park mitigation is included in Appendix G of the FEIS.

2.7 Plan Showing Proposed Activities

Construction Design Plans are not publicly available at this time. However, wetland and waterway impact plates for Phase 1 South are included in the JPA, which depict the locations of existing and proposed structures at impact locations. A list of new and extended culverts and bridges by station is included as **Appendix C**. The location of proposed and existing structures, as well as potentially affected surface water bodies, including wetlands is depicted on the Potential Discharge Location Map for the Phase 1 LOD (**Appendix D1**). **Appendix D2** includes the locations of off-site compensatory stormwater quality treatment sites and nontidal wetlands and waterways compensatory mitigation, including any potential discharges. **Appendix D3** includes the locations of proposed park mitigation sites, including any potential discharges. Specific details regarding the current design (e.g., SWM, culverts) are subject to change as project designs are refined over the course of the design process, but any mitigation required will be provided by final design. More detailed site-specific information for off-site compensatory stormwater quality treatment can be found in the *Compensatory SWM Plan* included as Appendix D of the FEIS (FHWA and SHA 2022). Site-specific information about the nontidal wetlands and waterways compensatory

mitigation can be found in the *Final Compensatory Wetlands and Waterways Mitigation Plan* included as Appendix O of the FEIS.

2.8 Location and Nature of Potential Discharge and Receiving Waters

2.8.1 Direct and Indirect Impacts from Potential Discharge

Direct impacts to wetlands and waterways associated with construction of Phase 1 South include fill from roadway and interchange construction, drainage improvements, augmented culverts, bridges and retaining and noisewalls, and temporary construction-related activities. A summary of all permanent and temporary impacts to wetlands and waterways associated with the Phase 1 South LOD and off-site compensatory stormwater quality treatment and nontidal wetlands and waterways compensatory mitigation areas can be found in the revised JPA, submitted on May 3, 2022 [U.S. Army Corps of Engineers Application Number NAB-2018-02152 (MDOT SHA/I-495 I-270 Managed Lane Study) and Maryland Department of the Environment, Nontidal Wetlands and Waterways Tracking Numbers 20-NT-0114 / 202060649 / AI 168251]. Note that impacts to wetlands and waterways could increase during final design due to unforeseen circumstances; however, the Developer will also be incentivized to reduce impacts to wetlands and waterways, and some of the impacts reported below may be reduced or converted to temporary impacts during later phases of design if feasible. Wetland and waterway impact plates for Phase 1 South are also included in the JPA. All Phase 1 South impacts requiring mitigation are in the Middle Potomac-Catoctin Federal HUC-8 watershed (02070008).

The construction of Phase 1 South will affect surface waters, surface water quality, aquatic biota, and watershed characteristics due to direct and indirect impacts to intermittent and perennial stream channels and increases in impervious surface in their watersheds. In addition, there is the potential for decreased aquatic organism passage from the extension of culverts. These impacts for Phase 1 South are summarized below.

Impacts to surface water quality during construction will include filling of wetlands and waterways and vegetated buffer removal. Other potential impacts to surface water quality related to roadway projects are accidental spills and sediment releases, which can cause direct mortality to aquatic life or impact biota through the potential to contaminate waterways in the vicinity of the project area. Impacts associated with the use of the road after construction are mainly based on the potential for contamination of surface waters by runoff (e.g., petroleum products, heavy metals, nutrients, organic pollutants, road salts) and an increase in stormwater volume and thermal impacts from new impervious roadway surfaces.

Most of these potential contaminants are related to gasoline additives and regular or seasonal highway maintenance. Other sources of metals include mobilization by excavation, vehicle wear, combustion of petroleum products, historical fuel additives, and catalytic-converter emissions. Generally, heavy metals from highways found in streams are not at concentrations high enough to cause acute toxicity (CWP, 2003). However, during seasonal roadway deicing, MDOT SHA most commonly uses rock salt (sodium chloride), a salt brine, and magnesium chloride, which can cause acute and chronic toxicity in fish, macroinvertebrates, and plants. Heavy, repeated use of road salt can also permanently damage landscape

soils and their ability to sustain plant growth (MDOT SHA 2020). Slight increases in salinity in waterways can negatively affect species richness of aquatic organisms, inhibiting their development and altering their community structure (Stranko et al. 2013). Long-term effects of salt runoff include accumulation in groundwater, increasing salinity of drinking water in reservoirs, as well as year-round release of salt into waterways (Kelly et al. 2019). However, the level of toxicity is dependent on the amount that is applied and the dilution of the receiving waters.

Tree removal during the construction process can reduce the amount of shade provided to a stream and thereby raise the water temperature of that stream. In addition to tree removal, stormwater discharges also have the potential to increase surface water temperatures in nearby waterways. The effect of the temperature change depends on stream size, existing temperature regime, the volume and temperature of stream baseflow, and the degree of shading. Increased stream temperature can negatively affect the health of aquatic organisms by decreasing the amount of available dissolved oxygen and ultimately causing developmental and reproduction issues (Zeiger and Hubbard 2015).

A summary of new impervious surfaces for Phase 1 South is included in **Table 5**. Additional impervious surface includes all new impervious surfaces outside of the existing roadway footprint.

Table 5. Additional Impervious Surfaces by Watershed

MDNR 12-Digit Watershed Name	MDNR 12-Digit Watershed	USGS 12-digit HUC Name	USGS 12-digit HUC Number	AC	SF
Potomac River/Rock Run	021402020845	Nichols Run-Potomac River	020700081003	15.0	654,707
Cabin John Creek	021402070841	Cabin John Creek	020700081003	77.0	3,355,862
Rock Creek	021402060836	Lower Rock Creek	020700100102	0.8	32,670
Muddy Branch	021402020848	Muddy Branch	020700081001	7.2	313,196
Watts Branch	021402020846	Watts Branch	020700081002	3.2	137,214

As discussed in Sections 2.9 and 2.11 below, MDOT SHA has taken measures to avoid, minimize, and mitigate discharges that may affect surface water quality. Water quality effects will be largely minimized through the use of MDE-approved Erosion and Sediment (E&S) Controls, SWM Best Management Practices (BMPs), and Environmental Site Design (ESD)[1].

