Maryland Department of the Environment
Water and Science Administration
Basis for Final Determination to Issue National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit for

Maryland Department of Transportation, State Highway Administration
(MDE Permit No. 24-DP-3313, NPDES Permit No. MD0068276)

August 22, 2025

Introduction

This document is the Maryland Department of the Environment's (the Department) Basis for Final Determination regarding the National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) permit for the Maryland Department of Transportation (MDOT), State Highway Administration (SHA). The Department published MDOT SHA's tentative determination MS4 permit (the Draft Permit) on April 19, 2024 to allow public comments for 90 days through July 18, 2024. The federal Clean Water Act (CWA), Code of Federal Regulations (CFR), Environment Article of the Annotated Code of Maryland (Environment Article), Code of Maryland Regulations (COMAR), and guidelines of the U.S. Environmental Protection Agency (EPA) and the Department establish the legal framework for MS4 permits.

Maryland (MD) is delegated the authority by EPA to administer the federal NPDES permit program through a Memorandum of Agreement (MOA) signed in 1974 and reaffirmed on May 18, 1989 (see also, COMAR 26.08.04.07). Phase I of the NPDES MS4 stormwater regulations were adopted by EPA in November 1990 and codified in 40 CFR § 122.26, requiring owners of storm sewer systems serving populations greater than 100,000 to apply for individual NPDES MS4 permits.

MDOT SHA owns or operates municipal separate storm sewer systems that are located in jurisdictions currently regulated under the Phase I and II NPDES programs. Specifically, 40 CFR 122.26 (a)(3)(i) states that "[p]ermits must be obtained for all discharges from large and medium municipal separate storm sewer systems...." Furthermore, the Phase II rule clarified the definition of a MS4 under 40 CFR § 122.26(b)(8)(i), which includes systems that are: "[o]wned or operated by a State, city, town, borough, county, parish district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes….". Therefore, MDOT SHA's roadways and drainage systems located within Maryland municipalities regulated under the NPDES MS4 program are covered under this permit.

The final determination MS4 permit (Final Permit) for MDOT SHA is effective for a five-year term unless administratively continued by the Department. The Final Permit requires MDOT SHA to implement programs and best management practices (BMPs) that reduce the discharge of pollutants in stormwater that flows into, through, or from storm drain systems to the maximum extent practicable (MEP). Public education and outreach, property management, and illicit discharge detection and elimination (IDDE) programs reduce and control the source of pollutants to MDOT SHA's MS4. Erosion and sediment control (ESC) and stormwater management (SWM) programs reduce stormwater and pollutant discharges to MDOT SHA's MS4 from new development and redevelopment through the implementation of BMPs. These management programs, along with restoration and monitoring requirements, provide a comprehensive approach to improve and restore local water resources and the Chesapeake Bay. For a more detailed description of individual programs, a fact sheet for this permit is available on the Department's website at https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/MS4/SHA/MDOT%20SHA%20MS4%20Fact%20Sheet_4-19-2024.pdf.

The Department held numerous meetings with the MS4 community, non-governmental organizations (NGOs), the public, and EPA during the process to develop the draft permit for all jurisdictions regulated as Phase I Large and Medium MS4 permittees. Information gathered during these meetings became the basis for all Phase I final permits, including the MDOT SHA Draft Permit. In addition, the Department incorporated comments received during the tentative determination process into the Final Permit to advance Maryland's efforts to improve water quality and restore the Chesapeake Bay. The Final Permit: establishes impervious acre restoration benchmarks; incentivizes green stormwater infrastructure (GSI) and BMPs with climate resiliency co-benefits; promotes GSI in and outside of communities with environmental justice concerns by requiring MDOT SHA to inventory past GSI[1], assess future opportunities, and make progress implementing additional GSI practices; prioritizes outfall screenings; requires salt management plans to address chlorides; provides an opportunity to participate in pooled monitoring; and incorporates an updated 2021 Accounting for Wasteload Allocations and Impervious Acres Treated (Accounting Guidance) that utilizes the latest science and the Phase 6 Chesapeake Bay Watershed Model.

The following sections review the legal framework that establishes the foundation of MS4 permits and discuss relevant information incorporated into the Final Permit's development process.

Legal Framework for MS4 Permit Requirements. The Department incorporates the legal framework in the CWA, CFR, Environment Article, COMAR, and EPA and Department guidelines to develop MS4 permit requirements. The compliance framework for MS4 permitting

[1] These areas will be identified using the MDE screening tool.

is referred to as the MEP standard and is established under the CWA at 33 USC § 1342(p)(3)(B)(iii). This statute mandates that the Department "require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." The CWA does not define the MEP standard; however, broad discretion is afforded to permitting authorities to set controls they deem necessary to protect water quality.

EPA offered greater clarity regarding the flexibility in determining the MEP standard in MS4 permits when publishing the Phase II NPDES stormwater regulations in the Federal Register on December 8, 1999. 64 Fed. Reg. 68722 (Dec. 8, 1999). Specifically, the EPA did not provide "a precise definition of MEP to allow maximum flexibility in MS4 permitting. MS4s need the flexibility to optimize reductions in storm water pollutants on a location-by-location basis." 64 Fed. Reg. 68754. Therefore, the pollutant reductions that represent MEP may be different between regulated jurisdictions.

On December 9, 2016, the EPA published regulation changes in the Federal Register affecting NPDES small MS4 permits, known as the "Remand Rule" (81 Fed. Reg. 89,320 (Dec. 9, 2016)). The Remand Rule was promulgated in response to a decision from the U.S. Court of Appeals for the Ninth Circuit in *Environmental Defense Center, Inc. et al. v. EPA,* 344 F.3d 832 (9th Cir. 2003). While applicable to small MS4 regulations, the Remand Rule is instructive to permitting authorities for the purpose of determining the MEP standard and establishing permit requirements. Specifically, the Ninth Circuit found that EPA's Phase II MS4 regulations must be revised to preclude permittees from determining their own actions necessary to meet the MEP standard. The preamble to the Remand Rule, 81 Fed. Reg. 89320, 89333 – 89334, explains that these revisions were placed to "reinforce the fact that the permitting authority is the entity responsible for establishing the terms and conditions of the permit necessary to meet the MS4 permit standard." 81 Fed. Reg. 89333. In addition, the Remand Rule clarifies that MS4 permit requirements must be expressed in clear, specific, and measurable terms.

In addition to establishing the MEP standard, the CWA provides that MS4 permits can include requirements that are more stringent than the MEP standard. These requirements often arise from total maximum daily loads (TMDLs) for impaired waters that are approved by EPA after the Department or EPA determines that additional controls are necessary to meet water quality standards. Therefore, 40 CFR § 122.44(d)(1)(vii) states: "when developing water quality-based effluent limits under this paragraph the permitting authority shall ensure that … [e]ffluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation…." Furthermore, regulation changes under the Remand Rule at 40 CFR § 122.34(c) clarify that small NPDES MS4 general permits must include more stringent terms and

conditions, including permit requirements that modify, or are in addition to, the minimum control measures based on approved TMDLs, where the Department determines such terms and conditions are required to protect water quality.

Maryland's MS4 Permits and Judicial Review. The Supreme Court of Maryland (MD Supreme Court), the highest court in the State, has reviewed and upheld three (3) previously issued MS4 permits in *Maryland Department of the Environment v. Anacostia Riverkeeper, et al.,* 447 Md. 88 (2016), *Maryland Department of the Environment v. County Commissioners of Carroll County*, 465 Md. 169 (2019), and *Maryland Small MS4 Coalition v. Maryland Department of the Environment*, 479 Md. 1 (2022). Additionally, the Appellate Court of Maryland reviewed and upheld the 2022 Final Permits for Baltimore County and Baltimore City in its opinion *In the Matter of the Petition of Blue Water Balt., et al.*, 260 Md. App. 246 (2024).

The Final Permit is consistent with these decisions.

Background on Permit Requirements. The Department has carefully developed the Final Permit in consideration of the CWA's legal mandate, applicable case law, and EPA guidance. Accordingly, the Final Permit reflects the MEP standard, as well as effluent limits consistent with applicable TMDLs and wasteload allocations. *See, e.g.,* 40 CFR § 122.44(d)(1)(vii). The Department's decision is also informed by State water quality goals, the mix of available BMPs, public participation, past performance, and analysis submitted by MDOT SHA.

1. *Chesapeake Bay and Local Total Maximum Daily Loads*

   The EPA established the Chesapeake Bay TMDL (Bay TMDL) in 2010 for the six (6) Chesapeake Bay States (Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia) and the District of Columbia. The Bay TMDL describes the level of effort necessary to reduce nutrients and sediments, meet water quality standards, and restore the Chesapeake Bay. The Department has developed a Watershed Implementation Plan (WIP) that assigns pollution load reduction strategies for major source sectors (e.g., wastewater treatment plants, agriculture, stormwater) that contribute pollution to the Chesapeake Bay. The WIP was developed in three iterative phases, each reviewed by EPA. The Department relies on Maryland's WIP to establish NPDES permit requirements consistent with the Bay TMDL.

   Maryland's Phase II WIP established a 20% impervious area restoration goal as an Interim Target Strategy for the stormwater sector to achieve the necessary nutrient and sediment load reductions to meet the Chesapeake Bay TMDL. This 20% impervious area restoration goal was incorporated into prior Phase I MS4 permits as a requirement to ensure continued

progress toward reducing pollution from the MS4 sector consistent with the Bay TMDL. The Phase I MS4 permits were affirmed by the MD Supreme Court. In its decision, the MD Supreme Court referred to the WIP as a "well-developed and vetted strategy" for the purpose of helping to restore the Chesapeake Bay. *Anacostia Riverkeeper*, 447 Md. at 127.

Maryland's Phase III WIP provides updated restoration strategies to make continued progress toward reducing pollution consistent with the Bay TMDL. The Department incorporates these strategies when determining restoration requirements for reissued Phase I MS4 permits. Specifically, the Final Permit requires MDOT SHA to perform restoration and implement BMPs that are proven to address other local TMDL impairments, such as nutrients, sediments, trash, polychlorinated biphenyls (PCBs), bacteria, biochemical oxygen demand (BOD), and mercury. The restoration required in the Final Permit is also cumulative: it builds on prior restoration required under MDOT SHA's prior MS4 permits and requires MDOT SHA to maintain or replace BMPs implemented in prior permits. Accordingly, compliance with restoration criteria and management programs, outlined in the Final Permit, constitutes adequate progress toward compliance with Maryland's receiving water quality standards and EPA-approved stormwater WLAs for the Bay TMDL.

2. *Chesapeake Bay Program Partnership*

The Department is a partner with the Chesapeake Bay Program (CBP), which is dedicated to advancing restoration initiatives in the Chesapeake Bay. The CBP Partnership provides technical support for TMDL development, local restoration implementation, and tracking progress toward pollutant reduction goals. The Department's participation includes membership on the Water Quality Goal Implementation Team (WQGIT) and the Urban Stormwater Workgroup (USWG). The CBP Partnership uses a science-based approach that identifies best practices to reduce pollutants from stormwater runoff. The CBP Partnership includes all jurisdictions within the Chesapeake Bay watershed, ensuring that technical standards are implemented consistently across the region.

The CBP Partnership convenes expert panels that undertake a scientifically rigorous review of proposals for new or updated BMPs. The expert panel reports provide recommended pollutant reductions achieved by specific BMPs and are subject to approval by the USWG and WQGIT. These reports include BMP design criteria that must be met to achieve pollutant reductions. The Department relies on the CBP expert panel recommendations to develop criteria for acceptable BMP implementation and credits to meet restoration requirements.

3. *Maryland and CBP BMP Design Criteria and Performance Standards*

The Final Permit requires MDOT SHA to implement a stormwater management program in

accordance with the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland and COMAR 26.17.02 to address discharges from new development and redevelopment projects. Therefore, implementation of the Final Permit is tied to the administration of well-established State stormwater programs. The State's Stormwater Management Law, passed in 1982, requires the management of stormwater runoff to maintain after development, as nearly as possible, the pre-development runoff conditions. Over the years, this program has undergone significant revisions and enhancements. The 2000 Maryland Stormwater Design Manual, Vol. I & II (the Design Manual) was developed to establish minimum performance standards for stormwater management for new development. The Stormwater Management Act of 2007 advanced Maryland's stormwater program by establishing requirements for environmental site design (ESD) to the MEP. These requirements incorporate improvements including the use of natural drainage patterns, vegetation, and non-structural and small-scale practices to manage stormwater runoff effectively at its source. Combined with other permit requirements, these controls address the discharge of pollutants from new development and redevelopment to the MEP. The criteria for acceptable new development and redevelopment BMPs are based on the water quality treatment standards in the Design Manual.

In addition to the suite of practices noted in the Design Manual, the Department has developed the 2021 Accounting Guidance to provide a comprehensive set of tools that MS4-permitted jurisdictions can use to achieve restoration requirements. The Accounting Guidance is based on engineering principles and scientific research that document BMP efficiencies for nutrient and sediment reduction in accordance with CBP WQGIT-approved Expert Panel Reports. The Accounting Guidance includes alternative BMPs such as stream restoration, tree planting, street sweeping, and shoreline management. The CBP-approved pollutant load reductions for these practices provide the basis for determining equivalent impervious acre (EIA) credits that are used to achieve compliance with the Final Permit's restoration requirements. The EIA credits for the alternative practices are specified in the Accounting Guidance.

4. *Jurisdiction-Specific Determination of Restoration Requirements*

As noted above, the permitting authority is responsible for establishing the terms and conditions necessary to meet the MEP standard and to protect water quality. As part of this process, the Department provided guidance for MDOT SHA to submit data reflecting restoration capabilities. MDOT SHA's submission included a Restoration Project Portfolio (BMP Portfolio) and Physical Capacity Analysis (PCA).

The BMP Portfolio included a comprehensive list of restoration projects to be planned, designed, and constructed during the Final Permit's term. The BMP Portfolio included project-specific information on nutrient reductions and impervious acres treated. MDOT

SHA also submitted a PCA to the Department. The PCA considered various limitations such as constraints on procurement and permitting, budget approvals, availability of contractors, project scheduling, and project complexity. MDOT SHA was not required to submit a Financial Capacity Analysis because MDOT SHA as a State agency is not in control of the funds that are directed to them and instead relies on funding allocated through the State budget process. The Department reviewed this information and the analysis verified that proposed BMPs were in conformance with the Accounting Guidance; assessed the potential for additional credits; and evaluated consistency with Chesapeake Bay restoration goals. The results of this analysis and consideration of the pollutant reduction goals in the Phase III WIP were used to inform the Department's determination of MDOT SHA's impervious surface restoration (ISR) requirement.

