

# **Conservation Investment Blueprint: Environmental Impact Bond for Green Infrastructure**

*Developed based on the Case Study for Watershed Protection in Washington, D.C.  
by Quantified Ventures*

## *i. Overview of the conservation need and opportunity*

Washington, D.C. rests on the banks of two rivers – the Potomac and the Anacostia – that flow into the Chesapeake Bay. Like many cities across the United States, DC has a combined sewer system that mixes stormwater runoff with household sewage. When storms overwhelm the treatment facility, the combined sewage overflow (CSO) drains waters high in Nitrogen, Phosphate, and Sediment into the rivers, reducing aquatic life and making waterways unsafe for fishing and recreational purposes. With other signs of an improving Potomac River and Chesapeake Bay, stormwater runoff is the only growing pollutant<sup>i</sup>.

The DC Clean Rivers Project includes the world’s first environmental impact bond (EIB) to reduce stormwater runoff and combined sewage overflows. Through green infrastructure, water is retained on land through natural processes. As George Hawkins, former CEO of DC Water, said, “...instead of [rainwater] being a problem that we channel into a pipe and get rid of, we’re holding it into the ground and acting as what water is, an asset”<sup>ii</sup>. Highly scalable and replicable, a pay for success EIB can be used to spread the performance risk associated with green infrastructure to impact investors, allowing for greater adoption of green infrastructure and meeting desired outcomes of the project.

### **Scale and scope of activities required to address conservation need and opportunity**

DC Water serves 2.3 million customers within 725 square miles. The Potomac River is 383 miles long, but with tributaries, including DC’s Anacostia River, it is 12,878.8 miles in total. It extends from the Appalachian Plateau to the Coastal Plain where it meets the Chesapeake Bay.

## *ii. Describing how the Blueprint contributes to conservation goals*

### **Contributions to Conservation Goal**

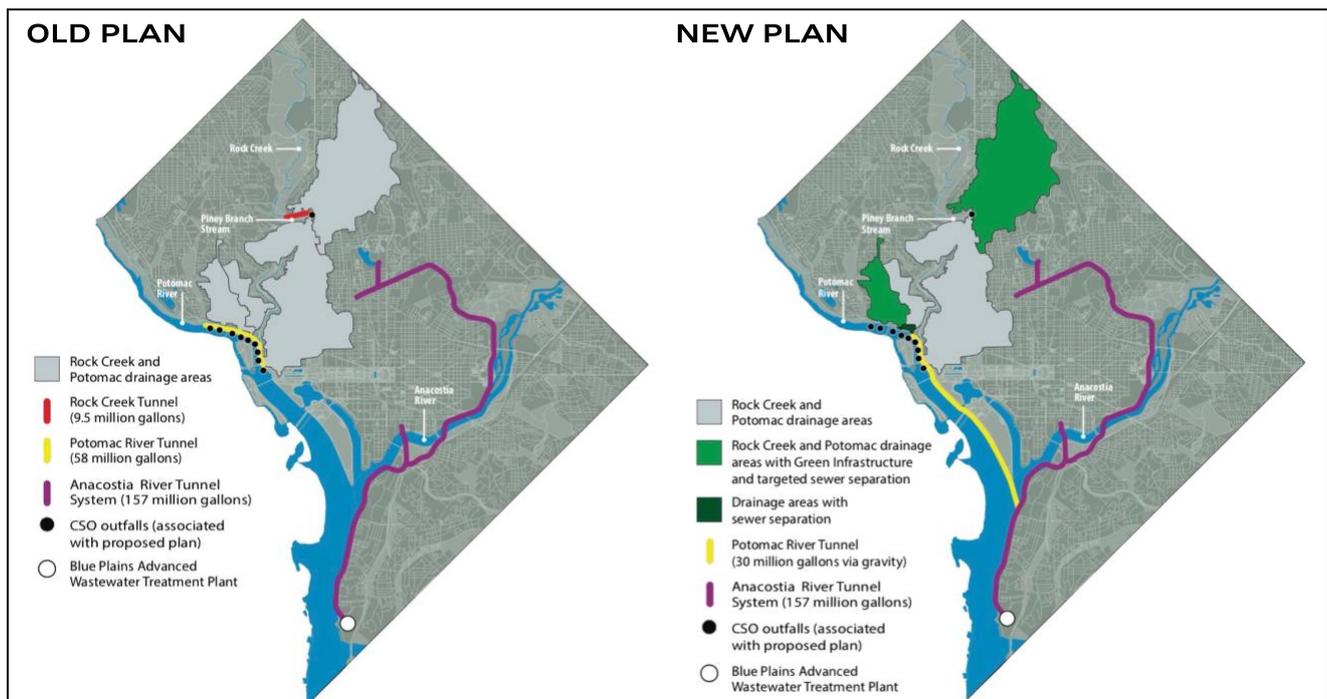
The Green infrastructure projects replace the performance gains of the originally planned 9.5 million gallon pipeline to channel stormwater runoff to the water treatment facility. It improves water quality, reduces burden on water treatment, mitigates and prevents residential flooding, strengthens climate change resiliency, and increases the quality of life of residents in their neighborhoods, the waterfront, and waterway for recreation. As part of the overall DC Clean Rivers Project, the 498 acres of land managed by green infrastructure will contribute to the reduction of stormwater overflow releases into the Potomac Watershed by 96 % when completed in 2023<sup>iii</sup>.