2.8.2 The Characteristics of the Potential Discharge

Details regarding the characteristics of stormwater discharge from the project (e.g., flow rate, chemical constituents, frequency, duration, temperature) will not be available until the project design progresses. Duration and flow will depend on the type of facility treating the discharge. Potential chemical constituents are discussed in **Section 2.8.1** above, but could include petroleum products, heavy metals, nutrients, organic pollutants, and road salts. As discussed in **Section 2.9**, proposed SWM facilities addressing water quality treat small storm events, generally between one-to-two-inch events, while much

[1] *ESD are environmental site design practices which are "Chapter 5" practices from the MDE 2009 SWM manual. They are mostly micro scale practices with small drainage area limits such as bio-swales and microbioretention. BMP is a broader category and can be a variety of practices, but can refer to larger facilities with a bigger drainage area and footprint.*

of the flow from larger storm events would bypass the facilities. However, even in larger events, facilities are designed to capture the first flush of runoff, where the highest pollutant concentrations are expected. Specific treatment and sizing of each facility would be determined during later phases of the design process; however, when the treatment facilities are designed, they will be designed to the latest MDE SWM criteria, and in many cases will provide more improved treatment than is currently provided in the corridor. Stormwater discharges resulting from the project have the potential to increase surface water temperatures in nearby waterways. However, some SWM practices being utilized, such as underground vaults can reduce the extent of temperature changes in waterways by storing and cooling runoff away from the sun's rays and then slowly releasing cooled flows to receiving waters, thereby reducing the thermal energy of runoff from impervious surfaces (Herb et al. 2009).

2.8.3 The Locations of Potential Discharge Points

As required, MDOT SHA identified the locations of any potential discharge points associated with Phase 1 South. These include discharges associated with the project LOD, as well as off-site compensatory stormwater quality treatment and nontidal wetlands and waterways compensatory mitigation. Points of Investigation (POIs) were identified at locations where concentrated runoff from the project site leaves the MDOT SHA ROW or LOD. Lines of Investigation (LOIs) were identified at locations where runoff leaves the MDOT SHA ROW or LOD in the form of sheet flow. It was assumed that these POI and LOIs represent potential discharge points for the Phase 1 South LOD. All proposed on-site SWM drains into these POIs/LOIs. A total of 167 POIs/LOIs/discharge locations were identified for the project LOD and 55 discharge locations were identified for 70 total off-site compensatory stormwater quality treatment and nontidal wetlands and waterways compensatory mitigation areas. Potential discharges for off-site compensatory stormwater quality treatment and nontidal wetlands and waterways compensatory mitigation sites were identified at the downstream-most point of each off-site area. POI/LOI/discharge locations and drainage areas are depicted on the Potential Discharge Location map included in **Appendix D1** for the Phase 1 South LOD, **Appendix D2** for off-site compensatory stormwater quality treatment and nontidal wetlands and waterways compensatory mitigation areas, and **Appendix D3** for the park mitigation sites. The tables presented in **Appendix E** lists the identified POI/LOI/discharge points, the type and number of proposed BMPs draining to the discharge points, a description of the discharge location, and the name and 12-digit hydrologic unit code (HUC-12) of the receiving waterbody. A map depicting the locations at which the potential discharge from the Phase 1 South LOD, off-site SWM/ compensatory mitigation, and park mitigation enters navigable waters is included as **Appendix F1, Appendix F2**, and **Appendix F3**, respectively. These appendices also include the coordinates in degrees, minutes, and seconds of the potential discharge points into navigable waters. Navigable waters were identified using the National Waterway Network database in MD iMap.

2.8.4 Aquatic Life Use Data for Receiving Waters

Existing data on aquatic biota for the receiving waters within the Phase 1 South corridor were gathered from Montgomery County Department of Environmental Protection (MCDEP), Maryland Biological Stream Survey (MBSS), and MDOT SHA, all of which conduct periodic monitoring of stream habitat, benthic macroinvertebrates, and/or fish within the vicinity of the project area. Existing data were also compiled

from the National Water Quality Monitoring Council (NWQMC) database which houses water quality data collected by various agencies and groups, including MDE and the Chesapeake Bay Program. **Appendix G** includes a summary of water quality, aquatic habitat, benthic macroinvertebrate, and fish data available for waterways downstream of each POI/potential discharge point. Sampling locations in relation to potential discharges are depicted in **Appendix D1, Appendix D2, and Appendix D3**. Data were gathered from 2007 - 2021. Sites with multiple years of data are reported as ranges.

2.8.5 Antidegradation Alternatives Analysis for Tier II waters.

The potential discharge resulting from the project will enter several receiving waters, as depicted in **Appendix D1, Appendix D2, and Appendix D3**. None of these receiving waters are classified as Tier II waters, thus the antidegradation alternatives analysis for Tier II waters is not applicable.

2.8.6 Existing and Designated Uses Potentially Affected by Proposed Activities

Table 6 includes the use class designations for all waterways potentially affected by the Phase 1 South activities (including off-site compensatory stormwater quality treatment, nontidal wetlands and waterways compensatory mitigation, and park mitigation). A list of designated uses by watershed is included in **Tables 1-4**. Designated uses within Phase 1 South LOD include Use I and Use I-P. Designated uses for the off-site compensatory stormwater quality treatment and nontidal wetlands and waterways mitigation sites include Use I, Use I-P, Use III, Use III-P, and Use IV.

The Potomac River is classified as Use I-P and is protected for Water Contact Recreation, Protection of Aquatic Life, and Public Water Supply due to its role as the primary source of drinking water for the District of Columbia, and many of the surrounding communities. The Washington Aqueduct, which is operated by the USACE, withdrawals and treats approximately 150 million gallons of water per day on average from the Potomac River to provide drinking water to the District of Columbia, as well as Fairfax and Arlington Counties, Virginia. The Aqueduct's primary water intake is located above Great Falls, several miles upstream of the Preferred Alternative's crossing of the Potomac River on the American Legion Bridge. However, the Aqueduct system also has an intake at the dam at Little Falls, approximately 3 miles downstream of the PA (**Appendix F1, F2, and F3**) which is used intermittently for drinking water supplies according to the National Pollution Discharge Elimination System (NPDES) permit for the Aqueduct (NPDES Permit No. DC0000019).

Table 6. Summary of Designated Uses Associated with Phase 1 South, Off-site Compensatory Stormwater Quality Treatment and Nontidal Wetlands and Waterways Mitigation, and Park Mitigation

Use Class	Location	Description
I	Phase 1 South LOD /Off-site compensatory stormwater quality treatment	Water Contact Recreation and Protection of Nontidal Warmwater Aquatic Life
I-P	Phase 1 South LOD	Water Contact Recreation, Protection of Nontidal Warmwater Aquatic Life, and Public Water Supply

Use Class	Location	Description
	/Off-site compensatory stormwater quality treatment and Nontidal wetlands and waterways compensatory mitigation/Park Mitigation	
III	Off-site compensatory stormwater quality treatment	Nontidal Coldwater
III-P	Off-site compensatory stormwater quality treatment	Nontidal Coldwater and Public Water Supply
IV	Off-site compensatory stormwater quality treatment	Recreational Trout Waters

Source: COMAR Section 26.08.02.02

Note that under COMAR Section 26.08.02.02, specific designated uses apply to each use class category. For Use III, III-P, and IV waters, specific designated uses include all those afforded to Use I waters, in addition to those specific to the use class category (e.g., growth and propagation of trout for Use III waters). Use I-P and III-P waters are also designated for use as public water supply.