Administrative Process. The Department published a tentative determination to issue MDOT SHA's NPDES MS4 permit on April 19, 2024 (the Draft Permit). Public notice of the Department's tentative determination appeared in the Baltimore Sun and Washington Post on April 19 and 26, 2024. Additionally, the Department maintains an interested party list for NPDES MS4 permits that includes federal, State, and local municipal officials, NGOs, and numerous citizens. Individuals on this list were notified by email of the tentative determination on April 19, 2024.

The public notice included a public hearing date to allow any interested person to testify and/or submit written comments on the Department's tentative determination to issue the Draft Permit. The Department held the public hearing to accept testimony and comments regarding MDOT SHA's Draft Permit on June 4, 2024. At the hearing, testimony was given by eight members of the public. The transcript and video recording of the proceedings for each public hearing is available on the Department's website at mde.maryland.gov/programs/water/StormwaterManagementProgram/Pages/storm_gen_permit.aspx.

After the hearings, the public comment period for the Draft Permit remained open through July 18, 2024 to accept public comments. At the end of the comment period, the Department received comments from: the Chesapeake Bay Foundation; the Coalition to Stop Stream Destruction; Contech; Eyes of Paint Branch; Friends of Sligo Creek; the Maryland Sierra Club; Protect Our Streams; Public Employees for Environmental Responsibility; the Maryland Municipal Stormwater Association (MAMSA); and 26 NGOs that co-signed with the Chesapeake Legal Alliance. The Department also received comments from Maryland State Delegates Jennifer R. Terrasa, Sheila S. Ruth, and Mary A. Lehman, and 83 local residents.
The comments raised certain issues including environmental justice (EJ), climate change, the ISR metric, the MEP standard, anti-backsliding, TMDLs, the BMPs outlined in the Accounting Guidance, nutrient trading, monitoring requirements, the availability of federal funds, the

Department's "Advancing Stormwater Resiliency in Maryland"[2] (A-StoRM) action plan to address climate change, and enforcement. These comments were similar to comments that the Department received previously and addressed in its "Basis for Final Determinations to Issue National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permits for Anne Arundel County, Baltimore City, Baltimore County, and Montgomery County"[3] (2021 Basis for Final Determinations), "Basis for Final Determination to Issue National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit for Prince George's County, and its "Basis for Final Determinations to Issue National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permits for Carroll, Charles, Frederick, Harford, and Howard Counties"[4] (2022 Basis for Final Determinations). Additional comments on the Draft Permit raised further concerns related to MDOT SHA's ISR requirements, stream restoration, public participation, erosion and sediment control, green stormwater infrastructure, salt management, and monitoring for PFAS, PCBs, and temperature. The Department's response to comments is below.

Response to Comments

1. Global Issues

The Department received comments requesting that environmental justice and climate change be emphasized in various permit requirements (e.g., impervious surface restoration or "ISR", TMDLs, BMPs). A comment requested that the Department mandate environmental justice and climate change as determining factors in the design and location of local restoration efforts.

Environmental Justice. The Department is committed to promoting environmental justice, the concept that all people – regardless of race, color, national origin, or income – are able to enjoy equal environmental protection. The Department received comments expressing concerns that marginalized communities lack green spaces and green infrastructure. These comments allege that the Draft Permit does not include restoration requirements that will specifically seek to

[2] "Advancing Stormwater Resiliency in Maryland (A-StoRM) Maryland's Stormwater Management Climate Change Action Plan", MDE, November 5, 2021.

[3] "Basis for Final Determinations to Issue National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permits for Anne Arundel County, Baltimore City, Baltimore County, and Montgomery County", MDE, November 5, 2021.

[4] "Basis for Final Determinations to Issue National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permits for Carroll County, Charles County, Frederick County, Harford County, and Howard County", MDE, December 30, 2022.

improve communities with environmental justice concerns. One commenter argued that the Draft Permit fails to align with the State's EJ goals. Conversely, another commenter asserted that the Department has no authority to include EJ requirements in the Draft Permit, GSI is not always needed for restoration in communities with environmental justice concerns, and the MDE screening tool does not have a water quality focus and instead local EJ data should be used.

One comment suggested that the Department "include provisions in this permit to … equalize the distribution of … benefits from restoration efforts." The commenter added that historically marginalized communities should be accounted for in permit implementation "through robust and inclusive public outreach efforts" and urged the Department to incorporate the Report of the Senate President's Advisory Workgroup on Equity and Inclusion (available at mgaleg.maryland.gov/pubs-current/SenatePresidentAdvisoryWorkgrouponEquityandInclusion.pdf). This report recommended more trees in urban communities, "the use of environmental justice data [in the Department's] daily operations … [and] further investigation into programs and policies that promote green infrastructure in…urban communities" with environmental justice concerns.

The Department's mission is to protect and restore the environment for the health and well-being of all Marylanders. The Department is committed to responding to the local and nationwide call to address environmental justice throughout its authority. Further, as the lead agency staffing the Commission on Environmental Justice and Sustainable Communities (CEJSC), the Department is engaged in a dialogue with communities to learn about environmental health concerns as well as locally identified solutions. Additionally, the Department is actively developing policies that prioritize equity during engagement, permitting, and compliance. More information on environmental justice implementation at the Department can be accessed on the Department's website at mde.maryland.gov/programs/crossmedia/environmentaljustice/Pages/index.aspx.

The Final Permit incentivizes and supports actions by MDOT SHA and community leaders that collaborate to prioritize restoration in communities with environmental justice concerns. These areas will be identified using the MDE screening tool. For example, the Final Permit requires that MDOT SHA inventory previous GSI restoration implemented in communities with environmental justice concerns and assess opportunities for additional GSI in these areas. The Final Permit also requires that MDOT SHA report on what GSI will be completed in these communities by the end of the permit term and proposed projects to implement during the next permit term. These requirements do not mandate that restoration occur in these areas, but they do require that MDOT SHA consider such areas for planning purposes and document what is being done to ensure that the benefits of restoration are enjoyed equally by all Marylanders. The Final Permit allows MDOT SHA the flexibility to implement green infrastructure in communities with environmental justice concerns, including BMPs such as urban soil restoration, urban tree

canopy planting, street trees, impervious surface reduction, and street sweeping. Additionally, the Final Permit requires continual outreach to solicit public input regarding restoration plans (PART IV.D.5 Public Education; PART IV.F.4 Stakeholder Outreach on Stormwater TMDL Implementation Plans) to foster inclusion.

One commenter stated that the Department posting environmental justice scores as required by the Environment Article §1-601.1 did not do enough to assess how runoff from MDOT SHA property impacts communities with environmental justice concerns, or make a "commitment to focusing resources, such as BMP implementation, in the places needed to protect the communities." The procedures followed for the tentative determination, including the public noticing and public hearing, were consistent with COMAR 26.08.04.01-2. The Department reviewed and verified MDOT SHA's submittal and the information is publicly available which is consistent with requirements under Environment Article §1-601.1.

Some commenters representing local jurisdictions argued that GSI is not always appropriate in certain communities and BMPs implemented upstream may be more beneficial. However, the Final Permit encourages MDOT SHA to plan and implement GSI that will benefit communities with environmental justice concerns using the MDE screening tool, whether implemented in these communities or in upstream drainage areas. The Final Permit also allows MDOT SHA the flexibility to partner with surrounding MS4s and incorporate local knowledge into implementation efforts.

In addition to green infrastructure, the Department encourages planning and implementation that integrates the social and environmental co-benefits of restoration efforts along with local goals and infrastructure improvements. For example, the Final Permit requires MDOT SHA to use the Accounting Guidance, which promotes flexibility to implement projects that meet multiple local planning goals (see Part 6. Best Management Practices). Therefore, the Final Permit's requirements promote opportunities consistent with the Department's mission to emphasize environmental protection for all communities.

The Department is also working with federal agencies and local governments to continue to improve the understanding of and response to equity in environmental permitting.

Climate Change. The Department recognizes the urgency needed to address climate change. The Final Permit empowers MDOT SHA to build infrastructure that meets both today's storm conditions and accounts for future climate conditions with more intense events. The Department is committed to adapting Maryland's stormwater program to address these challenges. Nevertheless, the Department received comments on the Draft Permit alleging that the Department does not take climate change into consideration.

The Department is working with the regulated community to develop changes to the State's stormwater management regulations that address climate change and promote resilient stormwater implementation. The first phase of this effort includes incorporating the most recent precipitation data, updating environmental site design (ESD) sizing criteria, and evaluating local quantity management requirements. This approach is consistent with recommendations in the CBP Memo, "Review of Current Stormwater Engineering Standards and Criteria for Rainfall and Runoff Modeling in the Chesapeake Bay Watershed" (see Wood, D. 2020): acquiring the most up-to-date precipitation data and science is an important first step to address the impacts of climate change.

The stormwater management and erosion and sediment control programs are incorporated by reference into the permit, therefore any updates, including regulatory changes and guidance to address climate change will be subject to NPDES MS4 permit requirements. This may be done by modifying the Final Permit to incorporate new regulations and standards as provided in Part VII.H.1.

The approach noted above is consistent with the Baltimore County and Baltimore City permits issued in 2021. In challenges to those permits, environmental advocates argued "that the [2021 Baltimore County and City] permits are ineffective because the Department failed to include 'climate change related conditions.'" However, the Appellate Court of Maryland reviewed identical arguments challenging the Department's final determinations to issue these permits and ruled in favor of the Department. *See, e.g.*, *Matter of Blue Water Baltimore, Inc.*, 260 Md. App. 246 (2024).

1. *Climate Change and the Phase III WIP*

   Maryland is committed to restoring the Chesapeake Bay and has a robust strategy to achieve nutrient reduction goals. One comment asserted that nutrient and sediment loads are increasing because of climate change. This commenter further stated that the Draft Permit does not account for these increases, so Maryland is not on track to meet goals established in the Phase III WIP. The commenter asserts that the State must accelerate stormwater pollution reductions and revisit the restoration requirements established in the Draft Permit.

   The Department addresses nutrient planning targets projected for climate change in the Phase III WIP. Specifically, the Phase III WIP strategy "surpasses the statewide nitrogen and phosphorus targets by 1,000,000 pounds per year and 440,000 pounds per year, respectively. Reductions achieved beyond the targets will be used to meet future reduction requirements, including those due to climate change." (See Chapter IV, pp. 31-32). The surplus reductions in the Phase III WIP were adopted to compensate for the inherent uncertainty of projecting future pollutant loading increases. These additional nutrient and sediment reductions were

applied across all sectors, including each MS4 Phase I stormwater permit. The Department's approach balances the uncertainty of future projections with current, available data consistent with the Department's iterative process to ensure progress towards improving water quality.

2. *Flooding*

The Department received comments on the Draft Permit suggesting that climate change will reduce BMP design efficiency and contribute to the failure of local stormwater infrastructure. The comments tie these arguments to alleged flooding that the commentor contends contributes nutrient pollution to receiving waters. For this reason, the commenter recommends that the Department incorporate design changes into the Draft Permit to address climate change and flooding. Commenters also suggested the Draft Permit be revised to require MDOT SHA to track flood events that occur and impact BMP function.

Addressing public health and safety concerns associated with flooding and climate change is a top priority for the Department. To address local flooding and its associated water quality impacts, a comprehensive watershed approach is needed that characterizes existing stormwater conveyance systems, determines where upgrades are needed, identifies regional management solutions, and develops alternative management strategies including watershed specific stormwater management criteria for land development projects. This approach is complex and involves many local and State programs and agencies, in addition to the MS4 permitting program. The Department has initiated an effort to address climate change on a watershed scale. This effort includes updating the statewide stormwater management program.

The Department published the Advancing Stormwater Resiliency in Maryland (A-StoRM) report in November 2021. The A-StoRM report was required by the General Assembly in Senate Bill 227, enacted during the 2021 legislative session, and is codified at Section 4-203(b)(4) of the Environment Article. Consistent with this statute, the A-StoRM report describes the Department's plans to examine recent precipitation data and evaluate potential updates to quantity control standards in certain watersheds along with other regulations adopted under Section 4-203 of the Environment Article.

The Department is currently moving forward with the strategies outlined in the A-StoRM report and working in partnership with other jurisdictions to update rainfall data from the National Oceanic and Atmospheric Administration (NOAA). Once these data are updated, the Department will evaluate them in tandem with its ongoing strategies under the A-StoRM report.

The Department is also studying where flooding is occurring as part of the process outlined above. However, the scope and extent of the problem must be identified before solutions can be evaluated. Once the Department determines the appropriate solutions, those solutions will be implemented via appropriate means (e.g., rulemaking, guidance).

However, some of the comments contend that the Department ignores its own recommendations found in the A-StoRM report by taking insufficient steps to mitigate the effects of climate change in the Draft Permit. The Department counters that it is inappropriate to include requirements in the Final Permit before the issue(s)—that will be addressed through the above-described actions—are evaluated and the impact(s) and consequences of these requirements are fully understood and articulated appropriately through guidance, updated design computations, rulemaking, and/or other processes. Any requirements or actions for addressing climate change must understand the scope of the problem(s) and consider the benefits and unintended consequences of proposed actions. This process is discussed in the A-StoRM report and is ongoing.

Accordingly, the Department has not added specific climate change provisions in the Final Permit as suggested by commenters. This does not mean that actions or regulatory changes implemented as a result of the State's ongoing efforts are ignored or disregarded. In fact, any changes to the State's stormwater management program will be incorporated into the Final Permit under PART IV.D.1. This includes any final regulatory actions such as updated stormwater management standards or other regulatory changes to address climate change impacts. The Department may modify the Final Permit to incorporate new regulations or standards under PART VII.G.1. of the Final Permit.

2. Impervious Surface Restoration

The Final Permit establishes ISR requirements with associated pollutant reductions that are consistent with Maryland's Phase III WIP for the Chesapeake Bay TMDL and 2025 nutrient and sediment load targets. When developing the Phase III WIP, the Department used the impervious surface metric, which was established in previous MS4 permits, supported by EPA, and upheld by the MD Supreme Court (see discussion below), to define an annual pace of restoration implementation. Comments expressed concerns regarding the ISR metric, urging that it be replaced with numeric nutrient and sediment load reductions. Other commenters requested that the Final Permit include specific amounts of green stormwater infrastructure to be implemented for the ISR requirement. The Department also received a comment requesting a minimum of

BMPs that reduce stormwater and a maximum for those BMPs that the commenter believes are less beneficial for controlling stormwater. Lastly, the Department received a comment requesting that the Final Permit require 20% ISR.

Impervious Surface Restoration is an Appropriate Water Quality Surrogate.
Certain comments stated that the ISR metric should be replaced. Specifically, one commenter argued that the ISR metric is flawed and should be replaced with numeric pollution reduction requirements. In lieu of the ISR metric, the commenter suggested that the Department establish an alternative approach to meet wasteload allocations (WLAs) that does not rely on impervious surface restoration. The Department disagrees with these suggestions.