### **Key Metrics**

The DC Clean Rivers Project is designed and engineered to achieve the following environmental and social outcomes<sup>iv</sup>:

- **Water Quality:** Improve water quality by capturing and treating CSOs before entering the District’s rivers and waterways.
- **Climate Resilience:** Promote climate resilience, with the objective of flood relief and mitigation.
- **Quality of Life:** Enhance the quality of life associated with restoring the District’s rivers, waterways, and waterfront areas by removing harmful contaminants and pollutants
- **Responsible Management:** DC Water has also committed to report on the responsible management of the DC Clean Rivers Project on the degree of implementation of select environmental, social, and governance (ESG) criteria at the project level. The criteria are organized into five ESG domains: Human Rights, Human Resources, Environment, Business Behavior, and Community Involvement.

For the green infrastructure encompassing 20 acres of Rock Creek Park that was funded by the EIB, it was and will continue to be measured for effectiveness with flow meters monitoring stormwater flow off the sites.



**A CPIC-branded investment blueprint needs to demonstrate clear and measurable impacts on biodiversity conservation.** This can happen through interventions that are designed to ameliorate threats to biodiversity, at the species or ecosystem level. Influence over the delivery of ecosystem flows that benefit people is also desirable.

Threats to biodiversity can be assessed at a spatial scale using the Integrated Biodiversity Assessment Tool (<https://ibat-alliance.org>). The first step is to assess what biodiversity assets exist in proximity to project sites using the proximity tool of IBAT. Once threatened species, Key Biodiversity Areas and protected areas in the vicinity of the site are identified, then each of these have listings of threats to biodiversity that can be influenced by the investment opportunity. An example would be the reduction in pollution of biodiversity-rich rivers from investments in reforestation.