2.9 Treating, Controlling, Managing, and Monitoring Discharge

Direct and indirect impacts to surface waters as a result of the Phase 1 South portion of the MLS would result in loss of habitat, removal of vegetated buffers, and increased imperviousness, as well as the potential for increased sediment/erosion, pollutants, temperature, salinity, water quantity, and fish blockages from augmented culverts. MDOT SHA has taken measures to treat, control, and manage potential discharge associated with the project; monitor SWM facilities through triennial inspections; monitor nontidal wetlands and waterways compensatory mitigation sites; and to protect designated uses, as described below.

Discharge During Construction

All wetlands, wetland buffers, waterways, vegetation, and FEMA 100-year floodplains were avoided and minimized to the maximum extent practicable during the planning stage of design. In addition, further avoidance and minimization efforts will be employed to the maximum extent practicable during the design/build (D/B) process. The Developer will be incentivized to reduce wetland, stream, and other potential environmental impacts below a defined maximum baseline. Further details will be provided once the Developer has been selected. Unavoidable impacts to surface waters, wetlands, and forest will be fully mitigated to offset direct impacts to aquatic biota, habitat, and water quality. Details on avoidance, minimization, and mitigation are described in **Section 2.11** below.

To protect aquatic species, all in-stream work will comply with the stream closure period for the designated use class of the stream, including activities for culvert extension. Any potential waiver requests would require agency approval(s). In-stream work is prohibited in Use I and I-P streams from March 1 through June 15; in Use III and III-P streams from October 1 through April 30; and in Use IV streams from March 1 through May 31.

Discharges of sediment during construction will be avoided or minimized using MDE's *2011 Standards and Specifications for Soil and Erosion Control* (MDE 2011), which were developed to protect water quality during construction. MDOT SHA will use the standard inspection and monitoring procedures outlined in in their MDOT SHA's Quality Assurance Program for SWM and E&S inspection, including weekly and post-storm event monitoring and reporting. These procedures will ensure that all construction activities comply with the stormwater and sediment control laws of Maryland. In addition, more detailed compliance requirements are being negotiated with the Developer and may be adopted. MDOT SHA will also provide qualified Independent Environmental Monitors (IEM) who will assess compliance with all environmental permits and permit conditions, authorizations, and environmental regulations for Phase 1 South. The IEM's role will include:

- Reviewing design and construction activities for compliance with all conditions of MDE, U.S. Army Corps of Engineers (USACE), and other Governmental entity permits, as well as other applicable authorizations and environmental regulations;
- Reporting findings directly and concurrently to MDE's Nontidal Wetland Division, USACE and other resource-specific Stakeholders, notifying Stakeholders and MDOT immediately of any reported or observed violations or non-compliance issues within the terms or conditions of MDE and other permits, the Water Quality Certification, or approved Plans and specifications;
- Independently documenting impacts to regulated resources by developing and maintaining a detailed tracking list of impacted resources; and
- Assisting with the identification of ongoing opportunities for further avoidance and minimization of impacts to regulated environmental resources and protection of water quality.
- Review of water quality monitoring data.

Discharge After Construction

Long-term impacts to water quality and quantity after construction will be mitigated using MDE compliant SWM. The Developer will be incentivized to provide as much on-site SWM as possible. A detailed hydrologic and hydraulic (H&H) study will be prepared during final design to refine the existing storm discharge and floodplain impacts.

All construction occurring within the FEMA designated floodplains will comply with FEMA-approved local floodplain construction requirements. These requirements consider structural evaluations, fill levels, and grading elevations. All hydraulic structures will be designed to accommodate flood volumes without causing substantial impact. Culverts and bridges will be designed to limit the increase of the regulatory flood elevation to protect structures from flooding risks, and standard hydraulic design techniques for all waterway openings would be utilized where feasible to maintain current flow regimes, limit upstream flooding, and preserve existing downstream flow rates. At this stage of the design, new, replacement and augmented culverts are anticipated at multiple locations. For new culverts, 100-year high water elevation is required to be contained within either right-of-way or permanent easement. For existing, replacement, augmented, or extended culverts, the 100-year storm headwater elevation for the proposed conditions

will be at or below the existing 100-year headwater elevation or contained within the final ROW. In all cases, the 100-year storm will not overtop the roadway. Culvert improvements and new culvert design would ensure that flood risk to adjacent properties is not increased. Location hydraulic studies for floodplain encroachment areas will also be completed at later stages of design to ensure compliance with requirements set forth in 23 CFR § 650.111.

To avoid impacts to aquatic life passage, bridges and depressed culverts will be used wherever possible to maintain natural stream substrate if new or replaced culverts are necessary. However, opportunities for using depressed culverts may be limited because most existing culverts would be extended or augmented rather than replaced. Channel morphology will be evaluated, and culvert extensions will be designed to maintain aquatic life passage by avoiding downstream scour and channel degradation. Current designs include proposed augmentations involving new pipes installed adjacent to existing culverts to provide additional area to accommodate flow volumes and thus reduce the potential for increases in upstream water surface elevations. MDOT SHA is committed to maintaining existing adequate passage zones for or improving aquatic life passage in the primary culverts that are being replaced or extended and will continue to coordinate with MDNR and USFWS regarding aquatic life passage as the design progresses.

The Stormwater Management Act of 2007 requires MDOT SHA to establish a comprehensive process for SWM approval and implementing ESD to the maximum extent practicable for Phase I South. Both quantity and quality facilities were considered and will continue to be considered through the design process. All facilities will be designed in accordance with the requirements of the MDE *Maryland Stormwater Design Manual* (2000) using standard H&H models including TR-55 and TR-20 and MDE approved methodology. Quantity facilities, which are described in Chapter 3 of the MDE *Maryland Stormwater Design Manual* (2000), can be any facility that provides quantity management, including retention, detention, and extended detention facilities. ESD facilities can be any practice listed in Chapter 5 of the manual, including submerged gravel wetlands, micro-bioretention, etc., which provide Environmental Site Design Runoff Volume (ESDv), a combination of water quality and small storm quantity management. To avoid and minimize impacts to water quality and quantity associated with the proposed development, MDOT SHA evaluated SWM requirements for ESDv, Impervious Area Requiring Treatment (IART), Water Quality Volume (WQv), Channel Protection Volume (CPv), Recharge Volume (Rev) and Overbank Protection Volume (Qp). Coordination with Montgomery County to confirm and/or solicit downstream flooding concerns has been initiated and will need to be completed during the design process after the NEPA process has been concluded; however, Montgomery County requires a Qp of 10-year management and an Extreme Flood Volume (Qf) of 100-year management at outfalls with documented downstream flooding concerns.