The ISR metric is an appropriate metric for the Final Permit. An EPA memorandum, "Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs" by Sawyers and Best-Wong, 2014 (available online at https://www3.epa.gov/npdes/pubs/EPA_SW_TMDL_Memo.pdf), promotes Maryland's use of the ISR requirement in MS4 permits as a model example for establishing numeric effluent limitations to meet water quality and TMDLs. The Department's approach is also supported by other EPA guidance for permitting authorities to address TMDLs and WLAs in stormwater discharges. These guidance documents recognize the impervious cover surrogate as an appropriate, clear, measurable, and enforceable metric to address water quality-based effluent limits (WQBELs). For example, in the EPA memorandum "Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs" (Hanlon and Keehner, 2010 and available online at www3.epa.gov/npdes/pubs/establishingtmdlwla_revision.pdf), EPA promotes impervious surface restoration as a "more straightforward way to regulate stormwater contributions to waterbody impairment." Additionally, EPA has approved Maryland's MS4 permits that incorporate the ISR requirement. Therefore, the ISR metric is an appropriate metric to establish effluent limits in MS4 permits.

The MD Supreme Court upheld the Department's approach of using an ISR surrogate for reducing pollution discharges in *Maryland Department of the Environment v. Anacostia Riverkeeper, et al*. Specifically, the Court noted that "it is through restoring impervious surfaces with management practices that the Counties will reduce pollution." *Anacostia Riverkeeper*, 447 Md. at 123. The Court also noted that "MDE chose a standard that relates to the very problem the 20% restoration requirement serves to abate: the increase in stormwater runoff and the discharge of pollutants because of the increase in impervious surfaces." *Anacostia Riverkeeper*, 447 Md. at 125. The ISR strategy is a clear, specific, and measurable metric to address TMDL WLAs.

Impervious Surface Restoration Strategy and Nutrient and Sediment Load Reductions.
Comments related to the ISR requirement contend that this strategy allows MDOT SHA to implement practices that do not adequately contribute to water quality goals. For example, one comment stated that the Draft Permit does not actually have specific nutrient pollutant load

reductions, and only has the ISR standard, which can be met in a variety of ways, some of which are unrelated to stormwater. The commenter also suggested that the ISR metric is insufficient to reduce stormwater pollution to ensure adequate water quality protection and should be replaced.

The ISR metric is supported by incorporation of the Design Manual, Accounting Guidance, and related documents into the Final Permit. These documents establish the effectiveness of BMPs and related practices recognized by the CBP and the Department, and are supported by the best available science, thereby ensuring MDOT SHA's ISR strategies will be effective and measurable. The Final Permit further requires MDOT SHA to monitor (PART IV.G) and maintain or replace these practices (PART IV.D.1.d, PART IV.E.1, PART VII.F) to ensure their continued efficacy. These requirements ensure that MDOT SHA's restoration is cumulative and additive—building on prior restoration efforts to increase the total amount of impervious area restored while maintaining prior restoration consistent with TMDL WLAs.

The Department received comments that MDOT SHA should restore 20% of the impervious acre baseline versus the 11% (or 3,046 impervious acres) required in the Draft Permit. Specifically, the commenter noted that the prior permit required 20% ISR and contended that reducing this amount would roll back progress that is needed to meet projections that pollutant loads from the stormwater sector will continue to increase as development continues to occur in the State of Maryland. While the 11% ISR is consistent with the assumptions of the Bay TMDL and the MDOT SHA BMP portfolio submitted prior to the Tentative Determination, the Department met with MDOT SHA to discuss these comments. As part of these discussions, MDOT SHA indicated a desire to lead by example based on the most recent State budgetary projections: increasing the ISR commitment to 15% during the next permit term. Thereby, reducing more pollutants from the stormwater sector toward the restoration of the Chesapeake Bay. Accordingly, the Final Permit will require MDOT SHA to restore an additional 15% ISR during the next permit term, or 4,092 impervious acres during the permit term. The Final Permit will require MDOT SHA to verify that restoration BMPs achieve pollutant load reductions in accordance with the 2021 Accounting Guidance.

The ISR requirement will result in BMP implementation and pollutant load reductions from stormwater discharges. Affirming the Department's approach of using the impervious surface restoration surrogate, the MD Supreme Court noted that, by incorporating the Design Manual into the Phase I MS4 permits, the ISR requirement ensures implementation of BMPs with specific design and performance standards that result in reduction of pollution discharges.

See Anacostia Riverkeeper, 447 Md. at 122-23, 125-26. Additionally, the MD Supreme Court recognized that incorporating the Accounting Guidance allows permittees to "assess progress in achieving WLAs and also assess restoration of impervious surface areas through a credits-to-acres approach." *Anacostia Riverkeeper*, 447 Md. at 109. This approach is consistent with the

Department's iterative process for continual, ongoing progress to attain water quality standards. Further discussion related to specific BMP implementation for ISR requirements is provided in Section 6 of this Response to Comments document.

The Final Permit Requires Restoration Using GSI. Some commenters requested a minimum amount of GSI implementation during the permit term, and some commenters contend that the permit should specify "the number, type, and location of green infrastructure practices". The Department disagrees that more specific numbers are needed in the permit. The Final Permit requires that MDOT SHA inventory previous GSI restoration, assess opportunities for additional GSI, report on what GSI will be completed by the end of the permit term, and propose projects to implement during the next permit term. This allows MDOT SHA to plan for GSI implementation in strategic locations to address local TMDLs and/or the Bay TMDL while simultaneously benefitting local communities. Furthermore, MDOT SHA's MEP Submission stated "SHA began investigating ways to diversify its restoration BMP portfolio by implementing new BMP types recently made creditable for MS4/TMDL compliance with MDE issuance of its 2021 MS4 Accounting Guidance (MDE, 2021) such as the Forest Conservation, Riparian Forest, and Conservation Landscaping land conversion BMP types that have not previously been implemented by SHA for MS4 permit or TMDL compliance."

3. MEP Analysis and Permit Requirements

Comments questioned the Department's approach for using an MEP analysis when determining the ISR requirement. However, the Department has developed a process to assess each jurisdiction's ability to implement restoration projects: this process was applied to the Draft Permit. The Department's analysis and subsequent determination of requirements in the Final Permit is also consistent with guidance from EPA, the Department, the CWA, and case law.

Maryland Supreme Court Ruling and MEP. One comment expressed concern that the Department's MEP analysis is counter to existing law. This commenter stated: "[t]he MEP standard represents the minimum amount of pollution reduction that the Department must require. If additional reductions are needed to meet water quality standards, including through TMDL implementation, then the Department must impose additional pollution reduction requirements, which could take the form of an additional ISR requirement." The commenter further stated it is "counter to the Court's holding to now claim that the MEP standard controls and constrains the Department's water quality-based ISR condition in the Permit."

The MD Supreme Court's ruling in *Department of the Environment v. County Commissioners of Carroll County,* 465 Md. 169, 222-25, 238 (2019), authorizes the Department to include water quality-based effluent limits in MS4 permits in addition to limits established according to the MEP standard. However, imposing water-quality based effluent limits in addition to the MEP-

based limits is not mandatory, but only necessary where needed to comply with water quality standards (derived from the assumptions and requirements of a TMDL).

Accordingly, the Department developed permit conditions according to the MEP standard and consideration of the Phase III WIP goals. Specifically, the Phase III WIP strategy for meeting pollution reduction targets is for all Phase I MS4 permittees to restore 2% of untreated impervious area per year or 10% during the permit term. Accordingly, this amount of ISR requirement would be 2,728 acres. The Draft Permit exceeded that amount and therefore is consistent with water quality goals derived from the assumptions and requirements of the Bay TMDL. However, after discussions with MDOT SHA as noted above, the Final Permit now requires 15% during the permit term. This amount of ISR requirement is 4,092 acres.

Stakeholder Process During Permit Development. The Final Permit is one among eleven (11) Phase I MS4 permits issued by the Department in the past three years, and the Department evaluated each of these MS4 permits individually and in tandem with the other MS4 permits to ensure consistency with the Phase III WIP and the Bay TMDL. The Department solicited information and input from regulated jurisdictions and interested parties regarding ideas, concerns, and available data related to restoration implementation. These discussions were an open, ongoing dialogue relating to restoration practices and permit requirements. The Final Permit reflects the Department's conclusions, which balance suggestions from the regulated community and environmental NGOs while ensuring consistency with applicable TMDL WLAs and the Phase III WIP.

Scope and Purpose of BMP Portfolio Reviews. The Department received comments alleging that the BMP Portfolio review process was inappropriate, and further alleging that the Department did not use proper authority under the CWA to issue a Draft Permit that is both protective of water quality and practicable to implement. These comments contended that the MEP analysis should not be limited to fiscal analysis and should be science-based with greater focus and attention to water quality impacts. Contrary to these comments, the MEP analysis was not limited to a fiscal analysis and MDOT SHA was not required to submit a fiscal capacity analysis. MDOT SHA as a State agency is not in control of the funds that are directed to them and instead relies on funding allocated through the State's budget process. Furthermore, the Department's analysis was consistent with the authority granted under the CWA and EPA guidance. Among the factors considered as part of the MEP analysis, MDOT SHA's physical capacity, opportunities for BMP implementation, and commitments to maintain BMPs implemented in the previous MS4 permit were evaluated. The Department also reviewed MDOT SHA's BMP Portfolio for consistency with the Phase III WIP pollution reduction targets in tandem with the other Phase I Large and Medium MS4 permits. Each of these factors is appropriate when determining permit requirements and consistent with EPA's recommendations.

See, e.g., 64 Fed. Reg. 68,754. However, as noted above, the Department's analysis also considered other factors as well as pollution reduction goals for meeting Chesapeake Bay Phase III WIP targets.

Specific elements of the Department's review of MDOT SHA's MEP submittal included the following:

- Confirmation that appropriate crediting methodologies from the Accounting Guidance were proposed and that practice-specific data supported the nutrient reductions reported;
- Local water quality objectives and TMDL goals addressed by the suite of proposed BMPs;
- The types of practices, pace of implementation, total cost, and cost per acre of proposed restoration versus the previous Phase I MS4 permit;
- Project scheduling, budget process, and contracting limitations;
- The cost of maintaining existing BMPs implemented under previous MS4 permits; and
- The cost of program initiatives and BMP implementation necessary to meet other MS4 permit requirements.

In addition to the above criteria, the Department's determination of MDOT SHA's restoration requirement also examined the State's pollution reduction goals outlined in the Phase III WIP. The review process noted above is consistent with the Phase III WIP strategy which describes the MEP analysis as a component of the process to determine the ISR requirement. Therefore, page B-33 of the WIP strategy notes the following:

> "Recent MS4 implementation and trend analysis indicates that permittees (nine counties, Baltimore City and the MDOT SHA) should be capable of annually restoring two percent of their impervious surface areas that currently have little or no stormwater treatment. While this level of implementation will be used in the Phase III WIP analysis for estimating load reductions, the Department will continue to work with permittees on an MEP analysis that will indicate what is feasible. This MEP analysis will take into consideration the physical and financial capacity of a jurisdiction to perform restoration, and the need for making significant and continual progress toward Bay and local water quality improvements. The analysis will also consider the impact of updated BMP efficiencies approved by the CBP Partnership. Permittees will also have the flexibility to meet a portion of their restoration requirements through water quality trading. As progress must continue past 2025 for certain sectors to meet the WLAs assigned in the Bay TMDL, it is anticipated that significant restoration requirements will be maintained in the sixth- and seventh-generation permits." This will incorporate the latest information available for the Department to determine MEP for MDOT SHA at the outset of each permit term.

One commenter expressed that the Final Permit should account for goals beyond 2025, while environmental NGOs argued that the Draft Permit's reference to the Aligning for Growth Policy is not sufficient because this group has not developed any policies. Any change in goals will be reflected in subsequent permits.

Permittee Specific Pollution Control Requirements. Some of the comments suggested that the Draft Permit's ISR requirement is not consistent with the Phase III WIP. The EPA provides specific guidance that clarifies the flexibility afforded to permitting authorities when developing MS4 permit provisions. Specifically, EPA states that "MS4s need the flexibility to optimize reductions in storm water pollutants on a location-by-location basis." 64 Fed. Reg. 68,754. EPA then describes the factors that permitting authorities should consider when evaluating the MEP standard. These factors include but are not limited to specific local concerns, water quality conditions, ability to finance the program, and capacity to perform operation and maintenance. 64 Fed. Reg. 68754. The Department's decision-making included a wide range of factors, scientific documentation, and numerous stakeholder meetings over a three-year period. Therefore, the Department's review of MDOT SHA's MEP submittal is consistent with EPA guidance and considered Permittee-specific data to tailor restoration requirements to meet Maryland's pollution reduction goals outlined in the Phase III WIP.

With respect to concerns related to pollutant load projections associated with increased development, the Phase III WIP is based on projected 2025 land use. Therefore, growth is already built into the strategies for meeting WIP pollution reduction goals. As noted below, the Department's determination of an appropriate ISR for each MS4 Permittee is consistent with the assumptions and requirements of the Phase III WIP. An additional discussion on anti-backsliding and determination of ISR requirements is provided below.

MEP Analysis. MDOT SHA submitted a BMP Portfolio detailing the restoration projects to restore 2,871 acres through upland and alternative practices. The portfolio may be accessed here: https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/MS4/SHA/SHA_MEP_Analysis_03.22.2024.pdf. The Department compared the BMP Portfolio with the pollution load reduction targets for the Bay TMDL established in the Phase III WIP. The Department also reviewed the Portfolio for additional opportunities for pollution reductions. Several factors led to the decision that more restoration was achievable. In making this determination, the Department examined the following:

- MDOT SHA may use additional green infrastructure and watershed management credits above what was reported in its BMP Portfolio. These additional credits will become available as MDOT SHA implements adaptive management strategies to maximize the use of these practices.

- MDOT SHA can utilize new BMPs from the updated Accounting Guidance (e.g., urban soil restoration, floating treatment wetlands, riparian buffers, forest conservation) in addition to the BMPs submitted in the BMP Portfolio.
- Redevelopment credits were not identified in MDOT SHA's BMP Portfolio. The Department has determined that additional credits may be available for future redevelopment projects that comply with Maryland's stormwater regulations.

Based on the MEP analysis described above, the Department proposed an ISR requirement of 11% for the Draft Permit. While the 11% ISR is consistent with the assumptions of the Bay TMDL and the MDOT SHA BMP portfolio submitted prior to the Tentative Determination, the Department met with MDOT SHA to discuss concerns submitted during the public process. As part of these discussions, MDOT SHA indicated a desire to lead by example and has committed to completing 15% during the next permit term. Therefore, the Final Permit will require MDOT SHA to restore an additional 4,092 impervious acres during the permit term.