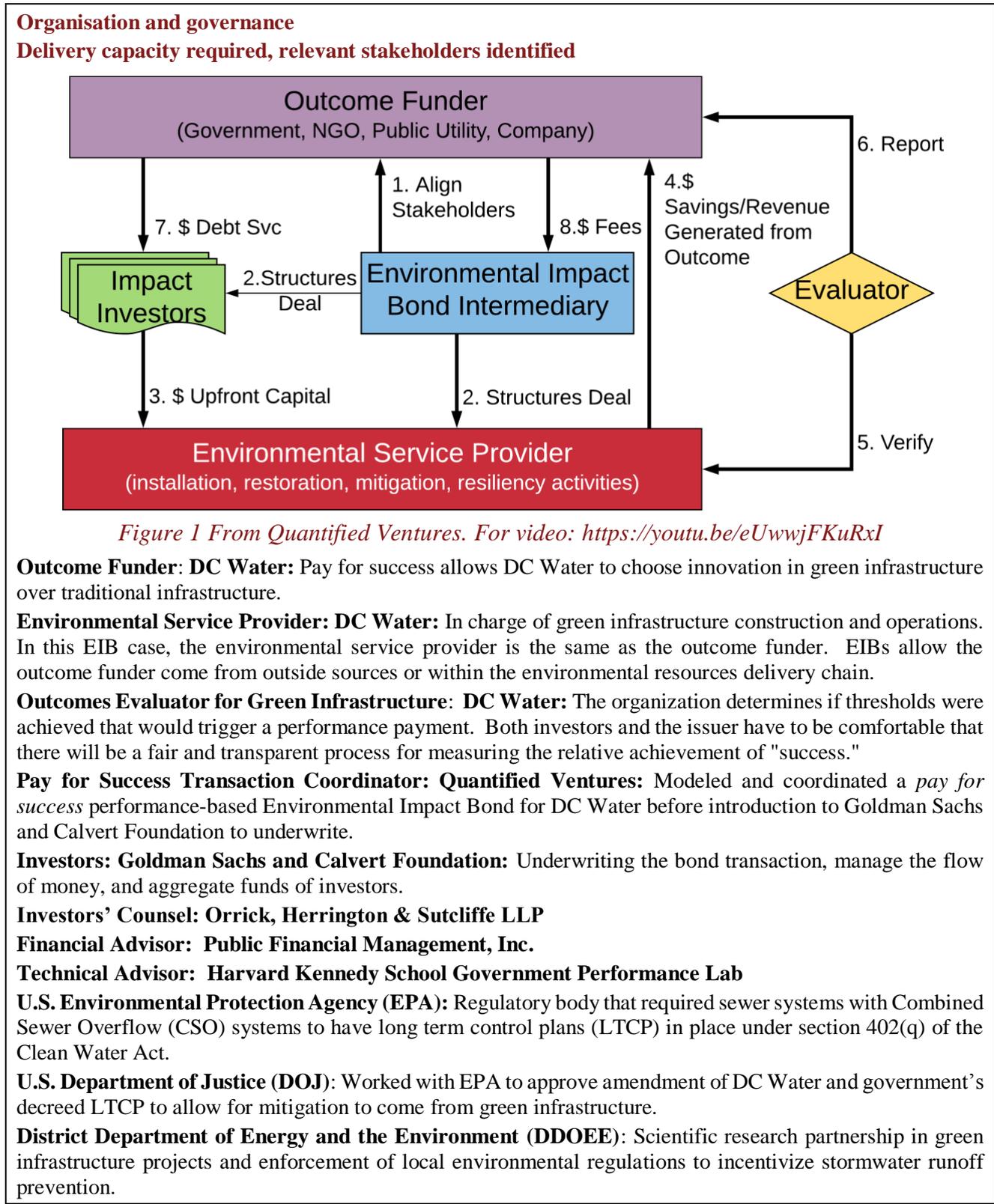
**A clear statement of the planned reduction in threats to biodiversity that will be generated by the investment is necessary to justify priority status as a CPIC blueprint.** In the first stage of project development, a simple assessment of the project proximity to biodiversity asset and the link between the impacts of investment and the reduction of threats is sufficient. Once investment activity is confirmed, a more detailed assessment of potential return on investment for biodiversity is required. A module to calculate this is under development for IBAT. This biodiversity return on investment can be calculated ex-ante, as a means of assessing opportunities for impact, and ex-post, once the investment is confirmed and management starts.

A first assessment of the impacts of the investment on ecosystem services to people can be made through the use of the TESSA tool (<http://tessa.tools>). A more detailed assessment of the tools available for conservation assessments, forest landscape restoration planning landscape assessment generally, and biodiversity management is available in the Conservation Investment Blueprints: A Development Guide available on the CPIC website (<http://cpicfinance.com/related-reports>).

### *iii. The business model*

The DC Waters Clean Rivers Project was initiated to comply with the Clean Water Act of 2004<sup>v</sup>, by increasing sewage capacity with new larger pipes that run through the city to an improved treatment facility. The plan was augmented to have green infrastructure replace an additional pipe for collection of stormwater runoff through the neighborhoods adjacent to Rock Creek, a national park and tributary of the Potomac River. Green

infrastructure buffered the natural landscape of Rock Creek Park from the stormwater runoff from the city streets.



**District of Columbia Residents and Beyond:** Residents are key beneficiaries in the environmental and social outcomes. DC Water’s Green Bond Report (2017 revised) outlines these benefits as “improved water quality...climate resilience with flood relieve and mitigation...[and] quality of life associated with restoring the District’s rivers, waterways, and waterfront areas by removing harmful contaminants and pollutants.” Further, Mayor Muriel Bowser at the Green Infrastructure project kick-off stated, “These projects will build greener and more attractive neighborhoods, create local jobs, and improve the health, quality, and flow of our local rivers”. Residents along the Potomac River outside of the District (including Arlington and Alexandria in Virginia and Prince George’s Country and others along the Chesapeake Bay) will all benefit from the actions the District takes.

**Commercial Fishers, Crabbers, Tourism and Recreation:** Though not an active role in the bond transaction or Clean Rivers Project, the fishing and crabbing industries are key businesses for the Chesapeake Bay Region. Improved water quality entering from the Potomac River will improve catch yields that were steadily declining before the DC Clean Rivers project. In future transactions, these groups would have incentives to be impact investors.

