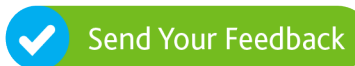


## ASSESSMENT

1 February 2024



### Analyst Contacts

**Vivian Lee**  
 Sustainable Finance Analyst  
 vivian.lee@moodys.com

**Donovan Hotz**  
 Sustainable Finance Associate  
 donovan.hotz@moodys.com

**Matthew Kuchtyak**  
 VP-Sustainable Finance  
 matthew.kuchtyak@moodys.com

# Washington Suburban Sanitary District, MD

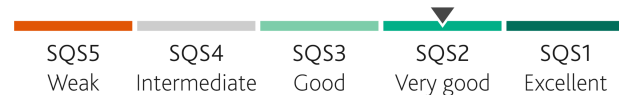
## Second Party Opinion – Green Financing Framework Assigned SQS2 Sustainability Quality Score

### Summary

We have assigned an SQS2 sustainability quality score (very good) to Washington Suburban Sanitary District's (WSSC Water) green financing framework dated 31 January 2024. The issuer has established a use-of-proceeds framework with the aim of financing projects across five eligible green categories. The framework is aligned with the four core components of the International Capital Market Association's (ICMA) Green Bond Principles (GBP) 2021 (with June 2022 Appendix 1). The framework demonstrates a significant contribution to sustainability.

### Sustainability quality score

# SQS2



### Alignment with principles USE OF PROCEEDS

#### Overall alignment



#### FACTORS

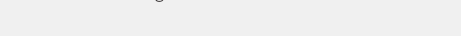


### Contribution to sustainability

#### Overall contribution



#### Expected impact Relevance and magnitude



#### ADJUSTMENTS

ESG risk management No adjustment  
 Coherence No adjustment

POINT-IN-TIME-ASSESSMENT

## Scope

We have provided a second party opinion (SPO) on the sustainability credentials of WSSC Water's green financing framework, including the framework's alignment with the ICMA's GBP 2021 (with June 2022 Appendix 1). Under the framework, the district plans to issue green bonds to finance projects across five eligible categories, as outlined in Appendix 2. During fiscal year 2024, the district plans to issue \$30 million of Consolidated Public Improvement Bonds of 2024 (Second Series) (Green Bonds) under its financing framework. These Series 2024 Green Bonds will finance projects across two of the five project categories contained in the issuer's framework, as outlined in Appendix 3.

Our assessment is based on the last updated version of the framework dated 31 January 2024, and our opinion reflects our point-in-time assessment<sup>1</sup> of the details contained in this version of the framework, as well as other public and non-public information provided by the issuer.

We produced this SPO based on our [Framework to Provide Second Party Opinions on Sustainable Debt](#), published in October 2022.

## Issuer profile

Washington Suburban Sanitary District provides water treatment and distribution, and wastewater collection and treatment to a population of two million in Montgomery and Prince George's counties in Maryland. The district's raw water is primarily supplied by the Potomac and Patuxent rivers with supplemental storage at four reservoirs, providing 27 billion gallons of additional supply. The district operates six wastewater treatment facilities with a combined capacity of about 96 million gallons of wastewater per day. As of fiscal year 2023, the system had approximately 479,000 water connections and approximately 451,000 sewer connections.

Water and wastewater utilities are primarily exposed to environmental risks stemming from water management and physical climate considerations. Given the nature of operations, the sustainable management of water resources is paramount to ensure the provision of safe and reliable water services. Water and wastewater utilities are also exposed to the increasing frequency and severity of climate related hazards which can inflict infrastructure damage if not addressed. Efforts to identify and address system vulnerabilities to the negative effects of climate change are crucial to minimize service disruption.

## Strengths

- » Financing of highly relevant projects under the framework addressing core environmental priorities for the district
- » Clearly defined and relevant environmental objectives associated with all eligible categories
- » Clear transparency on proceeds management in line with best market practice allowing for proper allocation to projects

## Challenges

- » Broad project category definitions limiting visibility on the likely extent of the benefits for some project categories
- » No independent impact assessment of environmental benefits and externalities associated with the financed projects

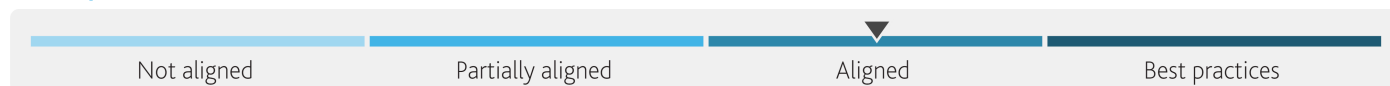
This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the issuer/deal page on <https://ratings.moody's.com> for the most updated credit rating action information and rating history.