Maryland's Iterative Process Toward Meeting Water Quality Goals. EPA states that MEP in reissued MS4 permits is iterative and "should continually adapt to current conditions and BMP effectiveness and should strive to attain water quality standards. Successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards." 64 Fed. Reg. 68,754. The Department's comprehensive review of MDOT SHA's MEP submittal recognizes that pollution controls will be installed that are additional to controls implemented in prior permits. Therefore, the Department's approach is to issue a permit that builds on pollution reductions previously achieved, adapts to current conditions, and reflects permittee-specific considerations. This approach is consistent with federal guidelines and recognizes that pollutant reductions from ISR requirements will be different among the regulated jurisdictions.

The Department has determined that Maryland's two percent per year goal identified in the Phase III WIP to achieve pollution reduction targets will be met and exceeded by MDOT SHA. This strategy, along with the local data that show restoration capacity for individual jurisdictions, was used to determine the collective load reductions achieved under the Final Permits for the Phase I jurisdictions. This ensures consistency with the State's goals established in the Phase III WIP.

Collectively, the level of restoration for the 11 reissued Phase I MS4 permits will exceed the Phase III WIP goal, resulting in cumulative restoration of 2.3% per year of all Phase I jurisdictions' untreated impervious area (See Table 1). The Department's process for establishing ISR requirements considered each jurisdiction's data and ensured consistency with the Phase III WIP goals. The Phase III WIP also specifies that significant restoration requirements will continue in future MS4 permits. Therefore, the Department's approach is consistent with the

Phase III WIP goal to make continuous progress toward achieving water quality standards in each successive iteration of MS4 permits.

Table 1. Impervious Surface Restoration (ISR) Requirements

Phase I MS4	ISR Requirement in Permit (Acres)		ISR Goal from State Phase III WIP (Acres)
	Acres	Percent of Baseline	
MDOT SHA	4,092	15.0%	2,728
Anne Arundel	2,998	12.0%	2,498
Baltimore City	3,696	17.2%	2,146
Baltimore	2,696	8.9%	3,018
Carroll	1,217	15.1%	807
Charles	1,083	13.7%	789
Frederick	1,027	10.4%	991
Harford	1,093	10.0%	1,093
Howard	1,345	12.2%	1,102
Montgomery	1,814	9.6%	1,889
Prince George's	2,137	7.0%	3,053
Total	23,198	11.5%	20,114

Additional Funding. One comment noted that, because of recent federal legislation, there may be additional funding available for restoration. This commenter noted that there has been an increase in federal funding that MS4s may use to invest in infrastructure improvements. The commenter also suggested that MDOT SHA's ISR should be increased to reflect this new potential funding, and that it is wrong to suggest MEP has declined because "over the last decade … Maryland's budget, economy, and population have increased significantly".

As discussed above, the Final Permit's ISR requirement considers MDOT SHA's MEP submission and the Phase III WIP strategy to implement the Bay TMDL. The MEP submission was informed by MDOT SHA's priorities, water quality goals, and proposed BMP Portfolio. Some of the factors that were evaluated as part of the MEP submittal included information on project scheduling, budget process, and contracting limitations.

Because of the time needed to meet procurement requirements, planning and design, and permit processing, restoration projects may take several years to complete. For this reason, MDOT SHA's MEP submission included projects that are either currently in development or projected

for implementation during the proposed five-year permit term (i.e., 2025 to 2030). The Department does not believe that it is appropriate to delay the issuance of the Final Permit based on these developments in federal funding. Furthermore, the MEP Submission showed that

MDOT SHA's budget for projects comes from the State's Consolidated Transportation Program and there is not significant funding through grants.

In addition, the Department notes that the possibility of funding based on future, yet-to-be-completed appropriations and grant/loan applications is not the same thing as secured funding for a specified purpose. Although the likely timeframe for construction of future restoration projects (post-2030) is beyond the scope of the Final Permit, the Department may consider the potential of these funding sources when developing future MS4 permits.

4. Anti-Backsliding

Restoration requirements in the previous iteration of MDOT SHA's MS4 permit required the restoration of 20% of untreated impervious area in each jurisdiction. As noted above, the new MS4 permit for MDOT SHA exceeds the Phase III WIP target of 2% per year by requiring 15% ISR. This requirement for additional BMP implementation and pollutant load reductions beyond those achieved during the previous permit will result in greater pollutant load reductions and water quality improvements to the Chesapeake Bay. Accordingly, the Final Permit requires MDOT SHA to maintain or replace all restoration and practices required under its prior MS4 permit. Therefore, the Final Permit requirements ensure that restoration is cumulative and additive.

Anti-Backsliding and the Impervious Surface Restoration Requirement. Certain comments suggested that the ISR requirement must be maintained at 20% or increased and argued that anything less than a 20% rate of restoration in each MS4 permit is backsliding. The Department disagrees with the suggestion that effluent limits in the Final Permit are less stringent than the prior permit. The CWA provision contains an anti-backsliding requirement at 33 U.S.C. § 1342(o). This statute provides that "a permit may not be renewed, reissued, or modified … to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit." An effluent limitation is defined under 33 U.S.C § 1362(11) as any restriction on quantities, rates, and concentrations of pollutants in stormwater discharges.

The Final Permit complies with these provisions by ensuring that restoration is cumulative, additive, and continuous. Additionally, Maryland's Appellate Court's opinion on the appeal of Baltimore County and Baltimore City's Phase I permits upheld those permits (which were used as a framework for MDOT SHA's Draft Permit). Specifically, the Appellate Court determined that "the permits do not constitute unlawful backsliding" and agreed that "[t]he permits are cumulative and their new requirements add to the requirements from earlier permits, so they aren't 'less stringent than the comparable effluent limitations in the previous permit.'" (See *In the Matter of the Petition of Blue Water Balt., 260 Md. App. 246, 282 (2024)*).

The Final Permit requires that existing BMPs and restoration practices installed in prior permits be maintained and continue to be implemented. *See, e.g.*, PART IV.E.1., PART VII.E, PART VII.F. The Final Permit also requires that annual practices used to meet the prior MS4 permit's ISR requirement be continued at the same level of implementation or be replaced with permanent practices as noted in PART IV.E.1. These permit provisions ensure that the effluent limits required under the prior Phase I MS4 permits are maintained as part of the Final Permit by ensuring that restoration is cumulative, additive, and permanent.

The Final Permit not only conforms with the anti-backsliding provisions under the CWA, but additional pollutant reductions will be achieved with the implementation of new practices. In addition to maintaining effluent limits from prior MS4 permits, PART IV.E.3 of the Final Permit requires MDOT SHA to increase impervious surface restoration. Therefore, the Final Permit represents a net *increase* in pollutant reductions beyond the prior Phase I MS4 permits.

Anti-Backsliding and Water Quality Credits. One commenter suggested that the water quality credit trading provisions in the Final Permit will not produce pollutant reductions commensurate with what would have been achieved in their absence. The commenter concluded that these provisions represent backsliding from the restoration requirements under MDOT SHA's prior MS4 permit. However, the anti-backsliding provision in the CWA does not speak to the level of restoration accomplished by the various restoration options including trading; rather, the CWA requires that the level of pollutant reductions achieved in the prior permit must not decrease under the terms of the new permit. MDOT SHA did not acquire nutrient credits during the previous permit term and therefore has no trades to replace. PART IV.E.9 of the Final Permit stipulates that additional water quality credits may be acquired for meeting the new ISR requirement. Accordingly, any trades executed under the Final Permit will not impact pollutant reductions achieved in prior Phase I MS4 permits, and, therefore, these provisions conform with the anti-backsliding regulations under the CWA.

Trading in the Final Permit is further addressed in the Water Quality Credit Trading section in this document.

5. TMDLs

The Department received numerous comments on the Draft Permit regarding TMDLs, a requirement found in § 303(d) of the CWA. A TMDL establishes the maximum amount of an impairing substance that a waterbody can assimilate and still meet water quality standards. That amount, or a pollutant load, is then allocated among pollution contributors (e.g., factories, wastewater treatment plants, and nonpoint sources). The pollutant load that is allocated to point sources under a TMDL is the wasteload allocation (WLA). The pollutant load that is allocated to non-point sources under a TMDL is the Load Allocation (LA).

As explained above, the Chesapeake Bay TMDL allocates each Bay jurisdiction—including Maryland—a pollutant load that the Bay jurisdiction must reduce. The State of Maryland has assigned its pollutant load under the Bay TMDL to specified categories of point sources (e.g., wastewater treatment plants, MS4s) as detailed in a Watershed Implementation Plan (WIP). The Department issues NPDES discharge permits within these categories of dischargers to achieve pollution reduction targets outlined in the WIP.

The Final Permit requires MDOT SHA to (1) implement specific programs (e.g., illicit discharge detection and elimination, property management, restoration) that are designed to control pollution in stormwater discharges, and (2) implement restoration for the Department-approved TMDL plans for the watersheds listed in Appendix A of the Final Permit, including the Bay TMDL to control pollution in stormwater discharges further. These plans include the construction of upland BMPs and stream restoration projects, and ongoing street sweeping and inlet cleaning programs to reduce the amount of pollutants entering these watersheds.

In addition, the impervious acre restoration requirement is a surrogate metric used in both the Final Permit and the Phase III WIP to reflect stormwater WLAs and pollutant load reductions. The MD Supreme Court rulings in *Anacostia Riverkeeper*, 447 Md. 88 (2016) and *Carroll County*, 465 Md. 169 (2019) validated the Department's use of an impervious acre metric as a surrogate for Chesapeake Bay stormwater WLAs. By implementing these programs, MDOT SHA is working toward improving water quality and ecological health in their receiving waters. Several comments reflected concerns with how the Draft Permit incorporated Maryland's Phase III WIP, local TMDL implementation plans, growth, and watershed assessments. The following discussion addresses these additional comments regarding the Draft Permit and TMDLs. The Department does not address comments on the Phase III WIP itself because that plan was finalized on August 23, 2019 and included its own public participation process.

Comments Regarding the Chesapeake Bay WIP.

1. *MDOT SHA's MS4 Permit is consistent with the Phase III WIP*

   Comments expressed concern that the Draft Permit is not consistent with the stormwater WLAs enumerated in the Phase III WIP.

   The Department disagrees with these assertions. As noted above, the WIP states that MS4s "should be capable" of restoring two percent of their impervious area per year. However, the WIP also notes that the Department "will work with [p]ermittees on an MEP analysis to determine what is feasible." Permittees differ in size and physical capacity, so the level of

restoration required for each permittee is necessarily unique and proportionate to each jurisdiction's capacity within its MS4 permit term. After evaluating this information in

tandem with other submittals and comments from other interested parties, the Department determined the level of restoration that each jurisdiction must complete over the course of its five-year permit term to be consistent with Phase III WIP goals (See Table 1 noted above). Therefore, the Final Permit and the Department's overall strategy are consistent with Maryland's Phase III WIP. The Phase III WIP further states: "[a]s progress must continue past 2025 for certain sectors to meet the WLAs assigned in the Bay TMDL … it is anticipated that significant restoration requirements will be maintained in the sixth- and seventh-generation permits. This will be done through subsequent MEP analyses that will be conducted at the outset of each permit term to update the pace based on the latest information available."

2. *MS4 permits are reducing urban stormwater pollution*

A commenter asserted that the MS4 permits are not resulting in reductions to urban stormwater pollution and noted that growth in development has offset progress. The commenter referenced the Environmental Integrity Project's report that criticizes the targets found in Maryland's Phase III WIP as compared to 2009 baseline loads. The Department disagrees with these assertions. Evaluating the effectiveness of the MS4 permits requires a more robust analysis than can be completed solely from CAST data. Furthermore, using CAST to compare pollutant loads from different versions of the Chesapeake Bay Watershed Model is a flawed approach.

Recent studies have found that the MS4 programs are effective and that there have been observed decreases in pollutant concentrations and loads. These results have been documented in Pilot Analysis of Maryland Phase I MS4 Permit Water Quality Data (Jepsen, R. and Caraco, D. 2020) released by the Interstate Commission on the Potomac River Basin, which included recommendations on how to develop a testing program to evaluate program effectiveness.

While the Department believes that CAST is a powerful tool to track overall progress toward Maryland's Chesapeake Bay TN, TP, and TSS targets, problems arise when using it as the only tool to track progress in individual source sectors, particularly urban stormwater. As discussed in the Department's response to the Environmental Integrity Project (*See* Appendix B, *Stormwater Backup in the Chesapeake Region, Russ et. al,* 2020), load estimates from earlier versions of the Chesapeake Bay Watershed Model (e.g., 2009) are not comparable because of periodic updates to the Chesapeake Bay Watershed Model and improvements in data reporting.

CAST does not provide a comprehensive assessment of BMP implementation in the urban stormwater sector, particularly historic BMPs. Many of the restoration BMPs implemented under the prior Phase I MS4 permits are attributed to the natural sector, (e.g., stream restoration, trees). CAST also includes the effects of growth and the conversion of natural and agricultural lands to urban areas. Growth masks much of the progress achieved in the urban stormwater sector. Because of these issues with tracking sector-specific progress, Maryland has developed a Chesapeake Bay Restoration Progress Tracker, which provides a more accurate means of tracking progress towards Bay goals in specific sectors (*see* Maryland's Chesapeake Bay Annual Progress available online at https://storymaps.arcgis.com/stories/0b3d1416c08b486eaea5378605de6d83).

The State was required by EPA to achieve aggregate targets for all sectors rather than sector specific targets. Maryland's projected 2025 Phase III WIP loads by source sector targets were based on a projected 2025 land-use scenario, thereby incorporating the effects of growth and a larger urban footprint. The Department anticipates that the agricultural and wastewater sectors will provide the bulk of the reductions to get to 2025 goals. BMP implementation in the urban stormwater sector will be key to offset projected growth in loads from the wastewater sector beyond the 2025 Chesapeake Bay TMDL deadline.

Comments Regarding Local TMDL Implementation. One comment suggested that the methods in the Accounting Guidance to address impervious surface requirements (i.e., the ISR) and progress toward meeting the Bay TMDL show reductions in nutrients and sediments, but do not show progress toward other local TMDLs. Another comment indicated the permit relies on the ISR requirement to meet targets for the Bay and local TMDLs, but stated that "the permit does not have ... specific nutrient pollutant reductions" and "the permit does not actually require any stormwater BMPs."

The Department disagrees with this assessment. Pollution reductions are achieved by requiring implementation of all local TMDL plans. Under PART IV.F.2 of the Final Permit, the implementation plans must contain a list of stormwater BMPs and other activities to be implemented to reduce pollutants for each new TMDL; a description of MDOT SHA's analysis and methods; and final implementation dates and benchmarks to meet each TMDL's applicable stormwater WLA.

Approved TMDL implementation plans must be incorporated in an MDOT SHA-Wide TMDL Stormwater Implementation Report under PART IV.F of the Final Permit. This report must include an annual summary of all completed stormwater BMPs and other actions that provide reductions for each TMDL, and an analysis and table summary of the net pollutant reductions

achieved annually and cumulatively for each TMDL with stormwater WLAs. The report must also include an updated list of proposed actions to demonstrate adequate progress toward meeting the Department's approved benchmarks and final stormwater WLAs.