To determine the SWM requirements for Phase 1 South, MDOT SHA evaluated the study corridor using POIs, where concentrated runoff from the project site leaves the MDOT SHA ROW or LOD. LOIs were also identified at locations where runoff leaves MDOT SHA ROW or LOD in the form of sheet flow. A total of 167 POIs/LOIs have been currently identified for the project LOD, as depicted in **Appendix D1**. Water Quality Summary Sheets summarizing current POI data, water quality required, and water quality provided for each POI are included as **Appendix H**. **Table 7** below summarizes the IART, provided Impervious Area Treated (IAT), and off-site requirements for each POI section of the Phase 1 South LOD.

Based on this analysis, the estimated IART is 210 acres and the IAT is 208 acres, resulting in a deficit of about 2 acres. Treatment requirements that cannot be met on-site will be off set with approved off-site treatment in the same watershed. Numerous off-site treatment options have been identified in the affected watersheds and are discussed in greater detail below. All determinations of minimum SWM criteria for this project are preliminary. The final determination of the required ESDv, WQv, CPv, Rev, Q10 and Q100 management volumes and discharge rates for each POI and the project will be made at the detailed design stage as part of the erosion and sediment control and stormwater management plan review and approval process.

ESD requirements are being met to the maximum extent practicable (MEP). To address these on-site SWM requirements, ESD facilities including bio-swales, grass swales, submerged gravel wetlands and micro-bioretentions were proposed to the MEP. At locations where ESD was not practical, Chapter 3[2] SWM facilities have been proposed to meet the remaining WQv, including CPv, and quantity requirements. ESD facilities typically address the one-year storm events, while much of the flow volume from larger storm events would bypass these facilities. **Table 8** summarizes the total provided ESDv and REv for each SWM type for each POI section of the LOD. The locations of these SWM features within the project area are depicted in **Appendix D2**. According to the MDOT SHA Sediment and Stormwater Guidelines, in Montgomery County, Qp is required for the 10-year and 100-year storms if there are downstream flooding problems. The management of the 10-year storm and CPv for this project must be provided at each POI/LOI, according to PRD. The concept SWM design met these water quantity requirements at the majority, but not all, of the POI/LOIs evaluated. At the detailed design stage, a variance explaining the circumstances that did not allow SWM requirements to be met will be requested for each POI that does not meet water quantity requirements. A waiver will be provided to explain when there are situations within POI/LOIs that make the SWM requirements moot. Stormwater quantity management waivers and variances are evaluated on a case-by-case basis. Hydrologic and hydraulic modeling and an assessment of the benefits of each on-site BMP proposed on the impacts at the POI will be required. See **Appendix I** for a summary of all POI/LOI and whether each meets the water quantity requirements or if a waiver/variance was requested. During final design, both Chapter 5 and Chapter 3 SWM facilities will be designed in accordance with current MDE SWM regulations.

At the current phase of design, MDOT SHA has identified numerous potential off-site stormwater quality treatment locations to offset any unmet on-site water quality treatment requirements. While not required as part of the quantity waiver or variance request, it should be noted that the watershed where SWM quantity waiver/variance requests are anticipated have proposed off-site SWM that could provide water quality benefits to the same watersheds. Of the 14 POI/LOIs that do not meet the quantity requirement, five POI/LOIs have at least two potential off-site stormwater quality treatment sites, upstream and/or downstream, on the same stream reach. All other POI/LOIs that do not meet the quantity requirement have at least 10 potential off-site stormwater quality treatment sites in the same stream network. In addition, four POIs that do not meet the quantity requirement drain directly to the Potomac River. A total of 36 off-site stormwater quality treatment sites could contribute quality treatment to the Potomac River watershed upstream of the POI discharge locations and 31 off-site stormwater quality treatment sites

[2] *Chapter 3 is referring to the section of the MDE Maryland Stormwater Design Manual (2000).*

contribute quality treatment to the Potomac River downstream of the POI discharge locations. Although not all the downstream off-site mitigation sites are within the watersheds that contain the Phase 1 South corridor, they do contribute to the Potomac River water quality. Final off-site stormwater quality treatment locations will be determined based on final design calculations of treatment required and the suitability of sites based on their location, overall feasibility, and ability to best meet water quality requirements.

More detailed site-specific information for off-site compensatory stormwater quality treatment areas can also be found in the *Compensatory SWM Plan* included as Appendix D of the FEIS (FHWA and SHA 2022). Note that final design and construction of Phase 1 is expected to be performed by the Developer through D/B teams that are currently under procurement. Separate SWM reports will be provided by each of the D/B teams during final design. The D/B teams will be responsible for obtaining concept, site development and final approvals through PRD and will be responsible for obtaining all necessary SWM permits through MDE.

The use of the proposed SWM techniques will reduce or make impacts to receiving waters negligible, through reduction of storm volume, pollutant loads, erosion and sedimentation, and temperature. Published pollutant removal rates for total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) have been predicted using the pollutant removal adjustor curves developed by the Chesapeake Bay Program (CBP) publication *Recommendations of the Expert Panel to Define Removal Rates for New State Stormwater Performance Standards* (Schueler and Lane, 2012 and 2015). The curves calculate expected pollutant removal based on the runoff depth (measured in inches) captured per impervious acre draining to the respective BMP. These curves can be found in Appendix A of the *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated: Guidance for National Pollutant Discharge Elimination System Stormwater Permits* (MDE 2020).

The International Stormwater BMP Database 2020 Summary Statistics presents statistics on actual BMP performance including removal of TN, TP, TSS, total dissolves solids (TDS), and various heavy metals for a selection of commonly used BMPs (The Water Research Foundation, 2020). Data is not available for all BMP types; however, for TN, TP, TSS, and TDS there is data available for retention ponds and grass swales. In general, retention ponds show significant statistical reduction in concentrations of TN, TP, and TSS, but show an increase in TDS. Grass swales also show a significant reduction of TSS and slight reduction of TN but show no significant difference in concentration of TDS and an increase in concentration of TP, which may be related to phosphorus rich soils and planting media used in these BMPs. TDS removal is challenging in BMPs, and no BMPs included in the study showed significant removal of TDS. A summary of percent reduction of pollutant concentration for TN, TP, TSS, and TDS by the proposed SWM BMPs is presented in **Table 9**.