## Alignment with principles

WSSC Water's green financing framework is aligned with the four core components of the ICMA's GBP 2021 (with June 2022 Appendix 1):

- Green Bond Principles (GBP)
- Social Bond Principles (SBP)
- Green Loan Principles (GLP)
- Social Loan Principles (SLP)
- Sustainability-Linked Bond Principles (SLBP)
- Sustainability Linked Loan Principles (SLLP)

## Use of proceeds



### Clarity of the eligible categories – ALIGNED

The district has defined the nature of expenditures, the eligibility criteria and the location of financed projects in Montgomery and Prince George's counties in Maryland. However, the framework lacks granular details on the eligibility criteria of projects for some eligible categories. Despite this lack of clarity at the framework level, the district has clearly outlined the use of proceeds in its past green bond issuances and commits to provide clear continued disclosure of projects to be financed for future green bond issuances.

Proceeds from the Series 2024 Green Bonds will be used to finance projects in its Potomac Water Filtration Plant (WFP) Consent Decree Program and its Large Water Pipe and Large Valve Rehabilitation Program, under the pollution prevention and control and water quality categories, respectively.

### Clarity of the environmental or social objectives – BEST PRACTICES

WSSC Water has clearly outlined the environmental objectives associated with each eligible category and they are set in coherence with the ICMA's GBP. The objectives include climate change mitigation, pollution prevention and control, sustainable water management, climate change adaptation and energy efficiency. All environmental objectives are relevant to their respective eligible categories.

### Clarity of expected benefits – ALIGNED

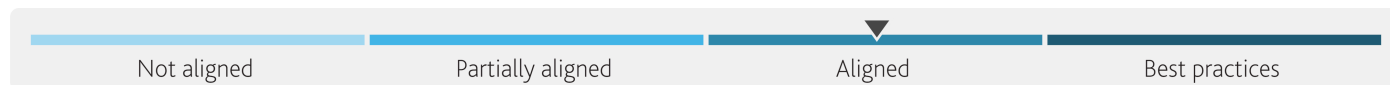
The district has identified relevant expected environmental benefits for each eligible project category that include the reduction in greenhouse gas (GHG) emissions, improvement in energy efficiency, reduction in water pollution, improvement in water quality and climate change adaptation. Although relevant and measurable impact indicators have been identified ex-ante for project categories that have been financed, indicators in the other project categories, namely the green buildings, renewable energy and climate change adaptation categories, have not been identified at the framework level. The district commits to provide relevant and measurable impact indicators appropriate to those projects when they are identified for financing in future disclosures.

In the event of refinancing, the estimated share of refinancing will be disclosed in the relevant bond documentation and a refinancing plan will be publicly disclosed detailing the bonds to be refunded. In the event of future refinancing issuances, the district commits to disclose details of selected projects to be reimbursed in its annual report.

### Best practices identified - use of proceeds

- » Objectives set are defined, relevant and coherent for all project categories
- » Relevant benefits are identified for all project categories
- » Commitment to transparently disclose the share of proceeds used for refinancing where feasible
- » Commitment to transparently communicate the associated lookback period(s) where feasible

## Process for project evaluation and selection



### Transparency and quality of process for defining eligible projects – ALIGNED

The district has established a clear process for determining the eligibility of projects, with granular decision-making criteria disclosed in the framework. Eligible green bond projects are identified and selected through its annual six-year capital improvement program (CIP) process. Projects are evaluated to align with the district's 30-year asset management plan and include engineering and demographic data to ensure that projected capital and service needs are met. The process incorporates input from relevant internal expertise including the general manager and district commissioners as well as an external review process with the bi-county government and the Maryland National Capital Parks and Planning Commission for project validation. WSSC Water will monitor the continued compliance of projects to the eligibility criteria annually until a project has been fully funded. The CIP process is documented via public commission hearings.

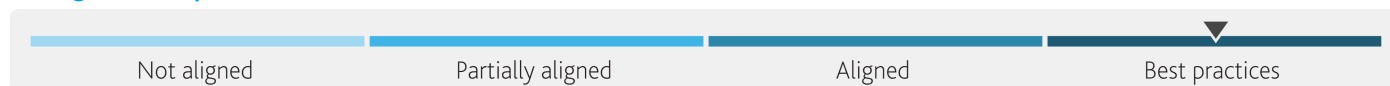
### Environmental and social risk mitigation process – ALIGNED

WSSC Water has established an environmental risk mitigation process in which financed projects are selected based on their adherence to environmental management goals and all applicable laws, rules and regulations, including the US Environmental Protection Agency's (EPA) Clean Water Act and Safe Drinking Water Act. Eligible capital projects undergo environmental impact assessments to identify and minimize potential environmental and social risks associated with projects as part of the CIP process. Additionally, the district's occupational health and safety program outlines measures to prevent work site accidents. Potential project controversies are identified through the district's review and project validation process embedded in its CIP program.