The Department included all approved local TMDLs, WLAs, and the percent pollution reduction required under each TMDL in Appendix A of the Final Permit. If pollutants identified in an existing TMDL are not specifically addressed by the impervious acre restoration requirement, the Department has added permit requirements. For example, PART IV.F.3.c of the Final Permit requires an updated list of proposed practices toward meeting benchmarks and final WLA implementation dates. Furthermore, PART IV.F.3.d requires specific reporting on efforts to meet the trash WLAs, the effectiveness of public education and outreach efforts, and any modifications necessary to improve source reduction and proper disposal.

Bacteria TMDLs are ubiquitous throughout most jurisdictions, so identifying specific sources of bacteria in a watershed is integral to any management plan. Accordingly, the Final Permit requires new bacteria trend monitoring programs to detect wildlife and domestic animal sources (PART IV.G.2.b.ii). Additionally, the Illicit Discharge Detection and Elimination (IDDE) permit conditions require outfall screening during dry weather (PART IV.D.3.b) to identify wastewater contributions that may contain human sourced bacteria.

The Final Permit also includes a new PCB monitoring requirement. This requires MDOT SHA to develop a source tracking monitoring plan for all watersheds with PCB TMDL WLAs identified in Appendix A of the Final Permit where PCB reductions are required to meet water quality standards (PART IV.G.3). MDOT SHA must submit results and provide annual updates on its efforts to locate PCB sources in the landscape and to reduce loads to affected waterbodies in accordance with approved TMDLs listed in Appendix A of the Final Permit.

6. Best Management Practices

The Department received numerous comments regarding the best management practices available to MS4 jurisdictions for achieving restoration requirements. The comments related to the Draft Permit and the impervious acre credits outlined in the Accounting Guidance. *See, e.g.*, Final Permit, PART IV.C.6 (incorporating the Accounting Guidance by reference). The following discussion addresses the major comments received on BMPs and the credits available to meet the impervious acre restoration requirements and the Chesapeake Bay and local TMDLs.

Green Stormwater Infrastructure. The Department received comments expressing concern that the Draft Permit did not go far enough to incentivize using green stormwater infrastructure (GSI) to reduce stormwater runoff in urban environments. Commenters suggested that the Final Permit should require minimum levels of GSI and incentivize upland practices while reducing

the use of instream practices. Other commenters argued that GSI is more expensive than other BMPs and therefore, with limited funding, there will be less pollutant reductions if permittees are required to implement GSI with the same funding source. Additionally, commenters argued that the definition is GSI is too narrow and another commenter added that GSI should specify innovative and alternative practices. The Final Permit defines GSI as "all the practices listed in the 2021 Accounting Guidance that meet the requirements in 'Table 19. Eligibility for Green Stormwater Infrastructure Credits', and 'Table 20. Green Stormwater Infrastructure Enhanced Features', as well as the practices that meet the requirements of Section V.3. Land Cover Conversion BMPs." One commenter requested that the Final Permit's definition match the 2021 Accounting Guidance, which states "Green Stormwater Infrastructure (GSI) credit is provided when a BMP provides water quality treatment and incorporates natural processes using vegetation and soils." As noted above, the Final Permit's definition of GSI includes GSI practices identified in the Accounting Guidance.

The Department agrees that, where reasonable to do so, implementing GSI practices provides important benefits for managing stormwater runoff. The Final Permit requires that MDOT SHA identify past GSI, identify opportunities for additional restoration using GSI, document GSI implemented during the permit term, and indicate GSI implementation for the next permit term. Additionally, the Department encourages the use of GSI through the enhanced credits noted in the Accounting Guidance. This allows MDOT SHA to increase the credit for impervious surface restored for areas treated by green stormwater infrastructure by 35%.

This increase correlates to the improved pollutant removal performance of runoff reduction or "RR" practices from conventional stormwater treatment or "ST" practices as shown in "*Recommendations of the Expert Panel to Define Removal Rates for New State Stormwater Performance Standards*" (Schueler, T. and Lane, C. 2012a). Specifically, the CBP adjustor curves show that runoff reduction practices, including GSI, have greater pollutant removal efficiencies, and therefore, the Accounting Guidance specifies a greater credit for these practices. Because this incentive was not available in previous MS4 permits, the Department expects that the GSI practices will become more widely incorporated into local restoration plans as part of implementation efforts under the Final Permit.

There are ample opportunities to incorporate GSI into the design of new development and redevelopment projects because there is physical space available for their implementation. However, restoration in urban environments presents numerous challenges as existing features (e.g., buildings, streets, underground utilities) limit available space and increase construction costs. Therefore, the Department does not consider it reasonable to require minimum thresholds on the use of green stormwater infrastructure in the Final Permit. The Department further notes that the approved pollution control efficiencies in the Accounting Guidance are all beneficial, and the relative degree of benefit is reflected in the amount of credit that each practice generates.

MDOT SHA may choose among these approved practices and implement them with appropriate verification and maintenance to achieve the Final Permit's ISR requirement. This approach is consistent with the CWA's MEP standard and ensures transparency and accountability.

Finally, according to EPA and recent State legislation (*see* Section 9-1601(y) of the Environment Article), green infrastructure includes stream restoration and shoreline stabilization. The CBP states that green infrastructure includes restoration of existing natural areas (e.g., stream restoration and shoreline stabilization) that helps mitigate flood risks, provide habitat, and addresses stormwater.[5]

Alternative BMPs as a Tool to Achieve Restoration Requirements.

1. Effectiveness of Alternative BMPs

The Department received comments on the Draft Permit arguing that alternative practices do not lead to water quality improvements. For example, one commenter contended that the Draft Permit cannot make adequate progress toward meeting stormwater WLAs if pollution control practices do not directly manage stormwater quantity.

The Department disagrees with the commenter's assertion that alternative practices are not effective unless they directly manage water quantity. The practices authorized in the Accounting Guidance are consistent with the recommendations from CBP expert panels for urban stormwater BMPs. The CBP expert panel recommendations are based on scientific review and research on the performance of these practices. The CBP's experts have approved pollutant load reductions and established the methods to calculate reductions for alternative practices, such as street sweeping, stream restoration, and shoreline management. These alternative practices are incorporated into the Chesapeake Bay Watershed Model with the pollutant load reductions assigned by the CBP expert panels.

Accordingly, the Department finds that excluding an approved restoration practice solely on the basis that it does not address water quantity would be arbitrary. Restoration is a location-specific endeavor, and the Department believes it is appropriate and consistent with the MEP standard to allow permittees who must manage the runoff from an entire jurisdiction, or in MDOT SHA's case a permit area that crosses multiple jurisdictions, to select from approved practices that are consistent with performance standards and design techniques documented in available science. This approach allows an accountable and transparent framework. Expert-approved restoration practices control pollution that would otherwise be discharged to

[5] Johnstone, Caitlynn, "Seeing Green in Infrastructure", U.S. EPA Chesapeake Bay Program January 2018 and found here: www.chesapeakebay.net/news/blog/seeing_green_in_infrastructure

local waterways, which is the fundamental purpose of the Final Permit. As such, the Department disagrees with the commenter's arguments because the Final Permit incorporates reasonable assumptions that are supported by expert scientific assessment of available practices to address pollution that are consistent with the Chesapeake Bay Watershed Model. One commenter made recommendations regarding specific alternative BMPs, including implementation of outfall retrofits, cleaning inlets, allowing only street vacuums instead of street sweepers, and crediting reduced salt use. Another commenter suggested increasing the credits for upland stormwater control practices to incentivize their use, particularly for land cover conversion practices, urban soil restoration, and runoff reduction practices.

The Department advises that an outfall retrofit is an approved BMP in the 2021 Accounting Guidance. Specifically, the 2019 *Recommendations for Crediting Outfall and Gully Stabilization Projects in the Chesapeake Bay Watershed* was approved by the Urban Stormwater Workgroup. In addition, "Advanced Street Sweeping" in the Accounting Guidance refers to vacuum assisted sweepers and regenerative air sweepers, which receive a significantly greater credit than the negligible credit provided by mechanical sweeping. Furthermore, reducing salt use is now a permit requirement and includes a mandatory Salt Management Plan, a plan for evaluating new equipment and methods for continual program improvement, training and outreach, and tracking and reporting. The 2021 Accounting Guidance also allows a new opportunity for implementing infiltration by using the urban soil restoration BMP, increased credits to incentivize forestation, new land cover conversion opportunities (e.g., street trees, urban tree planning), a forest conservation credit to incentivize the protection of existing resources, increased credit for using Green Stormwater Infrastructure, and Watershed Management practices to incentivize runoff reduction and upland BMP installation.

Salt management in the Final Permit is further addressed in the Salt section in this document.

2. *Alternative BMPs and Local Priorities*

The Department received comments claiming that the Draft Permit allows the use of alternative BMPs that do not manage runoff or contribute to the control of more intense rainfall or flooding. These comments requested that the Department establish limits on the amount of restoration credit that can be used to meet permit requirements by practices, such as stream restoration and street sweeping, that the commenters believe provide little reduction in stormwater runoff volume. For example, certain comments claimed that street sweeping does not achieve reductions in stormwater runoff volume and that permittees could fulfill their entire restoration requirement by these alternative practices. The comments also suggested creating a hierarchy of stormwater management practices that prioritizes water

quantity control and identifies GSI practices as the prime objective. The Department disagrees with these suggestions.

Alternative BMPs are often an effective and necessary tool to address stormwater infrastructure maintenance and mitigate local flooding as part of a comprehensive stormwater management plan. These practices offer important benefits related to ensuring adequate conveyance of stormwater runoff and controlling pollution. For example, inlet cleaning and street sweeping remove trash and debris that can block storm drain systems. Keeping storm drain systems free of debris improves the capture and conveyance of runoff and is an effective mitigation strategy to address local flooding. Stream restoration reconnects degraded channels to floodplains, providing floodplain storage and treatment, and increasing the ability of natural systems to convey stormwater runoff safely.

Furthermore, permittees should have the flexibility to implement BMPs that are practicable and are optimized to address local impairments and benefit local constituents. It is not appropriate to place prescriptive limits on specific BMPs when all BMPs in the Accounting Guidance contribute to improved water quality at an efficiency set by scientific experts. While the Accounting Guidance does not include limits on certain practices, the Department created incentives to increase implementation of those practices preferred by the commenter. As previously noted, the Department developed an additional credit to incentivize green stormwater infrastructure. In addition, the Accounting Guidance's Watershed Management credit provides an incentive to implement practices that provide greater storage volume and are more resilient to changing weather patterns. These incentives, which are described in more detail in the 2021 Accounting Guidance, were based on the Department's analysis of data provided by independent experts (e.g., the RR and ST curves for green infrastructure and traditional structural stormwater management practices that provide storage). When evaluating pollution reduction targets for the Chesapeake Bay and local TMDLs, the Department considers the full suite of practices that are available, including alternative practices (e.g., street sweeping, inlet cleaning, stream restoration). Alternative practices will result in pollutant reductions as defined by the CBP's expert panel recommendations and will also address local TMDL requirements**.**

Stream Restoration.

1. Stream Restoration Implementation

Multiple commenters expressed concern about the successful implementation of stream restoration and suggested stream restoration be discouraged or removed as an option. Concerns included insufficient ecological uplift and negative impacts to wildlife, the loss of existing trees and forest, the need to control stormwater at its source to prevent the

degradation of streams and project failure, detrimental impacts of construction, insufficient regulatory oversight, and insufficient monitoring of outcomes. Suggestions included ensuring that projects are not exempt from forest conservation laws, requiring upland practices, and conducting cost-benefit analyses of ecological impacts. Comments were also submitted related to specific projects, planning and public participation processes of projects, contractors, resident impacts associated with construction, and mitigation banking.

The Department recommends a comprehensive watershed planning effort with an adaptive management framework to determine the practices best suitable to implement, where they are placed, and how many are used. This effort relies on numerous federal, State, and local regulatory programs that provide substantial oversight into the design, permitting, construction, and post-construction process for all stream restoration projects. The Department's permitting process is governed by the nontidal wetlands regulations (COMAR 26.23) and waterway construction regulations (COMAR 26.17.04).

The Department's Wetlands and Waterways Protection Program (WWPP) reviews all stream restoration projects and requires documentation demonstrating that restoration is proposed due to functional impairment of biology and geomorphology of current stream conditions. The review process includes close coordination with the Army Corps of Engineers, EPA, the U.S. Fish and Wildlife Service, and Maryland's Department of Natural Resources (DNR). In addition, these projects are subject to local erosion and sediment control plan review and approval requirements that are enforced through construction inspections by the local jurisdiction as well as the Department.

Additionally, the Whole Watershed Act, passed during the 2024 Legislative Session, establishes minimum criteria for the monitoring associated with each stream restoration project. *See, e.g.*, Title 18 of the Environment Article, Annotated Code of Maryland. Upon project completion, at least five years of monitoring in accordance with the design and permit are required. This monitoring includes assessments of stream stability, floodplain function, and vegetation viability to ensure that restoration goals are met. The Whole Watershed Act will also require expanded public notification requirements and the frequency of public meetings for stream and floodplain restoration projects during the design process. This process allows for resident concerns associated with local projects to be addressed and considered prior to construction.

Additional oversight is provided through the Department's MS4 permits and Accounting Guidance. MDOT SHA is required to adhere to the technical specifications in the Accounting Guidance and CBP expert panel protocols to receive credit toward ISR requirements. The Accounting Guidance is consistent with the CBP reports (Burch, J et al.

2019, Wood, D. & Schueler, T. 2020) and associated qualifying criteria for BMP implementation. These include a requirement to maintain or expand riparian vegetation, compensate for any riparian losses, and consider unintended consequences.
The Department also reviews MDOT SHA's annual reports, which are required in the Final Permit (PART V.A). MDOT SHA is required to annually submit an MS4 Geodatabase that includes stream restoration protocol information and inspection data. These inspections are performed using the CBP's *Recommended Methods to Verify Stream Restoration Practices Built for Pollutant Crediting in the Chesapeake Bay Watershed* (Burch, J. et al. 2019) to verify the projects are functioning as designed. Stream restorations that fail an inspection as documented through MS4 Geodatabase annual reporting will not receive credit in accordance with CBP recommendations. When proper maintenance and any necessary remediation is restored, the credit may be reapplied.

The practice of stream restoration has evolved over time and especially within the past decade as implementation increased. As restoration techniques and their water quality effects continue to evolve, the Department continues to engage with the academic and research community to gain a better understanding of project benefits and shortcomings. Specifically, the Department continues to work with partner organizations, such as the Chesapeake Bay Trust's (CBT) Pooled Monitoring initiative, to guide research studies intended to help us understand the overall effects of stream restoration. The Chesapeake Bay Trust's pooled monitoring initiative provides critical research regarding specific watershed restoration techniques, variable elements of those techniques, and watershed restoration as a whole. These research efforts have included a review of past and recent stream restoration implementation and lessons learned. The Department continues to collaborate with CBT and CBP in mutual efforts to better understand best practices to improve implementation success.