Table 7. Preliminary SWM Water Quality Summary

POI	Existing Impervious within LOD (acres)	Proposed Impervious within LOD (acres)	Maintenance Area within LOD (acres)	Loss of Water Quality (acres)	Impervious area Already Treated (acres)	Net Change in Impervious (acres)	Impervious Area Requiring Treatment from Redevelopment (acres)	IART from New Development (acres)	Total IART (acres)	MDOT SHA Impervious Area Treated (acres)	Non MDOT SHA Impervious Area Treated	Effective Impervious Area Treated (acres)	Water Quality Summary excess/deficit (acres)
	A_{Ei}	A_{Pi}	A_{Mi}	A_{Li}	A_{RECi}	$\Delta Ai = A_{Pi} - A_{Ei}$	$IART_{RE\text{-}DEV'L} = 0.5(A_{Ei} - A_{Mi} - A_{RECi})$ or 0	$IART_{NEW} = \Delta Ai$ or $A_{Pi} - A_{Mi} - A_{RECi}$	$IART = IART_{RE\text{-}DEV'L} + IART_{NEW} + A_{Li}$			IAT	ΣWQ Summary=ΣIAT-ΣIART
POI SA110500 to POI SA118081	14.87	29.90	0.00	4.48	0.00	15.03	6.70	16.53	27.71	23.72	0.01	23.53	-4.18
LOI SA118255 to LOI SA121776	12.75	21.97	0.00	1.10	0.00	9.22	6.11	9.78	16.99	11.59	0.00	8.35	-8.64
POI SA121792 to POI SA122984	27.61	69.05	0.00	0.96	0.96	41.44	13.33	41.45	55.74	50.78	0.00	49.92	-5.82
POI SB205850 to LOI SA202400E	14.02	23.67	0.00	0.84	0.00	9.65	5.47	12.74	19.05	14.03	0.00	13.28	-5.77
POI SB500287 to LOI-SB205654W	21.07	28.21	0.00	3.41	0.00	7.14	10.55	7.14	21.10	17.72	0.00	17.72	-3.38
POI SB202469W to POI SB199564W	0.62	1.37	0.00	3.56	0.00	0.75	0.32	0.76	4.64	6.12	0.00	5.69	1.05
POI SB500287 to POI 511923	22.74	33.17	0.00	5.26	0.00	10.97	10.74	12.33	28.33	29.92	0.00	28.45	0.12
POI SB607510 to POI SB062100	52.96	52.29	29.84	0.42	7.62	-0.67	7.48	-0.12	7.78	26.32	0.00	22.56	14.78
POI SB701573 to POI SB707519	9.39	13.21	0.00	0.00	0.00	3.82	4.50	4.29	8.79	15.55	1.22	13.96	5.17
POI SB804740 to POI SB801364	53.25	60.44	35.50	1.72	0.00	7.19	6.83	11.30	19.85	24.13	0.00	24.13	4.28
TOTAL	**229.28**	**333.28**	**65.34**	**21.75**	**8.58**	**104.54**	**72.03**	**116.20**	**209.98**	**219.88**	**1.23**	**207.59**	**-2.39**

Table 8. Preliminary Provided On-site SWM

POI Range	Total ESDv Required	Total REv Required	Total ESDv Provided	Total REv Provided	Micro Practices (Chapter 5)			Filtering Systems (Chapter 3)			Ponds (Chapter 3)			Other		
					Number of Facilities	ESDv Provided	REv Provided	Number of Facilities	ESDv Provided	REv Provided	Number of Facilities	ESDv Provided	REv Provided	Number of Facilities	ESDv Provided	REv Provided
POI SA110500 to POI SA118081	150,945	13,415	100,951	12,478	23	70,365	10,638	5	30,586	4,253	N/A	N/A	N/A	N/A	N/A	N/A
LOI SA118255 to LOI SA121776	93,995	3,432	54,055	1,999	12	25,056	1,471	1	4,701	528	N/A	N/A	N/A	1	24,298	0
POI SA121792 to POI SA122984	384,319	26,221	320,565	21,194	13	35,922	4,863	2	10,711	398	3	270,895	15,185	3	3,037	0
POI SB205850 to LOI SA202400E	143,509	10,726	46,322	6,768	8	19,770	3,904	6	26,552	2,864	1	0	0	N/A	N/A	N/A
POI SB500287 to LOI SB206621W	146,867	10,382	308,703	16,846.00	42	141,722	16,846	N/A	N/A	N/A	N/A	N/A	N/A	6	121,544	0
POI SB202965W to POI SB199564W	19,307	5,527	24,345	3,564	2	21,207	3,564	1	3,138	0	N/A	N/A	N/A	3	51,650	0
POI SB500287 to POI SB511923	132,105	9,568	378,466	18,248	46	159,821	18,248	N/A	N/A	N/A	N/A	N/A	N/A	7	220,247	0
POI SB607375 to POI SB062100	50,500	1,631	58,999	13,533	30	58,999	13,533	1	0	0	1	0	0	N/A	N/A	N/A
POI SB701573 to POI 707519	51,625	3,163	81,699	6,126	9	48,689	2,451	3	13,770	1,904	N/A	N/A	N/A	N/A	N/A	N/A
POI SB804740 to POI SB801364	131,250	16,655	79,771	11,605	21	38,596	4,384	N/A	N/A	N/A	1	0	0	N/A	N/A	N/A
TOTAL	**1,291,581**	**112,830**	**1,188,801**	**110,067**	**184**	**518,372**	**68,536**	**27**	**144,803**	**18,741**	**6**	**270,895**	**15,185**	**13**	**200,529**	**0**

Table 9. Nutrient Removal Rates

BMP	95% Confidence Interval Pollutant Concentration Reduction			
	TN	TP	TSS	TDS
Retention Pond	26%	51%	66%	-46%
Grass Swale	11%	-40%	47%	-5%
Note: 1. Negative % indicates an increase in concentration after treatment. 2. Median value of 95% confidence interval used to calculate percent reduction.				

Generally, heavy metals from highways found in streams are not at concentrations high enough to cause acute toxicity (CWP, 2003). However, most of the BMPs studied, including retention ponds and grass swales, showed significant statistical reduction of copper, lead, and zinc concentrations (The Water Research Foundation, 2020). Detention ponds and grass swales also showed at least some reduction in concentration of arsenic, cadmium, chromium, iron, and nickel. A summary of percent reduction of pollutant concentration for copper, lead, and zinc by the proposed SWM BMPs is presented in **Table 10.**

Table 10. Heavy Metal Removal Rates

BMP	95% Confidence Interval Pollutant Concentration Reduction		
	Copper	Lead	Zinc
Retention Pond	49%	67%	58%
Grass Swale	43%	50%	43%
Note: 1. Median value of 95% confidence interval used to calculate percent reduction.			