### Best practices identified - process for project evaluation and selection

- » The roles and responsibilities for project evaluation and selection are clearly defined and include relevant expertise
- » The process for project evaluation and selection is traceable
- » Material environmental and social risks for most project categories are identified
- » Presence of corrective measures to address environmental and social risks across projects

## Management of proceeds



### Allocation and tracking of proceeds – BEST PRACTICES

The district has defined a clear process for the management and allocation of bond proceeds in its publicly available framework and bond documentation. Net proceeds from bonds issued under the framework will be placed in a segregated account exclusively for green bond project allocation, and tracked under a formalized internal process. The framework and relevant bond documents provide clear disclosure on proceeds management for the benefit of bondholders. Proceeds will be adjusted and matched against project expenditures on a quarterly basis and will be allocated to eligible projects within a 12 month period following the bond issuance date. In case of refunding, proceeds will be allocated immediately to eligible projects.

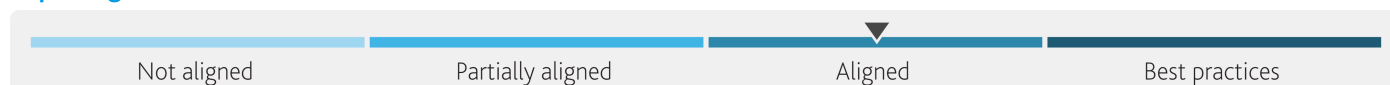
### Management of unallocated proceeds – BEST PRACTICES

The management of unallocated proceeds will follow WSSC Water's investment policy which conforms to the state's law on the investment of public funds. Per the policy, unallocated proceeds are primarily invested in US government obligations, its agencies, or instrumentalities, repurchase agreements and bankers' acceptances. WSSC Water has committed to reallocate funds to other eligible projects within the framework in case a project is postponed, canceled, divested or no longer meets the eligibility criteria.

### Best practices identified - management of proceeds

- » Broad disclosure of a clearly articulated and comprehensive management of proceeds policy to external stakeholders; bondholders or lenders at a minimum
- » Short allocation period, for example typically less than 24 months
- » Commitment to reallocate proceeds to projects that are compliant with the framework

## Reporting



### Transparency of reporting – ALIGNED

WSSC Water will report on the use of proceeds of bonds issued under the framework annually until full allocation and in the case of material developments. The report will be available on its website and posted on the Electronic Municipal Market Access (EMMA) website of the Municipal Securities Rulemaking Board. Reporting will include details on the specific projects funded, the amount allocated to each project and the expected environmental benefits of the projects.

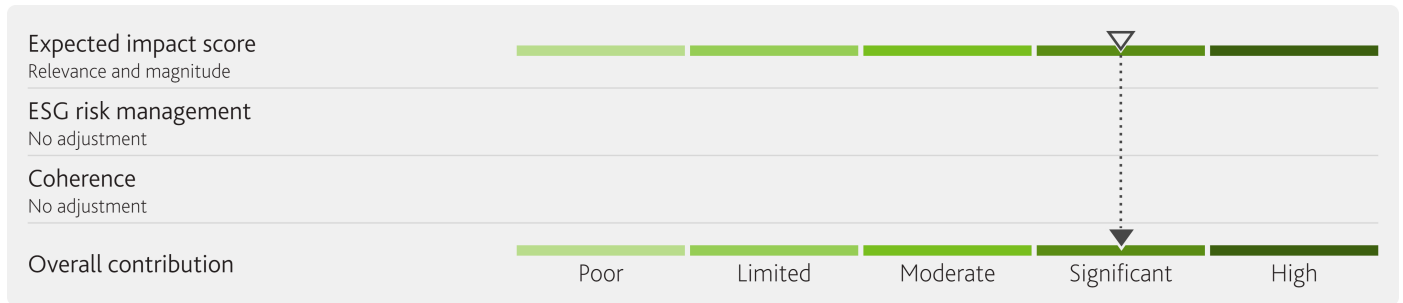
The district has identified relevant environmental impact indicators for the projects to be financed under the Series 2024 Green Bonds but has not identified indicators for the remaining eligible categories. Calculation and reporting methodologies related to projects under the consent decree are publicly available. However, there is limited visibility on whether the calculation methodologies associated with other eligible projects will be disclosed. The allocation of funds will be independently verified by an auditor annually. Although environmental benefits are not externally verified at this time, the district plans to obtain an independent assessment beginning in fiscal year 2025.