2. *Stream Restoration Crediting*

Multiple commenters requested that credits be reduced or eliminated for stream restorations.

The Department does not allow restoration projects to be undertaken in a stream unless there is evidence of degradation. Stream restoration techniques may be proposed to achieve various goals, including stabilizing streambeds and banks to prevent erosion and sediment export, promoting floodplain reconnection, enhancing surface/groundwater interaction, promoting nutrient cycling and denitrification, enhancing sediment trapping in floodplains, as well as improving habitat conditions for in-stream aquatic life.

Projects that meet the Department's regulatory review process described above may be eligible for restoration credit. The Accounting Guidance outlines a process for determining credits consistent with the CBP expert panel recommendations. The CBP expert panel process includes a literature review of the latest science associated with stream restoration and the conclusions are based on the consensus of all members. Therefore, reducing or eliminating the stream restoration credit is not appropriate because it is based on science and independent experts in the field of stream restoration. The stream restoration protocols are not only used in Maryland, but in other Bay states participating in the CBP partnership, including Delaware, Pennsylvania, Virginia, and West Virginia. As noted above, permittees also need the flexibility to determine the most effective BMPs to implement to address local impairments, optimize benefits to local constituents, and improve water quality. Accordingly, the Department will not eliminate credits achieved through stream restoration, which are consistent with recommendations by the CBP expert panels.

7. Water Quality Credit Trading

The Department allows the use of water quality credits (nitrogen, phosphorus, and sediment) as an option to meet the Final Permit's new ISR requirement in PART IV.E.8. The State's Water Quality Trading Program (Trading Program) was established in 2018 by COMAR 26.08.11 after in-depth, public discussions by the Maryland Water Quality Trading Advisory Committee made up of stakeholders across multiple sectors including local and regional government, private industry, and environmental NGOs. Throughout this process, the State worked closely with EPA to ensure the Trading Program was consistent with the CWA and the Bay TMDL. The regulations created a program for credit generation and exchange to ensure pollution reductions are achieved, established procedures for credit verification, and a marketplace that is transparent to the public. Maryland's Trading Program provides a restoration option with the potential to "achieve results faster and at a lower cost, accelerating efforts to restore and improve water quality." COMAR 26.08.11.01A. Trading may be done by partners from the agricultural, stormwater, wastewater, and on-site sewage disposal sectors. The Accounting Guidance outlines additional criteria for applying credits toward impervious surface restoration and TMDLs. Trading is authorized in the Final Permit as one option toward meeting the ISR requirement if MDOT SHA chooses to use it.

The Department received comments on the Draft Permit expressing concern about how credit trading will be accomplished. Specifically, these comments focused on the following topics: the legality of applying credits to MS4 restoration; alleged double counting of pollution reductions in the Chesapeake Bay Watershed Model when applying credits from wastewater treatment plants (WWTPs); whether trading creates further pollution reductions (i.e., additionality); the

timeline to replace credits; environmental justice; co-benefits; and the portion of restoration that may be accomplished through trades and specifically from WWTP credits.

The majority of these topics were discussed extensively as the trading rules and regulations were developed, and public comments were accepted and addressed at that time. The regulations allow NPDES Phase I MS4 permittees to trade and created the principles that act as the framework for the State's Trading Program. The Department has responded below to all comments submitted for the Draft Permit's public comment periods. However, it is noted that much of the public comments about trading do not directly pertain to language in the Draft Permit for which the Department is accepting public comments. Instead, this information is provided as background for the public to fully understand the Department's decisions regarding additional rules for NPDES Phase I MS4 permittees to trade.

Accounting for Pollution Reduction in the Chesapeake Bay Watershed Model when Applying Credits from Wastewater Treatment Plants (WWTPs) to Stormwater Restoration. One commenter suggested that credits generated by WWTPs and applied to other sectors are double counted in the Chesapeake Bay Watershed Model, and therefore do not create additional pollution reduction.

Trades are not currently incorporated into the accounting system of the Chesapeake Bay Watershed Model for demonstrating Maryland's progress toward meeting the targets established in the Chesapeake Bay TMDL. After the WWTP achieves and complies with all applicable WLAs in its discharge permit to be consistent with the Chesapeake Bay TMDL and/or State TMDLs (*see* COMAR 26.08.11.05), its discharge permit can be modified to generate credits based on the additional pollution reduction achieved. The credits may be acquired by a NPDES MS4 permittee to count toward its ISR. However, when the Department reports to EPA for the Chesapeake Bay Watershed Model, the credits are not counted with other stormwater BMPs implemented for restoration. There is no mechanism at this time to incorporate water quality trading into that reporting. Therefore, there is no double counting: the WWTP's over-performance is counted but the credits are not.

The EPA has reviewed the trading framework to ensure its consistency with the CWA and the Chesapeake Bay TMDL. Further restrictions have been incorporated to ensure additionalities are created during trades. The *Maryland Trading and Offset Policy and Guidance Manual, Chesapeake Bay Watershed* (2017) specifies that the WWTP must evaluate the impact of any trade on projected sewer allocations and local growth plans (available at mde.maryland.gov/programs/water/Documents/WQTAC/TradingManualUpdate4.17.17.pdf). Furthermore, COMAR 26.08.11.06 specifies that WWTPs trading with MS4s are restricted to trading performance-based credits that are generated by actual pollution reductions determined

using concentration-based benchmarks and are not generated by an estimate of treatment capacity. As credits are generated, the WWTP permit is modified to memorialize the pollution reduction. Every trade must also set aside a portion of credits (i.e., a reserve ratio) that the Department may use in cases such as when the BMP that generated the credits is damaged or underperforming through circumstances beyond the owner's control (*see* COMAR 26.08.11.08).

One commenter made a similar claim that trading will cause backsliding because it is not as "straightforward" as directly restoring impervious surface area by installing stormwater BMPs or taking a numeric load reduction approach. They claimed that an "acre's worth of paper credits is not equal in value to an acre of restored impervious surface."

The Department disagrees with this assertion. The Trading Program requires that credits are generated on an annual basis so that reductions made in past years are not eligible. Only a WWTP's pollution reduction credits below the benchmark in the most recent calendar year are used to generate credits (*see* COMAR 26.08.11.06). Credits are generated by implementing pollution controls that demonstrate load reductions below established baselines. Instead of being a paper exercise, these procedures ensure the principle of "additionality", which was defined by a reference that the commenter submitted: "meaning that each credit must be backed by a real and additional reduction beyond what the credit generator is already obligated to produce".

Additionally, water quality credits acquired under the Final Permit may only be applied to new restoration under PART IV.E.8. This ensures that only the additional pollution reductions (i.e., credits acquired under the Final Permit) are applied to the permit's restoration requirement. Trading may not be used to replace BMPs constructed under a previous permit term. Therefore, consistent with the anti-backsliding provision of the CWA, pollution reductions accomplished in the prior permit do not decrease in the Final Permits and must be maintained.

Environmental Justice and Trading. One commenter expressed concern that water quality trading hinders environmental justice and furthers inequity through the outsourcing of pollution reduction benefits away from local communities.

The Department disagrees with this claim. The Final Permit provides flexibility to select projects that align with local priorities and policies. Implementation plans are required to be developed for TMDLs in impaired watersheds, which will drive MDOT SHA to implement restoration in those locations. The commenter noted that vulnerable and marginalized communities are disproportionately impacted by pollution. As MDOT SHA replaces credits (established above as records that represent real pollution reductions certified through the Trading Program) with their own on-the-ground stormwater BMPs, the Final Permit and the Accounting Guidance incentivize green infrastructure and watershed management and promote a restoration strategy that installs projects in watersheds with the greatest impairments.

The Department further notes that the aggregate benefits of trading include reducing costs and improving efficiency. This alleviates the burden for all stakeholders and ratepayers including local residents. Reducing the overall costs while improving water quality in the Chesapeake Bay will make resources available to implement future projects.

Co-Benefits and Trading. It was also suggested that acquiring water quality credits through trading does not provide co-benefits such as reduction of other pollutants, unlike directly implementing stormwater BMPs, and that credits are not equivalent to BMPs.

Credits represent pollution reductions that were confirmed by the State's Trading Program. As with stormwater BMPs, the projects implemented to generate credits may contribute to other TMDLs beyond nitrogen, phosphorus, and sediment, depending on the specific project installed. However, the commenter ignores this possibility because they view credit trading as a meaningless paper exercise and not as it actually is: a record of a real project or activity whose pollution reduction has been independently verified and certified through the Trading Program.

The Trading Program's marketplace encompasses a variety of sectors from which credits may be acquired, but the Permittee may apply credits only within limited watershed boundaries as described in the Trading Program rules (*see* COMAR 26.08.11.04). This ensures that the water quality benefits of pollution reduction practices are geographically restricted. Again, the State's Trading Program was approved by EPA and has incorporated the EPA's framework to ensure real pollution reductions. Although additional co-benefits are possible, the program only authorizes credits for the three pollutants limited by the Chesapeake Bay TMDL (nitrogen, phosphorus, and sediment). However, as noted above, the Department's Accounting Guidance incentivizes the installation of projects that provide co-benefits.

A related concern was expressed that allowing trading could cause MDOT SHA to make less effort to reduce other pollutants to the MEP. However, a guiding principle of the Trading Program is to reduce workloads by creating efficiencies. This helps to achieve results beyond what would have been accomplished within individual sectors. In addition, credits in the Trading Program represent tangible reductions in Bay TMDL pollutants and are limited by trading regions. The Trading Program restricts trades to 98 TMDL segments, but MDOT SHA is allowed to trade credits from any of the segments in the MS4 permit area. Additionally, local water quality is further protected by rules that prohibit trading that causes or contributes to local water quality impairments or prevents the attainment of local water quality standards. Furthermore, credits used within any impaired waters must be generated within those waters or upstream of the credit user's discharge (*see* COMAR 26.08.11.08). The Department further caps trading in PART IV.E.8 to ensure that MDOT SHA does not rely too heavily on credits to meet its ISR requirement. Collectively, this approach maximizes local water quality benefits at the lowest cost while providing transparency and accountability for all parties.

Limits to Trading Within the Permit. The Final Permit limits the number of water quality credits obtained from trades with WWTPs (*see* PART IV.E.8). One commenter supported the limiting of impervious surface restoration through water quality credit trading and argued that trading should be prohibited altogether because "the trading provisions ignore the substantial benefits to local communities that accompany real, on-the-ground pollution reduction practices and can exacerbate disproportionate impacts of pollution…." Conversely, during the Draft Permit's development, NGOs representing local governments requested that water quality credit trading should not be limited at all in the reissued MS4 permits.

The Final Permit balances the priorities of multiple stakeholders, including the State's commitment to cross-sector water quality credit trading as an option for accomplishing regulatory and environmental goals within limited watershed trading regions. The Trading Program restricts trading into regions and prohibits trades that contribute to local water quality impairments to ensure that water quality continues to improve to prevent any disproportionate impact from the temporary use of trading. The Department notes that trading is an option—not a requirement—and pollution reductions are mandatory regardless of whether MDOT SHA chooses to utilize trading. Similar to stormwater BMPs, credits must be maintained and reported annually and are assessed at the end of the permit term with the full restoration requirement. If a Permittee relies on a WWTP credit that becomes unavailable in a subsequent calendar year due to under-performance at the WWTP, then the Permittee must replace that credit with another credit or implement additional restoration to address the difference. The Department further notes that cross-sector trades are not intended to be permanent solutions to stormwater management and must be replaced over time with local stormwater BMPs. Trading allows for a flexible and cost-effective way for the permittees to ultimately comply with permit conditions.

The Department has received no information to substantiate the allegation that trading has any disproportionate negative impact, and the Department supports MDOT SHA's ability to utilize the marketplace to acquire credits and apply them within the parameters of the State's Trading Program to reduce pollution as quickly and efficiently as possible. Trading provides a limited option that encourages cross-sector collaboration and innovation while keeping the State's Phase III WIP goals on track. Public transparency and accountability are ensured through posting on the public marketplace and reporting alongside other restoration efforts in annual reports.

8. Stormwater Monitoring

The Department received comments regarding the Assessment of Controls (Part IV.G) section of the Draft Permit. Commenters expressed concern that monitoring requirements were insufficient,

and that the State's monitoring data should be incorporated into the Department's adaptive management approach. Commenters requested that monitoring be expanded to identify flood risks. Additionally, commenters requested additional monitoring for per- and polyfluoroalkyl substances (PFAS), PCBs, temperature, and biological impacts from polluted runoff.

Monitoring Requirements in the Permit. The Final Permit establishes statewide monitoring requirements that align with CWA goals to "restore and maintain the chemical, physical, and biological integrity of the nation's waters…." The objective of the BMP Effectiveness monitoring in the permit is to evaluate the cumulative effects of stormwater retrofits and alternative urban BMPs on a sub watershed scale. In addition, the objective of the Watershed Assessment monitoring requirement is to evaluate the condition of local TMDLs, and stream health and integrity by assessing the biology of aquatic systems and their relationships with habitat and water quality. Results of both monitoring requirements will be used to evaluate BMP implementation efforts while also understanding overall stream health and biological response to restoration in these watersheds.

MDOT SHA has two options to meet the intent of the BMP Effectiveness and Watershed Assessment requirements outlined in the permit. MDOT SHA may perform focused monitoring as outlined in the permit to assess the performance of individual restoration practices and evaluate local water quality conditions for local adaptive management, and to calibrate models. This focused monitoring strategy is supported by the NRC's *Achieving Nutrient and Sediment Reduction Goals in the Chesapeake Bay: An Evaluation of Program Strategies and Implementation* (NRC, 2011). Specifically, NRC recommends that "[t]argeted monitoring programs in representative urban and agricultural watersheds and subwatersheds would provide valuable data to refine BMP efficiency estimates, particularly at the watershed scale, and thereby improve Watershed Model predictions." The Final Permit requires that BMP Effectiveness monitoring include continuous measurements for temperature at the monitoring location selected by MDOT SHA. Biological monitoring is included in the requirements for both BMP Effectiveness and Watershed Assessment. Alternatively, MDOT SHA may contribute to a pooled funding program that performs targeted research on local water quality and restoration efforts implemented statewide that can assess stream health and inform adaptive management strategies to meet the goals of the CWA.