**Product Being Sold**

**Green Infrastructure in Rock Creek, Washington, D.C.**

- The proceeds from the EIB will provide the upfront capital needed to construct DC Water’s inaugural 20-acre green infrastructure project in the Rock Creek sewershed (Rock Creek Project A or RC-A).
- RC-A is part of the DC Clean Rivers Project, a \$2.6 billion long-term program to control CSOs that pollute the Anacostia River, Potomac River, and Rock Creek.
- The green infrastructure practices will be installed primarily in the public right-of-way and include permeable pavement and bioretention facilities (e.g., rain gardens)<sup>vi</sup>.

**Revenue Model**

This project uses a recurring revenue model. DC Water utility rate payors pay for access to water services in recurring payments.

**Cash flows and commercial sustainability**

DC Water, an entity of the Government of the District of Columbia, issues the EIB that was purchased by impact investors Goldman Sachs and Calvert Foundation. DC Water collects revenue from the rate-payers as their water utility across Washington, D.C. and adjacent jurisdictions. These revenues go to pay the bond holder of the duration of the bond.

**Benefits To Issuer: DC Water**

DC Water benefits by receiving funds for the Clean Rivers Project and by meeting the Clean Water Act standards faster and at lower costs to annual budgets. Value added to services provided to retail water customers. They have the ability to meet current and future demand with resiliency to climate change.

**Benefits to Investors: Goldman Sachs and Calvert**

Impact investors can include the bond in their portfolio to meet their conservation goals with a sector average risk of AA rated municipal bond.

**Benefits to deal coordinators, advisors, auditors and counsel**

Fees for services rendered.

**Benefits to District of Columbia Residents and Beyond**

The bond provides payors (DC water customers) with services provided for cleaner drinking water, greener neighborhoods, reduced urban heat islands, cleaner waterfronts, restoration of waterways for recreation, and reduction in nuisance floods. The projects will also create jobs within the community to serve the community.

**Benefits to DDOE, EPA and DOJ**

DC will be one municipality able to meet new standards established in the Clean Water Act in a shorter timeframe. The bond serves as an example to other municipalities to use DC Water as a blueprint for their own CSO mitigation strategy. This also validates enforcement of the Clean Water Act as being achievable within normal budget constraints throughout the country.

**Benefits to Commercial Fishing, Tourism, and Recreation**

A cleaner Chesapeake Bay watershed is beneficial for fish and crab populations. Waterfront attractions and recreation become more appealing and have higher value.

**External dependencies**

- Regulation** Having the Clean Water Act and complementary DOEE regulations was the force in creating the EIB. Continued commitment at the federal and local levels will be important to keep political will to issue future bonds for this project as needed.
- Risk Assessment** Project operation and environmental risk assessment from financial intermediaries during underwriting and by rating firms set the bond rate and evaluate the shared risk between the bond issuer and investors. This establishes the bond rate which can affect the affordability of the project or its time table.
- Construction Firms Expertise** Access to qualified providers of green infrastructure and tunnel construction services. Training programs in green infrastructure in the community help create a talent pool.

**Risk management**

- | <b>Risk</b>   | <b>Mitigation Strategy</b>  |
|---|---|
| <b>Performance Risk of Environmental Outcomes</b>         | The Pay for Success model allows impact investors to shoulder some of the risk involved in an innovative solution such as green infrastructure. If the green infrastructure fails to meet performance goals, the investor will make a Risk Share Payment back to DC Water, allowing DC Water to recoup some of its investment. On the flip side, if projects overperform, DC Water will make a performance payment to investors, which they are willing to do because they will have learned these projects are significantly more effective than expected and this reduces the need for future green infrastructure capital investments. By structuring a payment contingent upon the effectiveness of green infrastructure, DC Water is focusing on outcomes (reducing stormwater runoff) in addition to outputs (whether the required number of impervious acres of GI is built). Hiring construction firms with experience and training will minimize its impact on performance risk. Defining the right goals and benefits of green infrastructure is a risk managed in consultation with DC’s Department of Energy and Environment and local experts, and training in green infrastructure. |
| <b>Performance Risk of Social and Governance Outcomes</b> | Transparency in the contractor selection and employee hiring process with established qualifications on local firms and with local employees. DC publishes its procurement, employment, and contracting processes on DCWater.com. Annual reporting on bonds as required by the Green Bond Principles is on what revenue is received and placed in projects that is independently audited.   |
| <b>Regulatory Risk</b>                                    | Regulation of the Water Act is at the Federal level and out of control of the DC Government. If changed, it could roll back the driving force for political will at the local level and limit the investors willing to invest, increase bond rates, and limit the affordability of the project. The project is already using pre-approved funding through   |