### Best practices identified - reporting

- » Reporting covers material developments and issues related to the projects or assets
- » Reporting on allocation of proceeds and benefits done at least at eligible category level
- » Exhaustive allocation reporting – balance or % of unallocated funds, types of temporary investments (e.g. cash or cash equivalent) and share of financing vs re-financing
- » Independent audit of the tracking and allocation of funds at least until full allocation and in case of material changes

### Contribution to sustainability

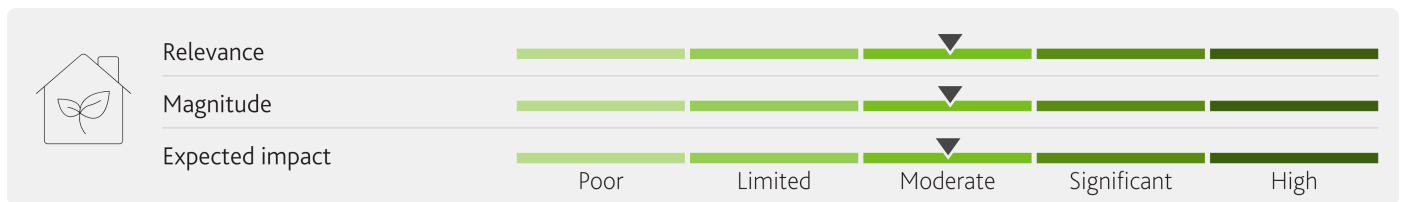
The framework demonstrates a significant overall contribution to sustainability.



### Expected impact

The expected impact of the eligible projects on environmental objectives is significant. Based on historical and near term allocations, including the Series 2024 Green Bonds, we expect a higher proportion of proceeds allocation to the pollution prevention and control and water quality project categories. We have therefore assigned a higher weight to those categories in our assessment of the overall framework's contribution to sustainability. A detailed assessment by eligible category is provided below.

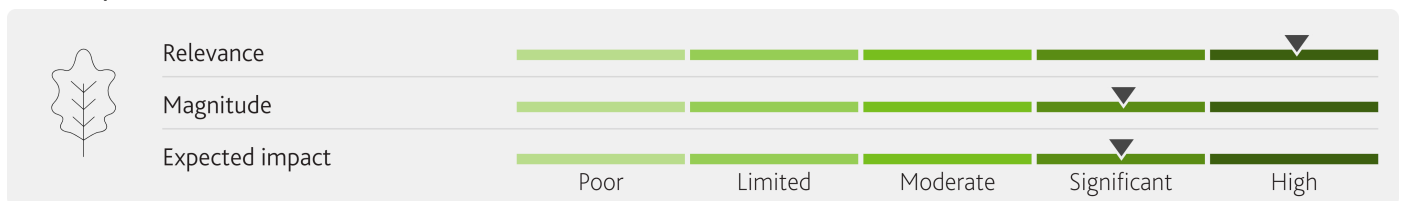
#### Green buildings/facilities



Measures to promote energy efficiency are indirect decarbonization strategies to reduce energy consumption in the water and wastewater utility sector. Although eligible projects in this category are important, they are moderately relevant solutions to address the district's core environmental challenges because energy emissions from buildings and pumping represent just 10% of total emissions, according to its [2022 Greenhouse Gas Action Plan](#).

We expect projects will likely have a moderately positive impact through energy efficiency improvements in buildings and facilities. Eligible projects include the installation of high-efficiency heating and cooling units, LED lighting fixtures and high efficiency water and wastewater equipment such as pumps, motors and valves. Although no lock-in effects are identified, the extent of the benefits is constrained by the absence of an energy efficiency threshold and standard to which eligible projects will adhere. However, the district has shared that the typical energy savings for replaced equipment is 25%, which provides reasonable assurance of the expected energy improvement from potential projects.