Current research is limited on the effectiveness of traditional SWM practices in mitigating impacts from road salt applications; however, there is evidence that suggests current practices (e.g., stormwater ponds) do not protect receiving waters from road salt contamination (Snodgrass et al. 2017). As detailed in the *2020/2021 Maryland Statewide Salt Management Plan* (MDOT SHA 2020), MDOT SHA has established Best Practices for Salt Management in order to minimize road salt and brine use during winter operations**.** These best practices provide guidance for optimized use of road salt to lessen adverse impacts from its delivery, storage, and handling to its roadway application during winter storms and post-storm cleanup. Best Practices for Salt Management include optimizing mechanical removal operations and equipment; maintaining salt spreaders and spinners so that salt applications apply only the required amount of salt and minimize waste; utilizing other specialty equipment (e.g., snow blowers and front end loaders) for snow removal when appropriate; continuing to explore and research innovative equipment for mechanical removal of snow and ice; effectively tracking salt usage; and providing adequate training for hired contract equipment operators and frontline supervisors.

SWM practices such as wet ponds with bottom outlet structures and underground vaults can reduce the extent of temperature changes in waterways by attenuating runoff from heated impervious surfaces away from the sun's rays and then slowly releasing cooled flows back to receiving waters (Herb et al. 2009). Bioretention ponds are an effective BMP at reducing the temperature of stormwater runoff (Jones 2008). Other effective design methods at mitigating thermal impacts include using dry ponds to control runoff

quantity to avoid increased water temperature in standing pools, as well as using sand filters and biofiltration cells to cool water temperature through filtration (DEP 2010). Methods such as these will be considered as the project SWM design progresses.

The I-495 and I-270 corridors are in heavily urbanized areas with numerous resource and space constraints that limit the amount of SWM that can be provided practically on-site. As a result, the total estimated IAT that can be met on-site is 208 acres for Phase 1 South. Due to the large amount of IART and existing site constraints, water quality volume requirements could not be met for the project area (**Tables 7 and 8**). Consequently, an amount of off-site stormwater quality treatment is required to offset the water quality deficit. **Table 11** below summarizes the total IAT on-site and the resulting off-site compensatory stormwater quality treatment requirement that must be met.

Table 11. Off-site Requirements for Washington Metropolitan Watershed

6-Digit Name (Number)	8-digit Name (Number)	Phase 1 South SWM IART Requirement (AC)	Estimated On-Site Phase 1 South SWM IAT Provided (AC)	Target Compensatory Phase 1 South SWM IART Requirement (AC)
Potomac River – Washington Metropolitan (021402)	Potomac River — Montgomery County (02140202)	64.13	84.18	20.05
	Cabin John Creek (02140207)	141.21	117.72	-23.49
	Rock Creek (02140206)	4.64	5.69	1.05

Since all on-site options have been exhausted, off-site compensatory stormwater quality treatment will be achieved through the use of Chapter 3 and Chapter 5 SWM facilities. Chapter 5 practices will be used to the MEP before Chapter 3 practices are proposed, unless otherwise approved by MDE. Any off-site compensatory stormwater quality treatment sites being proposed in Use III, Use III-P, or Use IV-P watersheds will avoid or minimize impacts to trees to the MEP in order to reduce impacts to temperature. Potential impacts to temperature and additional avoidance and minimization will be evaluated as the design progresses. There are several POIs that qualify for waivers, and variances are being requested for other POIs. **Table 12** summarizes the IAT provided by each type of off-site SWM water quality measure, which includes a total of 27.39 acres of off-site IAT proposed to meet the IART requirement.

Table 12. Off-site Compensatory Stormwater Quality Treatment Measures for Washington Metropolitan Watershed

6-Digit Name (Number)	Type of Off-site SWM Water Quality Measure	IAT Provided (AC)
Potomac River – Washington Metropolitan (021402)	Chapter 5 SWM Facility (Micro-bioretention or Bio-swales)	26.57
	Chapter 3 SWM Facility	0.82

For a detailed discussion of off-site stormwater mitigation sites identified to meet the ESD requirements, see the *Compensatory SWM Plan* included as Appendix D in the FEIS (FHWA and SHA 2022).

To ensure that on-site and compensatory stormwater quality treatment sites continue to function as originally designed and permitted, MDOT SHA will locate, inspect, evaluate, and remediate SWM sites to sustain their functionality, improve water quality and stability, and protect sensitive water resources. This will be done for sites that fall under MDOT's Drainage and Stormwater Asset Management Program to comply with their National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit (MS4 permit No. 11-DP-3313 MD0068276). For these sites, MDOT SHA will perform routine maintenance annually, identify and perform required repair work, and reinspect on-site and compensatory stormwater quality treatment sites every 3 years. However, the developer is also pursuing purchasing credits from a private facility, which would not be part MDOT's Drainage and Stormwater Asset Management Program. All nontidal wetlands and waterways compensatory mitigation sites will be monitored in accordance with the Phase II Mitigation Plans in the *Final Compensatory Wetlands and Waterways Mitigation Plan* (CMP) included as Appendix O of the FEIS (FHWA and SHA 2022).

2.10 Project Schedule

The MLS Phase 1 South project does not currently have a construction schedule. However, it is anticipated that any project discharges will begin in summer 2023 and discharges during construction will last 3-4 years in duration.

2.11 Mitigation Plan

All wetlands, wetland buffers, waterways, forest, and FEMA 100-year floodplains were avoided and minimized to the maximum extent practicable during the planning stage of design. In addition, further avoidance and minimization efforts will be employed to the maximum extent practicable during the D/B process. The Developer will be incentivized to reduce wetland, stream, and other potential environmental impacts below a defined baseline, and to provide as much on-site SWM as possible. Further details will be provided once the Developer has been selected. A full description of avoidance and minimization measures can be found in the *Final Avoidance, Minimization and Impacts Report* included as Appendix N of the FEIS (FHWA and SHA 2022). Unavoidable impacts to surface waters and wetlands will be fully mitigated to offset direct impacts to aquatic biota, habitat, and water quality. The proposed permittee-responsible, off-site mitigation for Phase 1 South consists of two mitigation sites, including a total of 4.61 acres of potential wetland mitigation credits and 6,304 functional feet of potential stream mitigation credits in the Middle Potomac-Catoctin Federal HUC-8 Watershed. Sites include Seneca Creek Tributary (CA-5) and Cabin Branch (RFP-2). The remaining mitigation credits will be purchased through the Evenflow Mitigation Bank, with an initial credit release in the fall of 2022. Permittee-responsible mitigation sites are discussed in the CMP, included as Appendix O of the FEIS (FHWA and SHA 2022). These sites were chosen based on their potential for functional uplift, construction feasibility, proximity to the study area, mitigation credits, and replacement of lost functions and values resulting from roadway improvements.