Offering MDOT SHA the option of the pooled approach for meeting permit monitoring requirements provides the optimal management outcome for the State. This is consistent with the intent of the EPA *Interpretive Policy Memorandum for Reapplication Requirements on Municipal Separate Sewer Systems*. 61 Fed. Reg. 41698-01 (August 9, 1996). In this memo, EPA recommends that permitting authorities (e.g., the Department) work with permittees to determine

if stormwater monitoring efforts are "appropriate and useful." EPA further recommends that changes be proposed to make these monitoring programs more useful. The Department's targeted monitoring approach and decision-making, which is in accordance with the EPA memo, was affirmed in *Maryland Department of the Environment v. Anacostia Riverkeeper, et al.*, 447 Md. 88 (2016). The Court affirmed that monitoring requirements in NPDES permits are "sufficient to yield data which are representative of the monitored activity." *Id*. at 149.

The 1996 Policy memo (see above) also notes that habitat assessments, bioassessments, or other methods other than end-of-pipe chemical monitoring can be acceptable monitoring approaches to meet CWA goals. Thus, the pooled monitoring program provides an alternative option to meet NPDES monitoring requirements to yield data representative of stream health and various management strategies implemented in the State. This approach is consistent with the MD Supreme Court decision noted above, whereby representative data becomes informational and useful when examined in aggregate along with a continuum of monitoring efforts within the State.

The pooled monitoring approach, administered by the CBT, is appropriate and useful because it provides a vehicle to combine financial resources from a group of funding partners with similar research interests. Scientists and other stormwater professionals whose projects are funded by the program can combine resources and tools to evaluate BMP performance and water quality outcomes on a scope that may not be feasible for an individual jurisdiction. Information on past research projects provides data representative of a variety of BMPs along with broader recommendations to assist permittees in program implementation (See: cbtrust.org/grants/restoration-research/).

The pooled approach offers flexibility to permittees so they can choose the most cost-effective option for meeting permit requirements. As an example, MS4 permittees already have local monitoring programs to evaluate BMP effectiveness. They may choose to continue these programs or use the money dedicated to these efforts to contribute to the pool to provide additional information that local monitoring may not address. Furthermore, the Watershed Assessment monitoring in the permit is a new requirement. The pooled option offers flexibility for permittees to determine whether it would be more advantageous to develop this program from scratch. Alternatively, participating in the pooled option provides an existing research framework that can be structured to provide county-specific watershed information, in accordance with the MS4 Monitoring Guidance and criteria on local stream health and TMDL impairments

Research deliverables funded under the program have enhanced the stormwater community's knowledge on a variety of BMPs such as stream restoration, urban tree planting, shoreline

erosion, environmental site design practices, and water quality conditions. The data can be used to link observed or measured outcomes such as biological integrity, resource trade-offs, or pollutant load reductions with improved practice design and other tools to inform local restoration programs. As a result, the research funded through this program can assist the State and local governments in refining restoration strategies, modifying design approaches, and understanding site specific factors that improve stream health. This is a valuable and necessary tool for cost effective planning and projections for meeting water quality goals. This not only expands the results of jurisdiction-specific monitoring efforts but also helps enhance overall adaptive management strategies to restore the waters of the State and meet the goals of the CWA.

The Final Permit requires MDOT SHA to develop a source tracking monitoring plan for all watersheds with PCB TMDL WLAs identified in Appendix A of the Final Permit where PCB reductions are required to meet water quality standards (PART IV.G.3). MDOT SHA must submit results and provide annual updates on its efforts to locate PCB sources in the landscape and to reduce loads to affected waterbodies in accordance with approved TMDLs listed in Appendix A of the Final Permit.

Temperature Monitoring Outside of the MS4 Permit. In addition to the temperature monitoring required in the Final Permit, monitoring for temperature also occurs through other State departments. The Maryland Department of Natural Resources (DNR) monitors temperature at all Maryland Biological Stream Survey (MBSS) monitoring locations statewide, providing a random sample of temperature conditions across the entire State. Also, DNR Fisheries monitors temperature in many Class III and IV streams with trout resources throughout the State. Additionally, the Department monitors temperature in watersheds as needed where TMDL development is required. These monitoring activities in addition to the monitoring requirements in the Final Permit provide valuable data for assessing Maryland's waters.

Monitoring for PFAS. Commenters requested that the permit include greater monitoring for PFAS. One commenter argued that no PFAS monitoring requirement in the Draft Permit "prevents the State from getting a better handle on the breadth and prevalence of PFAS pollution during the permit term." Another commenter stated the Department should develop plans to monitor and address forever chemicals like PCBs and PFAS.

The Department is committed to safeguarding the health and environment of Maryland's residents against the detrimental effects of PFAS chemicals. The Department is prioritizing the implementation of a science-based comprehensive plan for PFAS risk that is focused on determining whether there are locations in Maryland where there are unacceptable risks to human health associated with exposures to PFAS and whether there are locations of continuing releases of PFAS compounds. The Department's Fish Consumption Advisory Program

conducted a statewide PFAS fish tissue survey from 2020-2022 and has established over 76 new fish consumption advisories for PFOS for the general population, women, and children. Furthermore, the Department's Fish Consumption Advisory Program conducts routine monitoring by sampling for PFAS in fish tissue throughout the State on a five-year cycle.

Additionally, the Department monitors for PFAS in drinking water. In 2023, the Department began requiring Community Water Systems (CWSs) to report PFAS monitoring results in their annual Consumer Confidence Reports. In April 2024, the EPA established enforceable maximum contaminant levels (MCLs) for PFAS compounds in drinking water. Starting in April 2027, per EPA regulations, public water systems must complete initial PFAS monitoring requirements, begin routine monitoring of PFAS, and report these results to their consumers.

Since 2020, the Department has conducted PFAS sampling at over 100 municipal wastewater treatment plants (WWTPs) throughout the State, including all facilities that generate biosolids for land application and release treated wastewater through spray irrigation. Also, the Department is implementing biosolids guidance using the time frames established in the May 2024 House Bill 1153. This Bill requires the Department to identify significant industrial users of PFAS chemicals, develop PFAS monitoring and testing protocols for significant industrial users, develop PFAS action levels for addressing PFAS contamination from industrial discharge for pretreatment plants, develop mitigation plans for addressing PFAS, and implement measures to reduce PFAS discharge levels to WWTPs. In August 2024, the Department released interim guidance for land application of biosolids which requires sampling for PFAS at applicable WWTPs and establishes a tiered approach for application at specific thresholds for PFOS and PFOA. More information may be found at the Department's website: https://mde.maryland.gov/PublicHealth/Pages/PFAS-Landing-Page.aspx

The Department has incorporated PFAS monitoring requirements in several NPDES permits for municipal WWTPs. In the future, the Department will consider approaches to address PFAS impairments and require PFAS source tracking in MS4 permits. In September 2024, the EPA published final aquatic life criteria and benchmarks for select PFAS in freshwater. In the Department's Triennial Review of Water Quality Standards for 2025, the Department is considering the adoption of EPA's aquatic life criteria into State regulations. Additionally, in December 2024, the EPA released draft human health water quality criteria for PFOS, PFOA, and PFBS. Once final, the criteria may be used to establish water quality standards.

Adaptive Management Approach and Sharing of Monitoring Data. The Department has recently made monitoring data publicly available via StormwaterPrint on its website. Additionally, the Department maintains a repository database, called the Ambient Water Quality Monitoring System (AWQMS), which is a web-based data management system for ambient water quality data. This system has been designed for compatibility with EPA's Water Quality

Exchange Network (WQX), which is used as the method to share water quality data between the EPA and its partners throughout the United States. More information can be found on the AWQMS and EPA's WQX at the following links:
mde.maryland.gov/programs/water/TMDL/MD-AWQMS/Pages/awqms.aspx
www.epa.gov/waterdata/water-quality-data

PART V.A of the MS4 permit requires the permittee to submit annual reports on or before December 31st of each year. MDOT SHA is also required to post these reports on its website. The Department will post links to all the individual permittees' websites via a single portal to facilitate this process.

9. Salt

The Final Permit contains expanded requirements to reduce the use of winter weather deicing and anti-icing materials while prioritizing public safety. Current scientific understanding recognizes that reducing salt application on roads in the long-term is the only practicable method to reduce excess levels of chloride from this source and improve local water quality. Thus, the Final Permit requires MDOT SHA to implement best practices to improve the efficient application of road salt within the framework of a holistic Salt Management Plan. Key components of the plan include: training staff and contractors; educating the public; evaluating new technologies, application methods, and alternative materials for treating ice and snow; and tracking and reporting snowfall and the application amounts of deicing or anti-icing materials.

The Department received comments related to permit requirements to reduce the use of deicing and anti-icing materials. One commenter observed that local salt application often exceeds the amount necessary to treat ice and snow, leading to excess material washing into waterways. Another commenter called attention to fish kills in their local stream along with measured toxic chloride levels. The commenter asserted that requiring MDOT SHA to continue implementing its Statewide Salt Management Plan without updates is insufficient to address chloride pollution. Another commenter recommended that MDOT SHA explore alternatives for chloride use, including solar powered heating strips.

MDOT SHA is a leader in the State and developed a Statewide Salt Management Plan with the aim of reducing chloride through piloting the latest technology, methods, and knowledge. MDOT SHA's approach to winter weather management, outlined in that public document, serves as a model for other local jurisdictions and is cited as a reference in the most recent Phase I NPDES MS4 permits to guide the continued development of their own programs. The plan is updated annually to reflect new science and understanding. MDOT SHA has furthermore begun the work of addressing one of the root causes of excess salt application noted by commenters, through adjusting the level of service expectation for Maryland residents.

10. Thermal

The Final Permit requires MDOT SHA to implement thermal pollution management strategies in coldwater and thermally impaired watersheds, evaluate best practices that increase solar reflectance of impervious surfaces in coldwater and thermally impaired waters (consistent with Section 5.6.4 in the *2000 Maryland Stormwater Design Manual*), and ensure that any restoration in coldwater or thermally impaired watersheds utilize practices to cool and shade stormwater runoff. The Department received comments from local governments expressing concern that solar reflectance of roadways and highways will impair motorists' vision and increase temperatures for pedestrians. Additionally, some commenters argued there is no law defining how to implement thermal pollution management strategies, definitions for "thermal pollution management strategies" and "coldwater" were not in the Draft Permit, and more flexibility is needed for MS4s to select other strategies based on local monitoring and priorities.

Maryland designates and protects cold water streams under the CWA, identifying them as Use Class III (nontidal coldwater use), or Use Class IV (trout-stocking waters). Identifying and implementing practices to mitigate high stream temperatures is critical to the survival and health of coldwater fisheries and for meeting water quality standards. Therefore, the inclusion of thermal requirements in the permit is warranted.

Thermal pollution management strategies are identified in Chapter 5, Sections 5.6.4 and 5.6.5 of the 2000 Maryland Stormwater Design Manual and in Part IV.E.6 of the Draft Permit. The 2000 Maryland Stormwater Design Manual is incorporated by reference into COMAR 26.17.02.01-1 and the permit. Therefore, the management strategies noted in the Design Manual provide appropriate guidance for permit compliance. The Final Permit's requirement to evaluate available methods for solar reflectance provides the flexibility to identify best practices based on local priorities and public safety.

The Department recognizes that local MS4s are concerned that similar requirements may be established in future MS4 permits. However, requirements for future MS4 permits have not been established at this time. The Department is willing to discuss thermal requirements as future permits are developed.

11. Enforcement

The Department received comments regarding enforcement of the Draft Permit. These comments included several general concerns, such as defining adequate progress and benchmarks. There were also several comments about the technical details of resolving the Illicit Discharge Detection and Elimination (IDDE) investigations and performance goals and deadlines (see PART IV.F.3).

Comments on Adequate Progress, Benchmarks, and ISR. One comment argued that MDOT SHA should be held accountable for missing any benchmark—*see, e.g.*, Table 1 in PART IV.E.7 and 10)—and recommended that failure to meet a benchmark should trigger corrective action with specific consequences for failure.

The Final Permit defines a benchmark as "a quantifiable goal or target to be used to assess progress toward the impervious acre restoration requirement or WLAs, such as a numeric goal for stormwater control measure implementation." PART IV.E.7. In this context, benchmarks are an adaptive management aid and should not be considered as enforceable requirements. The Final Permit's benchmark provisions use language recommended by EPA in comments on a June 2020 draft permit for Phase I large permittees (i.e., Anne Arundel County, Baltimore City, Baltimore County, and Montgomery County) that mirrors language from the recently reissued MS4 permit for Washington, D.C. (see Appendix A, pp. 43 - 44, U.S. EPA, NPDES Permit No. DC0000221).

The Department uses benchmarks in the Final Permit as a tool to track progress, to provide guidance to adjust interim goals when necessary (i.e., adaptive management), and to ensure compliance with the Final Permit's requirements. This process takes place through annual report reviews that provide continuous oversight of program progress and targets.

The Department's use of the term "benchmark" in the Final Permit is also in accordance with EPA recommendations. The EPA comments on the June 2020 draft permit recommended specific language to allow for benchmarks "to be changed during the permit term as part of the MS4 iterative process." The EPA's 2017 NPDES Compliance Inspection Manual provides additional guidance to permitting authorities regarding the use of benchmarks as a compliance tool. Specifically, the 2017 Manual states that "not meeting the benchmark is not generally a permit violation … [but] would typically require the permittee to take additional action, such as evaluating the effectiveness of the stormwater control measures, implementing and/or modifying stormwater control measures, or providing additional measures to protect water quality."

The commenter also asserts that PART V.A.3 will not effectively result in program improvements to achieve permit compliance and progress toward meeting stormwater WLAs. The commenter also asserts that the Final Permit relies on self-regulation. The commenter suggests revised language that requires modifications to the program if MDOT SHA does not demonstrate compliance and show progress toward meeting WLAs.

The Department disagrees that the permit provision allows for "self-regulation" and with the suggested revisions. PART V.A (Annual Reporting) establishes the reporting requirements, which include MDOT SHA's efforts to implement program improvements reflecting an iterative approach (PART V.A.3). The review of information submitted to meet reporting requirements is

the mechanism by which the Department evaluates progress toward meeting permit requirements and assesses compliance with the Final Permit. The Department's role in this process is noted in PART V.B (Program Review). This provision states that the permittee will cooperate with the Department during review of annual reports, field inspections, and periodic inspections, and periodic requests for additional data to determine permit compliance. This provision further states that the Department will assess the effectiveness of the Permittee's program for reducing the discharge of pollutants to the MEP and working toward meeting water quality standards. Therefore, the Final Permit clarifies the Department's role will involve requests for additional measures or any appropriate action necessary to achieve permit compliance.

Other provisions that enforce compliance with the Final Permit are included in PART VII.E (Duty to Comply). This provision notes the requirement for the permittee to demonstrate adequate progress toward meeting WLAs and states that the Permittee "shall be responsible for complying with all conditions of this permit" and "Failure to comply with a permit provision constitutes a violation of the CWA and State law and is grounds for enforcement action; permit termination, revocation, or modification; or denial of a permit renewal application." Furthermore, PART VII.G of the Final Permit establishes civil and criminal penalties.