#### Pollution prevention and control

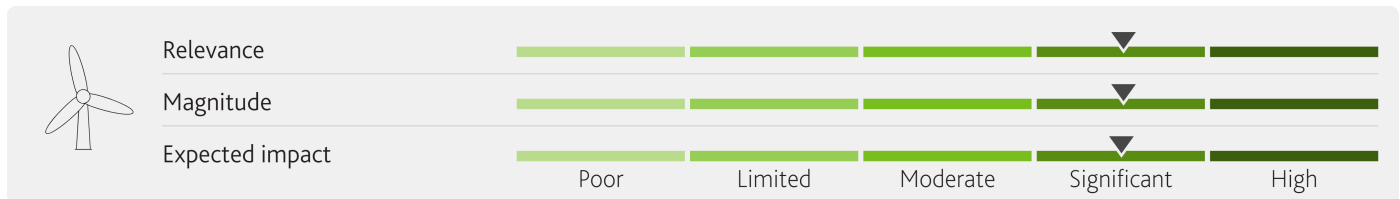


Projects under this category are highly relevant investments to prevent and control water pollution within the sector and local context. In 2016, WSSC Water entered into a consent decree with the state and environmental groups related to excessive discharges at its Potomac WFP into the Potomac River during peak flow periods. Through the consent decree, the district is required to undertake operational changes and capital improvements at the plant to reduce the amount of suspended solids (sediments) discharged to the river and to construct system improvements to meet new discharge limits. The adopted six-year capital improvement plan

(2024-2029) identifies roughly \$129 million of improvements, highlighting the importance of projects to support compliance with the Potomac WFP consent decree program.

The projects will likely have significant long term benefits through the reduction in sediment pollutants to the Potomac River and the avoidance of lock in effects. As of January 2024, the district has achieved solids removal of 86.4%, with the ultimate goal of eliminating all sediment discharges by January 2026. The continued investments are expected to contribute to the district's sediment elimination goal and in turn support healthy waterways. Other eligible projects in this category include sewer system upgrades to prevent sanitary sewer overflows and enhanced nutrient removal. The significant magnitude captures the lack of visibility on the net average energy consumption for water treatment and limited information on the expected improvement in biodiversity protection, one of the potential environmental benefits the district identified for the project.

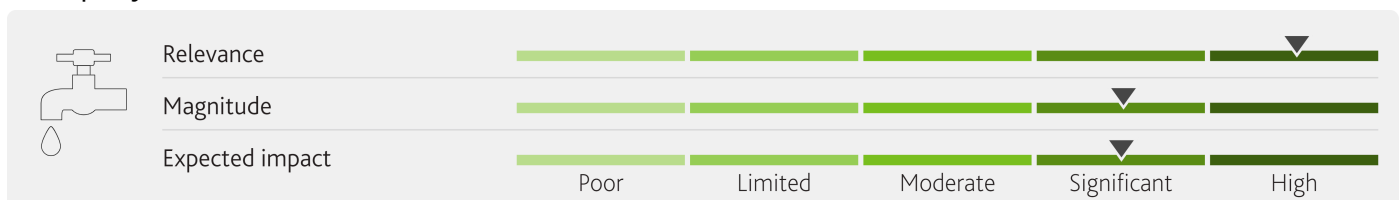
**Renewable energy**



Investments supporting the energy transition to renewable energy sources addresses a significantly relevant environmental issue for the district. Projects under this category will support the construction of a bioenergy facility using biosolids collected from its water recovery facilities. Although the water utility sector is responsible for just 2% of national energy consumption<sup>2</sup>, electricity use for treatment services represents the largest share of total energy use given the energy intensive processes required to treat water and wastewater. According to the district's 2022 Greenhouse Gas Action Plan, Scope 2 emissions accounted for approximately 75% of total emissions, primarily from the energy used for treatment services. Measures to shift to renewable energy sources is a direct decarbonization strategy to limit energy-related emissions from the treatment and distribution process. While the reduction in emissions is an important environmental consideration, other environmental concerns, such as sustainable water management and pollution prevention and control are viewed as higher environmental priorities for the district.

We expect projects to have a significantly positive contribution to sustainability on climate change mitigation. Eligible feedstocks for bioenergy projects include biosolids produced from the district's water recovery facilities and will be transformed to bioenergy via thermal hydrolysis and anaerobic digestion processes. The district has shared that its Piscataway bioenergy plant – an example of a project that could be financed under this category in the future – is designed to ensure that methane gas from biosolids will be fully captured and upgraded to renewable natural gas. The bioenergy produced can offset the energy use for treatment processes and contribute surplus energy to the power grid. Although biofuel production for electricity will likely reduce negative effects, the category lacks details on the emission thresholds related to the production of bioenergy.

**Water quality**

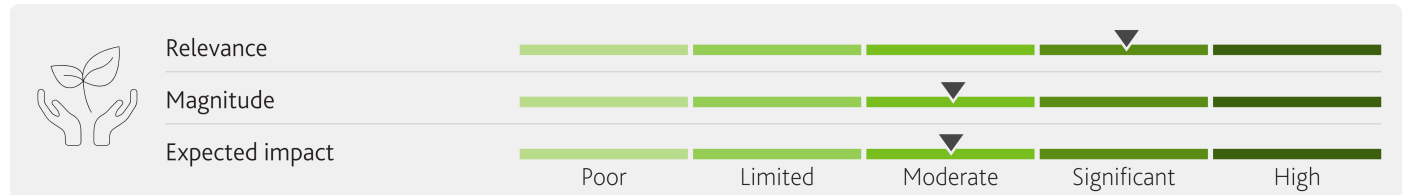


Projects under this category are highly relevant to address the district's core sustainability issue given its mandate to provide safe and reliable water and wastewater services to its service area. Population growth in the face of more stringent water quality regulations increases the need for continuous capital upgrades to ensure water quality standards are maintained. The district recorded 18.6% of water loss in fiscal year 2022, highlighting the need to replace and renew aging infrastructure to minimize service disruption.