All streams impacted from the project are classified as Use I or Use I-P, which includes Protection of Nontidal Warmwater Aquatic Life. Proposed stream mitigation sites were chosen based on their potential for ecological uplift, which will enhance the protection of aquatic life in the restored streams. The proposed off-site mitigation sites meet the MDE and USACE mitigation requirements for the PA in Maryland.

All nontidal wetlands and waterways compensatory mitigation sites will be subject to regular inspections to determine the progress and continued viability of the site. The post-monitoring period for each of the sites will be coordinated with the resource agencies and included in the Phase II Mitigation Plans. If remediation action is needed during or after the post-monitoring period, MDOT SHA will be responsible for preparing a remediation plan for the sites on public land and the RFP Contractor will be responsible for preparing a remediation plan for the site on private land that will be submitted for agency approval. The Cabin Branch mitigation site (RFP-2) is located on private land and will be completed by the RFP Contractor as a full delivery service. Each mitigation site has its own ecologically based performance standards that are tied to site-specific objectives and values that are included in the Phase II Mitigation Plans in the CMP, included as Appendix O of the FEIS (FHWA and SHA 2022). Performance standards for all the wetland mitigation sites are in accordance with the *Performance Standards and Monitoring Protocol for Permittee-responsible Nontidal Wetland Mitigation Sites in Maryland*, October 30, 2020. Mitigation sites will be monitored for up to ten years. If MDE and the USACE determines that the site is successful prior to year ten, monitoring may be abbreviated. If it is determined that the site is not meeting the performance standards during the monitoring period, an adaptive management plan will be developed, and remedial action will be implemented to ensure the success of the site.

As discussed in **Section 2.9** above, off-site stormwater quality treatment is required since water quality requirements could not be met within the project area. This off-site compensatory stormwater quality treatment will be achieved using Chapter 3 and Chapter 5 SWM facilities. For a detailed discussion of off-site stormwater mitigation sites identified to meet the ESD requirements, see the *Compensatory SWM Plan* included as Appendix D of the FEIS (FHWA and SHA 2022). To ensure that compensatory stormwater quality treatment sites continue to function as originally designed and permitted, MDOT SHA will locate, inspect, evaluate, and remediate compensatory stormwater quality treatment sites to sustain their functionality, improve water quality and stability, and protect sensitive water resources. MDOT SHA will perform routine maintenance annually, identify and perform required repair work, and reinspect on-site and compensatory stormwater quality treatment sites every 3 years.

Forest impacts in Maryland would total 461.85 acres within the Washington Metropolitan Watershed (MDE 6-Digit Watershed 021402). Unavoidable impacts to forest from the MLS that could indirectly affect water quality will be regulated by MDNR under the Maryland Reforestation Law. Forest impacts must be replaced on an acre-for-acre or one-to-one basis on public lands, within two years or three growing seasons of project completion (MDNR, 1997). The Maryland Reforestation Law hierarchy for mitigation options is on-site planting, then off-site planting on public lands within the same county and/or watershed. If planting is not feasible, there is the option to purchase credits from forest mitigation banks, or to pay into the state Reforestation Fund at a rate of 10 cents per square foot or $4,356 per acre. As such, MDOT SHA would first be required to find available public land to be reforested within the same county and/or watershed. If this is not possible, MDOT SHA could purchase credits in a forest mitigation

bank or pay into the MDNR Reforestation Fund. The MDNR Reforestation Fund is used by MDNR to plant replacement trees. A forest mitigation site search has been completed and the resulting report has been submitted to the MDNR Forest Service for review. Forest mitigation will be finalized during later phases of design.

2.12 Other Required Authorizations and Applicable Regulations/Policies

- Section 404 JPA – submitted on May 3, 2022, under review
- Section 10 Permit
- MDOT SHA Project Review Division
- MDE Dam Safety
- NPDES General NOI Permit
- NPDES MS4 Permit No. 11-DP-3313 MD0068276
- MD Reforestation Law
- Maryland Roadside Tree Permit
- Section 106
- Section 4F
- COMAR 26.08.02 (Water Quality)
- COMAR 26.17.04 (Construction on Nontidal Waters and Floodplains)
- COMAR 26.17.01 (Erosion and Sediment Control)
- COMAR 26.17.02 (Stormwater Management)

2.13 Required Statements

The project proponent hereby certifies that all information contained herein is true, accurate, and complete to the best of my knowledge and belief. In addition, the project proponent hereby requests that the certifying authority review and take action on this CWA 401 Certification Request within the applicable reasonable period of time.

2.14 Discharges to Outstanding National Resource Waters

The potential discharge resulting from the project will enter several receiving waters, as depicted in **Appendix D1, D2, and D3**. None of these receiving waters are classified as Tier 3 Outstanding National Resource Waters (ONRWs), thus this section is not applicable. ONRWs are high quality waters that constitute an outstanding national resource, such as waters of national and State parks and wildlife refuges, and waters of exceptional recreational or ecological significance.

3 CONCLUSION

Construction of the MLS Phase 1 South project will result in direct and indirect impacts to surface waters from the loss of habitat, removal of vegetated buffers, and increased imperviousness, as well as the potential for increased sediment/erosion, pollutants, water quantity, and decreased fish passage. Section 401 of the CWA requires that any applicant for a Federal permit or license to conduct an activity, including,

but not limited to, the construction or operation of facilities, which may result in a discharge to a navigable water shall provide certification from the State that the proposed discharge complies with the State's water quality standards and requirements. MDOT SHA has taken the following measures to ensure that any potential discharges associated with the project comply with Maryland water quality standards:

- All wetlands, wetland buffers, waterways, vegetation, and FEMA 100-year floodplains were avoided and minimized to the greatest extent practicable, resulting in a significant reduction of impacts.
- To protect aquatic species, all in-stream work will comply with the stream closure period for the Use I, I-P, III, III-P, and IV streams.
- Discharges of sediment during construction will be avoided or minimized using MDE's *2011 Standards and Specifications for Soil and Erosion Control* (MDE 2011), which were developed to protect water quality during construction.
- MDOT SHA will use their standard inspection and monitoring procedures under their Quality Assurance Program for SWM and E&S inspection, which will ensure that all construction activities comply with the stormwater and sediment control laws of Maryland. In addition, more detailed compliance requirements are being negotiated with the Developer and may be adopted.
- MDOT SHA will provide qualified IEM who will report to MDE and who will assess compliance with all environmental permits and permit conditions, authorizations, and environmental regulations for Phase 1 South.
- Long-term impacts to water quality and quantity after construction will be mitigated using MDE compliant SWM, which has been documented to reduce stormwater volume and remove sediment, nutrients, and metals. ESD will be used to the maximum extent practicable. When treatment facilities are designed, they will be designed to the latest MDE SWM criteria, and in many cases will provide more improved treatment than is currently provided in the corridor.
- Due to the large amount of IART for each alternative and existing site constraints, water quality requirements could not be met within the project area (while still meeting CP_v requirements), and an amount of off- site mitigation is required to offset the water quality deficit. Off-site mitigation sites have been identified and included in the *Compensatory SWM Plan* to meet the water quality deficit.
- While not required as part of the waiver request, it should be noted that many of the streams where quantity waiver requests are anticipated have proposed off-site stormwater quality treatment that would provide water quality treatment to the same stream network or receiving waters, therefore further minimizing potential impacts off-site.
- To ensure that on-site and compensatory stormwater quality treatment sites continue to function as originally designed and permitted, MDOT SHA will locate, inspect, evaluate, and remediate SWM sites to sustain their functionality, improve water quality and stability, and protect sensitive

water resources. This will be done for sites that fall under MDOT's Drainage and Stormwater Asset Management Program to comply with their National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit (MS4 Permit No. 11-DP-3313 MD0068276). However, the Developer is also pursuing purchasing credits from a private facility, which would not be part MDOT's Drainage and Stormwater Asset Management Program.

- As detailed in the *2020/2021 Maryland Statewide Salt Management Plan* (MDOT SHA 2020), MDOT SHA has established Best Practices for Salt Management in order to minimize road salt and brine use during winter operations. These practices will be followed for the MLS Phase 1 South project.

- If new or replacement culverts are required, bridges and depressed culverts will be used to the extent practicable to maintain natural stream substrate that avoids or minimizes impacts to fish passage. However, opportunities for using depressed culverts may be limited because most existing culverts would be extended or augmented rather than replaced. Channel morphology will be evaluated, and culvert extensions/augmentation will be designed to maintain aquatic life passage where feasible by avoiding downstream scour and channel degradation.

- Unavoidable impacts to surface waters, wetlands, and forest will be fully mitigated to offset direct impacts to aquatic biota, habitat, and water quality. The proposed permittee-responsible, off-site mitigation for Phase 1 South consists of two mitigation sites, including a total of 4.61 acres of potential wetland mitigation credits and 6,304 functional feet of potential stream mitigation credits in the Middle Potomac-Catoctin Federal HUC-8 Watershed. Sites include Seneca Creek Tributary (CA-5) and Cabin Branch (RFP-2). The remaining mitigation credits will be purchased through the Even Flow Mitigation Bank.

- All streams impacted by the project corridor are classified as Use I or Use I-P, which includes Protection of Nontidal Warmwater Aquatic Life. Off-site compensatory stormwater quality treatment and off-site nontidal wetlands and waterways compensatory mitigation sites impact streams that classified as Use I, I-P, III, III-P, and IV. Proposed stream mitigation sites were chosen based on their potential for ecological uplift, which will enhance the protection of aquatic life.

As demonstrated in this application, Phase 1 South of the MLS project, as proposed, is consistent with applicable Maryland water quality standards. Accordingly, MDOT SHA respectfully requests that MDE issue a water quality certification, consistent with the commitments set forth above.

4 LITERATURE CITED

Center for Watershed Protection (CWP). 2003. Impacts of Impervious Cover on Aquatic Systems. Watershed Protection Research Monograph No. 1.

Herb, William R., Erickson, Timothy O, Stefan, Heinz G. 2009. Stream Temperature Modeling of Miller Creek, Duluth, Minnesota. St. Anthony Falls Laboratory. Retrieved from the University of Minnesota Digital Conservancy. https://hdl.handle.net/11299/117637.

Jones, M.P. Effect of Urban Stormwater BMPs on Runoff Temperature in Trout Sensitive Regions. 2008

Kelly, V.R., Findlay, S.E.G., Weathers, K.C. 2019. Road Salt: The Problem, The Solution, and How To Get There. Cary Institute of Ecosystem Studies.

Maryland Department of Environmental Protection (DEP). 2012. Special Protection Area Program Annual Report 2010. Issued May 14, 2012.

Maryland Department of the Environment (MDE). 2011. 2011 Standards and Specifications for Soil and Erosion Control. In association with Natural Resources Conservation Service and Maryland Association of Soil Conservation Districts.

Maryland Department of the Environment (MDE). 2020. Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated: Guidance for National Pollutant Discharge Elimination System Stormwater Permits.

Maryland Department of Transportation State Highway Administration (MDOT SHA). 2020. 2020/2021 Maryland Statewide Salt Management Plan.

Schueler, T. and Lane, C. 2012a. Recommendations of the Expert Panel to Define Removal Rates for New State Stormwater Performance Standards. Chesapeake Stormwater Network. Approved by WQGIT October 9, 2012 and revised January 20, 2015.

Stranko, S., Bourquin, R., Zimmerman, J., Kashiwagi, M, McGinty, M, and Klauda, R. 2013. Do Road Salts Cause Environmental Impacts? Maryland Department of Natural Resources, Monitoring and Non-Tidal Assessment Division. Annapolis, MD.

Snodgrass, J. W., Moore, J., Lev, S. M., Casey, R. E., Ownby, D. R., Flora, R. F., and Izzo, G. 2017. Influence of Modern Stormwater Management Practices on Transport of Road Salt to Surface Waters. Environmental Science & Technology, 51 (8), 4165-4172. DOI: 10.1021/acs.est.6b03107

The Water Research Foundation. 2020. International Stormwater BMP Database 2020 Summary Statistics.

U.S. Department of Transportation Federal Highway Administration (FHWA) and Maryland Department of Transportation State Highway Administration (SHA). 2020. I-495 and I-270 Managed Lane Study Draft Environmental Impact Statement & Draft Section 4(F) Evaluation. Prepared June 2020.

U.S. Department of Transportation Federal Highway Administration (FHWA) and Maryland Department of Transportation State Highway Administration (SHA). 2022. I-495 and I-270 Managed Lane Study Final Environmental Impact Statement & Draft Section 4(F) Evaluation. Prepared April 2022.

Zeiger, S. J., and Jason A. Hubbart 2015. "Urban Stormwater Temperature Surges: A Central US Watershed Study" Hydrology 2, no. 4: 193-209. https://doi.org/10.3390/hydrology2040193