The Department has determined it is not necessary to modify the Final Permit as suggested by the commenter. As noted above, the Department retains the authority to impose any necessary action to ensure MDOT SHA achieves compliance with the Final Permit. As an example, within the past permit term, the Department has instructed MDOT SHA within annual report reviews to make programmatic corrections to maintain compliance with the permit, and MDOT SHA did so accordingly. As such, the Permit does not rely on self-regulation as alleged by the commenter.

Enforceability of Future Comments and Changing Permit Requirements. The Department wishes to provide further information on language contained within PART IV.F.1 requiring MDOT SHA to address all comments required by the Department for approval of any outstanding TMDL implementation plan within one year of the permit's effective date, as comments about this subject were submitted during the public comment period for the recently renewed Phase I Large and Medium MS4 permits.

TMDL implementation plans need to be iterative and adaptive. This permit condition allows the Department to ensure that the normal process of review and comment is continued for these TMDL plans. The condition also establishes a time frame to resolve any outstanding issues that delay approval of these plans.

Comments on Enforcement and the IDDE Program. One commenter argues that the language concerning IDDE enforcement (see PART IV.D.3) lacks the precision to ensure proper compliance with the CWA. The commenter stated that requiring MDOT SHA to implement a

program with little guidelines, maintain procedures for outfall screenings, investigate complaints, and handle enforcement actions is self-regulation that violates the CWA and will not guarantee illicit discharges will be identified and eliminated.

The Final Permit requires MDOT SHA to ensure that all discharges into, through, or from its MS4s—that are not composed entirely of stormwater—are issued a permit or eliminated (see PART IV.D.3). To enforce these requirements, PART IV.D.3.f of the Final Permit requires MDOT SHA to use "appropriate procedures for investigating and eliminating illicit discharges, illegal dumping, and spills." The Final Permit uses the term "suspected illicit discharge" deliberately in PART IV.D.3.f.; not all discharges to MS4s will ultimately be determined to be illicit (e.g., groundwater discharges). As such, the Department believes that the language "resolve the investigation" is appropriate because it encompasses both scenarios: a discharge that turns out to be lawful (e.g., an uncontaminated groundwater discharge), and a discharge that turns out to be unlawful (e.g., a sewer pipe that is connected to an MS4).

When MDOT SHA determines a discharge either originating from or discharging to another MS4 to be illicit, then it must be permitted (e.g., authorized by an industrial general stormwater permit) or eliminated to "resolve the investigation." As noted above, PART IV.D.3.f requires MDOT SHA to use "appropriate procedures for investigating and eliminating illicit discharges" *and* to coordinate appropriately with the adjacent MS4. If the neighboring jurisdiction fails to cooperate with MDOT SHA's investigation, undertake its own investigation, or to take appropriate action against a confirmed illicit discharge, then the discharge should be reported to the Department for enforcement. The Department oversees MDOT SHA's IDDE program through annual report reviews. MDOT SHA must annually document the illicit discharge investigations and submit detailed findings to the Department for review. Through this process, the Department determines whether MDOT SHA's actions to investigate and eliminate illicit discharges are consistent with State and federal regulations.

If MDOT SHA needs assistance in determining the appropriate program, MDOT SHA should contact its MS4 permit administrator in the Department's Stormwater, Dam Safety, and Flood Management Program. More specific reporting requirements for discharges that threaten human health or the environment are found under the Emergency Reporting Requirements section of the permit (PART VII.D).

Appendix A. Technical Comments on the Accounting Guidance, Permit, and Fact Sheet

Topic: Upland BMPs and Green Stormwater Infrastructure

- **Comment:** One environmental NGO commented that green stormwater infrastructure may deliver greater load reductions depending on where it is located within a watershed. This commenter further stated that the Accounting Guidance does not recognize or encourage optimization of BMP location; BMPs have the same efficiency regardless of location.
- **Response:** As discussed previously, pollutant removal efficiencies for the different BMPs are based on the CBP protocols; for upland BMPs, the CBP uses the pollutant removal adjustor curves found in Schueler, T. and Lane, C. 2012a & 2012b. The CBP protocols for upland BMPs and, therefore, the Department's crediting of those BMPs are based only on rainfall captured.

- **Comment:** One commenter stated MDOT SHA should research and develop durable pervious pavement, and investigate grant programs to convert sections of parking lots to bioretention or permeable pavement**.** This commenter added that MDOT SHA should be required to implement green street techniques for TMDL credits and all new road construction.
- **Response:** COMAR requires that MDOT SHA implement ESD to the MEP on all new development projects. If ESD to the MEP is exceeded, MDOT SHA is allowed to explore other options under State law. Due to safety and maintenance constraints, permeable pavement and bioretention may not feasible or appropriate in a given situation. Additionally, the Accounting Guidance incentivizes GSI for impervious surface restoration, and the permit promotes planning for additional restoration using GSI.

BMP Cost

- **Comment:** One environmental NGO commented that fiscal accounting for BMPs does not sufficiently analyze the costs of any proposed stormwater management project, and a more accurate method is needed to understand the true costs and benefits of particular BMPs.
- **Response:** The accounting methods for BMP costs are outside the scope of this permit.

Topic: ESC

- **Comment:** One environmental NGO commented that the permit does not sufficiently

address sediment from MDOT SHA projects. Another commenter stated that ESC should be inspected before and after each rain event.

- **Response:** The Draft Permit requires compliance with the State's ESC program. To fulfill this requirement, MDOT SHA's Quality Assurance Division regularly conducts ESC inspections at active construction sites. Additionally, if a project disturbs one or more acre of land, MDOT SHA is required to comply with the General Permit 20-CP for Discharges from Stormwater Associated with Construction Activity.[6]

Topic: Public Notification of TMDL Plans

- **Comment:** One commenter stated the EPA requires that all stakeholders should be included when developing stormwater management plans.
- **Response:** The Final Permit requires that MDOT SHA provide continual outreach to the public and other stakeholders for TMDL stormwater implementation plans, including a minimum 30-day comment period before finalizing plans. The approved TMDL plans incorporated into the Final Permit have already satisfied public notification requirements. MDOT SHA is not required to provide additional public notice when making minor programmatic changes to the implementation of individual BMPs to meet these plans.

Topic: Trees

- **Comment:** One environmental NGO argued that trees should be included in calculations for onsite stormwater management for specific projects.
- **Response:** As discussed above, the Final Permit encourages MDOT SHA to implement reforestation. Additionally, Maryland's stormwater regulations require ESD to the MEP for development projects.

Topic: General Comments

- **Comment:** Two commenters requested additional information on the BMPs found in Appendix B of the Draft Permit.
- **Response:** The Public Notice posted on the Department's website includes web links to MDOT SHA's MEP Submission and the BMP Portfolio.

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[6] Maryland Department of the Environment. 2023. General Permit for Stormwater Discharge Associated with Construction Activity, General NPDES Permit Number MDRC0000, State Discharge Permit Number 20CP0000A. Available at https://mde.maryland.gov/programs/water/wwp/Documents/20CP-Final/20CP-Permit-ModA-Final.pdf.

Appendix B. Summary of Permit Language Clarifications and Edits

The Department provided edits and clarifications to permit conditions. The requirements in the permit remain substantively unchanged. The language changes provide greater clarity of the intent of specific requirements and how to comply with these provisions. A summary of these changes are listed below.

Permit Section	Change	Summary
Part IV.E.3.	ISR increased from 3,046 acres to 4,092 acres.	MDE determined that the MEP was 3,046 acres and used that amount for the Tentative Determination. MDOT SHA indicated increased capacity and a desire to lead by example based on the most recent State budgetary projections, and the ISR commitment was increased to 4,092 acres. This is not a decrease in the Department's MEP determination and MDOT SHA has committed to this number. Therefore, this change is not substantive.
Part IV.E.5.	Changed "the Department's EJ screening tool" to "the Department's screening tool", and changed "underserved and overburdened communities" to "communities with environmental justice concerns"	The changes clarify that these are reporting requirements using the EJ tool. MDOT SHA's substantive obligation to identify existing and potential GSI projects in EJ areas remains unchanged.
Appendix A	Added clarifying information with Type (e.g., Aggregate, Individual), Geography (e.g., county specific WLA, watershed-wide WLA), and MS4 WLA Notes.	The changes clarify which TMDL WLAs apply to MDOT SHA and do not change the specific TMDL WLAs included in the Appendix.

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Appendix D. Acronyms and Substitutions

APA - Administrative Procedures Act
AWQMS - Ambient Water Quality Monitoring System
BMP - best management practice
BMP Portfolio - Restoration Project Portfolio
CAST - Chesapeake Assessment and Scenario Tool
CBP - Chesapeake Bay Program
CEJSC - Commission on Environmental Justice and Sustainable Communities
CFR - Code of Federal Regulations
COMAR - Code of Maryland Regulations
CWA - Clean Water Act
Department - Maryland Department of the Environment
Design Manual - 2000 Maryland Stormwater Design Manual, Vol. I & II
EFC - Environmental Finance Center
EJ - environmental justice
ESC - erosion and sediment control
ESD - environmental site design
FCA - Financial Capacity Analysis
FR - Federal Register
FY - fiscal year
GSI - green stormwater infrastructure
IDDE - illicit discharge detection and elimination
MEP - maximum extent practicable
MHI - median household income
MS4 - municipal separate storm sewer system
NGO – non-governmental organization
NPDES - National Pollutant Discharge Elimination System
NRC - National Research Council
PCA - Physical Capacity Analysis
PCB - polychlorinated biphenyls
RPC – Responsible Personnel Certification
SWM - stormwater management
TMDL - total maximum daily load
TN - total nitrogen
TP - total phosphorus
TSS - total suspended solids
U.S. EPA or EPA - United States Environmental Protection Agency
USWG - Urban Stormwater Workgroup
WIP - Watershed Implementation Plan

WLA - wasteload allocation
WM - Watershed Management
WQBEL - water quality based effluent limit
WQGIT - Water Quality Goal Implementation Team

Appendix E. List of Comments Received During Public Notice

Commenter	Description
Ms. Elle Bassett (Arundel Rivers Federation)	Verbal Testimony (see transcript)
Mr. Kenneth Bawer (Coalition to Stop Stream Destruction)	Verbal Testimony (see transcript) Email (1 page) Letter (56 pages) Appendices (36 pages)
Chesapeake Bay Foundation	Email (1 page) Letter (6 pages)
Ms. Sharon Boies (Protect Our Streams)	Verbal Testimony (see transcript) 2 Emails (2 pages) Written Testimony (4 pages) Letter (14 pages)
Contech	Letter (2 pages)
Ms. Megan Crigger	Email (2 pages)
Mr. Roger Davis	Email (1 page) Verbal Testimony (see transcript)
Mr. Wayne Davis	Email (1 page) Letter (3 pages) Attachment (109 Pages)
Mr. Robert Dover	Verbal Testimony (see transcript) Email (1 page) Letter (2 pages) Document (41 pages) Attachments (19 pages)
Mr. Brian England	Verbal Testimony (see transcript) 2 Emails (2 pages) Written Testimony (3 pages)
Ms. Kennedi Fichtel (Chesapeake Legal Alliance)	Verbal Testimony
Friends of Sligo Creek	Letter (3 pages) Attachments (11 pages) Testing results
Ms. Sarah Kellett	Email (1 page)
Delegates Jen Terrasa, Sheila Ruth, and Mary Lehman	Letter (1 page) Attachment (6 pages)
Maryland Municipal Stormwater Association (MAMSA)	Document (8 pages)

Commenter	Description
Maryland Sierra Club	Email (1 page) Letter (2 pages)
Public Employees for Environmental Responsibility (PEER)	Email (1 page) Letter (1 page)
Mr. Michael Wiercinski	Email (1 page)
Mr. Ernesto Villasenor (Waterkeepers Chesapeake)	Verbal Testimony (see transcript)

Additional Comments Received

Chesapeake Legal Alliance (CLA), Signed by: ● Arundel Rivers Federation ● Beaverdam Creek Watershed Watch Group ● Blue Water Baltimore ● Chapman Forest Foundation ● Chesapeake Bay Foundation ● Citizens Against Beltway Expansion ● Coalition for Transit Alternatives to Midcounty Highway Extended ● Conservation Montgomery ● Corsica River Conservancy ● Ecorizons Conservation Consulting ● Eyes of Paint Branch ● Friends of Lower Beaverdam Creek ● Friends of Sligo Creek ● Maryland Conservation Council	Letter (36 pages) Appendices (292 pages) ● Maryland League of Conservation Voters ● Mattawoman Watershed Society ● Mid-Atlantic Youth Anglers & Outdoors Partners ● Montgomery Countryside Alliance ● Montgomery County Civic Federation ● Nature Forward ● Potomac Conservancy ● Rock Creek Conservancy ● Seneca Creek Watershed Partners ● Sustainable Hyattsville ● Waterkeepers Chesapeake ● West Montgomery County Citizens Association
CBF Postcard Emails ● Mary Ann Friesen ● Wilson Barnes ● Janice Bennett ● Binyamin Biber ● Judi Bordeaux ● Bruce Boswell	77, 1-page Emails (77 pages) ● Joy Kroeger-Mappes ● Tacy Lambiase ● Cameron Larson ● Margaret Latimer ● Barbara Logan ● Ann Ludwig

- Stanley Bowser
- Valerie Brown
- Olivia Calvert
- Genevieve Cartwright
- Eugene Caruso
- Sarah Cayton
- Sarah Cayton
- Ralph Comegna
- Frank DeLucco
- Jack Demorra
- Amanda Dewey
- HarveyJesse DUBIN
- David Dunmire
- Christopher Ecker
- Dawn EybsJohnson
- Eyes of Paint Branch
- Gunnar Fisher
- John Flater
- Robert Flower
- Albert Garcia-Romeu
- Joanne Gregory
- Samuel Griffin
- Heidi H
- Alaina Hamacher
- Yolanda Harris
- Sandra Hawkins
- Levi Hilling
- Norman Hines
- Yvonne Irvin
- Phyllis Joris
- Darryl Jurkiewicz
- Britni Kirker
- Evan Krichevsky
- Ashley Matthews
- Annie Mesaros
- Gary Meyers
- Gary Meyers
- Jeffrey Mielke
- Peter Milenkowic
- Jane Miller
- Wally Minnick
- Meredith Mohr
- Susan Moody
- Bill Morgante
- stacey murrow
- Grace Nasrallah
- Kelly Ort
- Margaret Orto
- Deb Portney
- Gale Quist
- Tina Rhea
- Barbara risacher
- Iris Robertson
- Bruce Robson
- James Rosa
- Kurt Schwarz
- Richard Shannahan
- Omar Siddique
- Philip Spevak
- Terri Strassburger
- Heidi Strom Moon
- Rebecca Tran
- Tom Webb
- Allison Wheeler
- Allison Wright