The category will likely generate a significantly positive long-term impact to ensure water system quality and reliability. Proceeds from the upcoming Series 2024 Green Bonds issuance will be used in part to upgrade aging water transmission assets through the replacement of water pipes and valves which will likely deliver reduction in water losses and system leaks. Per the requirement of the

state's Department of Environment, WSSC Water has prepared a water loss reduction plan to reduce water leakage levels through water conservation efforts such as metering accuracy and replacement, pressure monitoring and leak detection technologies. Based on the district's most recent water audit report for fiscal year 2023, operating indicators show an Infrastructure Leakage Index (ILI) of 1.4, in line with market recognized thresholds of levels 1.5 and below for effective mitigation to climate change. However, the category lacks granular details on other eligible projects to be financed under the category and whether these projects will employ best available technologies.

### Climate change adaptation



Projects in this category are significantly relevant to reduce the vulnerability of infrastructure in the face of rising climate change risks. Investments in climate adaptation assets are important to mitigate the risks of climate induced hazards to infrastructure and to enhance system resiliency in the face of increasing intensity of extreme weather events.

The magnitude is moderate in adapting the system to increasing climate change risks. The eligible projects include infrastructure to improve the adaptability of assets to physical climate risks such as the improvement of safety standards including the probable maximum flood criteria. Examples of potential projects include flood proofing vulnerable facilities by sealing flood pathways and entryways, and placement of automatic valves over the floor drain in eight identified vulnerable sites. The sites most vulnerable to climate change risks were identified through an enterprise wide climate vulnerability assessment using the US Federal Emergency Management Agency's (FEMA) 100-year floodplain data. Other eligible projects include enhancing system reliability at wastewater treatment facilities to prevent sanitary sewer overflows. Although no lock-in effects are identified, the category lacks visibility on whether the adaptation solutions will follow the best available solutions to mitigate the specific climate risk. Additionally, some of the example projects in the framework may not directly contribute to climate change adaptation in a comprehensive manner.

### ESG risk management

We have not applied a negative adjustment for ESG risk management to the expected impact score. Management of ESG externalities are incorporated in the district's capital improvement planning process that includes participation from relevant internal and external stakeholders. All eligible projects proceed under applicable environmental permits and undergo environmental impact assessments in compliance with federal and state laws and regulations. Although the nature of operations can create responsible production risks, the district conducts regular water audits and water quality tests that follow state regulations and the US EPA's Safe Drinking Water regulations. Other social risks stemming from the health and safety of workers are addressed in the district's comprehensive occupational health and safety guidelines.

### Coherence

We have not applied a negative adjustment for coherence to the expected impact score. Projects to be financed under WSSC Water's framework align with its broader sustainability priorities, including its overall mission of providing safe and reliable water while returning clean water to the environment. Financed projects also align with WSSC Water's stated overall goal to reduce GHG emissions to net zero by 2050.



## Appendix 1 - Mapping eligible categories to the United Nations' Sustainable Development Goals

The five eligible categories included in WSSC Water's framework are likely to contribute to five of the United Nations' Sustainable Development Goals (SDGs), namely:

UN SDG 17 Goals	Eligible Category	SDG Targets
GOAL 6: Clean Water and Sanitation	Pollution prevention and control, Water quality Water quality	6.3: Improve water quality by reducing pollution, eliminating dumping and minimizing hazardous chemicals and materials 6.4: Increase water-use efficiency across all sectors and ensure sustainable supply of freshwater to reduce water scarcity
GOAL 7: Affordable and Clean Energy	Renewable energy	7.2: Increase substantially the share of renewable energy in the global energy mix
GOAL 9: Industry, Innovation and Infrastructure	Climate change adaptation, Green buildings	9.4: Upgrade infrastructure and retrofit industries to make them sustainable, with all countries taking action
GOAL 14: Life Below Water	Pollution prevention and control, Water quality	14.1: Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities
GOAL 15: Life on Land	Pollution prevention and control, Water quality	15.1: Ensure the conservation and sustainable use of terrestrial and inland freshwater ecosystems and their services

The United Nations' Sustainable Development Goals (SDGs) mapping in this SPO considers the eligible project categories and associated sustainability objectives/benefits documented in the issuer's financing framework, as well as resources and guidelines from public institutions, such as the ICMA SDG Mapping Guidance and the UN SDG targets and indicators.

## Appendix 2 - Summary of eligible categories in WSSC Water's framework

Eligible Category	Description	Sustainability Objectives	Provided Reporting Metrics
Green buildings/facilities	<ul style="list-style-type: none"> <li>• Installation of high-efficiency heating, ventilating and air conditioning units;</li> <li>• Installation of high-efficiency light emitting diode (LED) lighting fixtures;</li> <li>• Use of cool roof materials; and</li> <li>• Installation of high-efficiency water and wastewater processing equipment, pumps, motors, and valves.</li> </ul>	<ul style="list-style-type: none"> <li>• Energy efficiency</li> <li>• Climate change mitigation</li> </ul>	N/A
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Lead clean-up and removal;</li> <li>• Protection of environmentally sensitive areas from sewer overflow;</li> <li>• Construction of new sewer, storm drain and recycled water supply systems;</li> <li>• Sewer system rehabilitation to prevent overflow in waterways;</li> <li>• Sewer line blockage assessments; and</li> <li>• Enhanced nutrient removal (nitrogen and phosphorus) and discharge processes to protect waterways.</li> </ul>	<ul style="list-style-type: none"> <li>• Pollution prevention and control</li> </ul>	<ul style="list-style-type: none"> <li>• Percentage of river solids removed</li> </ul>
Renewable energy	<ul style="list-style-type: none"> <li>• Installation of new equipment and systems to produce bio-gas and electricity.</li> </ul>	<ul style="list-style-type: none"> <li>• Climate change mitigation</li> </ul>	N/A
Water quality	<ul style="list-style-type: none"> <li>• Sewer and water line reconstruction for cleaner drinking water;</li> <li>• Leak detection technologies;</li> <li>• Advanced mixing systems;</li> <li>• Installation of technologies to reduce chemical use; and</li> <li>• Construction of intake channel to reduce drinking water contamination and treatment.</li> </ul>	<ul style="list-style-type: none"> <li>• Sustainable water management</li> </ul>	<ul style="list-style-type: none"> <li>• Miles of large diameter water mains replaced annually</li> </ul>
Climate change adaptation	<ul style="list-style-type: none"> <li>• Address safety standards including the Probable Maximum Flood criteria and maximum credible earthquake loadings;</li> <li>• Install enhanced power reliability equipment at water resource recovery facilities and wastewater pumping stations to prevent sanitary sewer overflows; and</li> <li>• Reduce biosolids production to enhance health of Chesapeake Bay and reduce greenhouse gas emissions and other air pollutants.</li> </ul>	<ul style="list-style-type: none"> <li>• Climate change adaptation</li> </ul>	N/A

## Appendix 3 - Summary of the proposed Series 2024 Green Bonds

Eligible Category	Series 2024 Green Bond Project Description	Estimated Project Timeline	Expected Amount (\$ million)
Pollution prevention and control	<p>Potomac WFP Consent Decree Program (W-73.33)</p> <p>The Potomac WFP Consent Decree Program provides for the planning, design, and construction required for the implementation of Short-Term Operational and Long-Term Capital Improvements at the Potomac Water Filtration Plant (WFP) to allow WSSC Water to meet the new discharge limitations identified in the Consent Decree.</p>	February 2024 through November 2024	\$20
Water quality	<p>Large Diameter Water Pipe &amp; Large Valve Rehabilitation Program (W-161.01)</p> <p>The purpose of this Program is to plan, inspect, design, and rehabilitate or replace large diameter water transmission mains and large system valves that have reached the end of their useful life. Condition assessment and/or corrosion monitoring is performed on metallic pipelines, including ductile iron, cast iron, and steel, to identify lengths of pipe requiring replacement or rehabilitation and cathodic protection.</p> <p>Rehabilitation or replacement of these mains provides value to the customer by minimizing the risk of failure and ensuring a safe and reliable water supply.</p>	February 2024 through November 2024	\$10

## Endnotes

<sup>1</sup> Point-in-time assessment is applicable only on date of assignment or update.

<sup>2</sup> [Sustainable Water Infrastructure, Energy Efficiency for Water Utilities](#), US Environmental Protection Agency, accessed January 2024

Moody's assigns SPOs in alignment with the main tenets of the ICMA Guidelines for Green, Social, Sustainability and Sustainability-Linked Bonds External Reviews and the LSTA/LMA/APLMA Guidance for Green, Social and Sustainability-Linked Loans External Reviews, as applicable; Moody's practices may however diverge in some respects from the practices recommended in those documents. Moody's approach to assigning SPOs is described in its Assessment Framework, and is subject to the ethical and professional principles set forth in the Moody's Investors Service Code of Professional Conduct.

Additional terms with respect to Second Party Opinions (as defined in Moody's Investors Service Rating Symbols and Definitions): Please note that a Second Party Opinion ("SPO") is not a "credit rating". The issuance of SPOs is not a regulated activity in many jurisdictions, including Singapore. JAPAN: In Japan, development and provision of SPOs fall under the category of "Ancillary Businesses", not "Credit Rating Business", and are not subject to the regulations applicable to "Credit Rating Business" under the Financial Instruments and Exchange Act of Japan and its relevant regulation. PRC: Any SPO: (1) does not constitute a PRC Green Bond Assessment as defined under any relevant PRC laws or regulations; (2) cannot be included in any registration statement, offering circular, prospectus or any other documents submitted to the PRC regulatory authorities or otherwise used to satisfy any PRC regulatory disclosure requirement; and (3) cannot be used within the PRC for any regulatory purpose or for any other purpose which is not permitted under relevant PRC laws or regulations. For the purposes of this disclaimer, "PRC" refers to the mainland of the People's Republic of China, excluding Hong Kong, Macau and Taiwan.

© 2024 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

**CREDIT RATINGS ISSUED BY MOODY'S CREDIT RATINGS AFFILIATES ARE THEIR CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED OR OTHERWISE MADE AVAILABLE BY MOODY'S (COLLECTIVELY, "MATERIALS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE APPLICABLE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER OPINIONS INCLUDED IN MOODY'S MATERIALS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S MATERIALS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES OR OTHERWISE MAKES AVAILABLE ITS MATERIALS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.**

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS, AND MATERIALS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS OR MATERIALS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT. FOR CLARITY, NO INFORMATION CONTAINED HEREIN MAY BE USED TO DEVELOP, IMPROVE, TRAIN OR RETRAIN ANY SOFTWARE PROGRAM OR DATABASE, INCLUDING, BUT NOT LIMITED TO, FOR ANY ARTIFICIAL INTELLIGENCE, MACHINE LEARNING OR NATURAL LANGUAGE PROCESSING SOFTWARE, ALGORITHM, METHODOLOGY AND/OR MODEL.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the credit rating process or in preparing its Materials.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING, ASSESSMENT, OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any credit rating, agreed to pay to Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it. MCO and Moody's Investors Service also maintain policies and procedures to address the independence of Moody's Investors Service credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service, Inc. and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at [www.moody.com](http://www.moody.com) under the heading "Investor Relations — Corporate Governance — Charter Documents - Director and Shareholder Affiliation Policy."

Moody's SF Japan K.K., Moody's Local AR Agente de Calificación de Riesgo S.A., Moody's Local BR Agência de Classificação de Risco LTDA, Moody's Local MX S.A. de C.V., I.C.V., Moody's Local PE Clasificadora de Riesgo S.A., and Moody's Local PA Calificadora de Riesgo S.A. (collectively, the "Moody's Non-NRSRO CRAs") are all indirectly wholly-owned credit rating agency subsidiaries of MCO. None of the Moody's Non-NRSRO CRAs is a Nationally Recognized Statistical Rating Organization.

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657 AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for India only: Moody's credit ratings, Assessments, other opinions and Materials are not intended to be and shall not be relied upon or used by any users located in India in relation to securities listed or proposed to be listed on Indian stock exchanges.

Additional terms with respect to Second Party Opinions (as defined in Moody's Investors Service Rating Symbols and Definitions): Please note that a Second Party Opinion ("SPO") is not a "credit rating". The issuance of SPOs is not a regulated activity in many jurisdictions, including Singapore. JAPAN: In Japan, development and provision of SPOs fall under the category of "Ancillary Businesses", not "Credit Rating Business", and are not subject to the regulations applicable to "Credit Rating Business" under the Financial Instruments and Exchange Act of Japan and its relevant regulation. PRC: Any SPO: (1) does not constitute a PRC Green Bond Assessment as defined under any relevant PRC laws or regulations; (2) cannot be included in any registration statement, offering circular, prospectus or any other documents submitted to the PRC regulatory authorities or otherwise used to satisfy any PRC regulatory disclosure requirement; and (3) cannot be used within the PRC for any regulatory purpose or for any other purpose which is not permitted under relevant PRC laws or regulations. For the purposes of this disclaimer, "PRC" refers to the mainland of the People's Republic of China, excluding Hong Kong, Macau and Taiwan.

REPORT NUMBER 1393891