<b>Weather and Climate Change</b>	its completion, so future bond issuances for this project will not be affected by political will, but markets could look at environmental impact bonds differently if the regulatory driver is removed.  Severe weather could delay completion times. Construction firms familiar with the four seasons of local DC weather would help at the planning stages to estimate stages of completion. They have met all stages of completion at this time. Climate change risk can increase the frequency of intense storms and cause sea level rise. Climate resilience was integral to the project plan.
<b>Government Default Risk</b>	An investor risk. Risk-rated interest based on the seniority of the bond and the rating from agencies mitigates this risk with investors. Since lower seniority bonds would require higher rates, motivation remains to keep the bonds at senior debt for lower rates. This project has been guaranteed funding in advance until completion.

*iv. The investment model*

**The financial instruments being sought to fund the business model**  
**Environmental Impact Bond with Pay for Success**  
 Bond Type: Public Utility Subordinate Lien Revenue Bond Environmental Impact Bond.

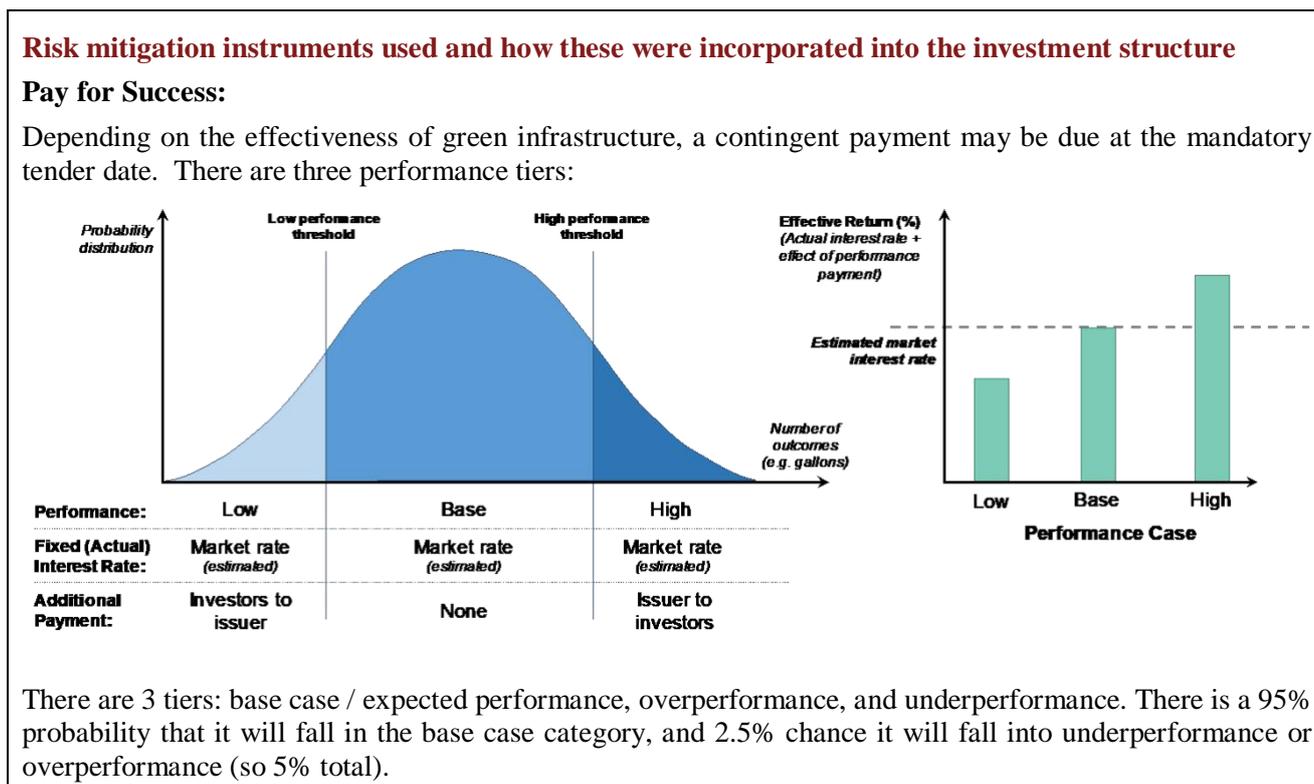
**The relative size of these instruments and basic information on their terms**  
 The term is 30 years with a mandatory tender after 5 years as detailed below:

	Year 1	Year 2	Year 3	Year 4	Year 5	
<b>Financial Flows</b>	<b>\$25M Principal Issued</b>				<b>\$25M Principal Repaid</b>	<b>If Green Infrastructure Overperforms:</b> Additional \$3.3M <b>Payment Performs as expected:</b> No Additional Payment. <b>Underperforms:</b> \$3.3M claw back from investors
		<b>Interest Payments at 3.43%</b>				
<b>Core Project Work by DC Water</b>	<b>Flow Meters Inserted to Create Baseline</b>	<b>Green Infrastructure Implemented (sites, identified, intervention Constructed)</b>		<b>Flow Meters Reinserted to Measure Impact</b>	<b>Evaluation Validated to Trigger Payments</b>	<b>If Green Infrastructure Overperforms :</b> Accelerate Scale/Deployment <b>Performs as expected:</b> Continue Original Plan with Confidence <b>Underperforms:</b> Scale Back and Deploy grey infrastructure instead

*Figure 2 Based on diagram from Quantified Ventures*

**Investor types and the finance they provide at different stages of project maturity**  
 The bond is subordinate debt. All debt was purchased by two impact investors: Goldman Sachs Urban Investment Group and Calvert Foundation (now Calvert Impact Capital).

<b>Senior Debt</b>	<ul style="list-style-type: none"> <li>• Institutional Investors</li> <li>• Commercial Banks</li> <li>• Microfinance Providers</li> </ul>
<b>Subordinate Debt</b>	<ul style="list-style-type: none"> <li>• Institutional Investors</li> <li>• Impact Investors</li> <li>• Development Institutions</li> </ul>
<b>Mezzanine Financing</b>	<ul style="list-style-type: none"> <li>• Impact Investors</li> <li>• Development Institutions</li> <li>• Donors</li> </ul>
<b>Equity</b>	<ul style="list-style-type: none"> <li>• Impact Investors</li> <li>• Development Institutions</li> <li>• Angel Investors</li> </ul>



**The exit strategy employed**

Because the bond is purchased in full in private placement by investors there is no exit option. There is a mandatory tender at 5 years. The relationship with investors ends once final payment is made and that payment will be based on the overall level of success. Conservation benefits will continue after investor exit.

**Innovative features of the investment model**

The pay-for-success is unique driver of outcomes by Quantified Ventures. “This new, highly-replicable financing mechanism allowed DC Water to shift the performance risk of their green infrastructure project to impact investors, thus enabling them to choose ‘innovation’ over ‘business as usual.’ As a result, DC Water will pay for outcomes versus paying for a project and hope the desired outcomes follow”<sup>vii</sup>.

### Replicability and scalability

This project is replicable throughout DC Water’s jurisdictions in Maryland and Virginia, as well as other municipal water systems within the Chesapeake Bay Watershed. Reaching beyond individual municipal water utilities, state level EIBs can be issued by Maryland and Virginia to join Washington D.C. in partnerships with NGOs such as the Chesapeake Bay Foundation and Potomac Conservancy to address storm water runoff on a landscape scale.

Further, as over 850 municipalities must address their combined sewer overflow (CSO) under the Clean Water Act of 2004, this could provide benefits nationwide. Green infrastructure shows value over new sewer systems and has positive externalities of preventing flooding that may become more prevalent with climate change. Municipal or state level EIBs for green infrastructure could ensure safe drinking water, as well as higher levels of seafood abundance throughout the United States or anywhere in the world with CSO problems.

Beyond the conservation need to address stormwater runoff and the application of green infrastructure, EIBs are useful for multiple project types, including coastal, wetland, and waterway protection and conservation. Worldwide application of the pay for success aspect of the bond could find new innovative ways to solve environmental problems throughout the world.

### Acknowledgements

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Many thanks to CPIC Green Infrastructure for Coastal Resilience and for CPIC Green Infrastructure for Watershed Management Working Group members and other reviewers for their valuable contributions, especially:

- Shannon Cunniff, Environmental Defense Fund
- Natalya Skiba, The Nature Conservancy
- George Taylor, U.S. Department of State
- Kaspar Baumann, Clarmondial
- Tanja Havemann, Clarmondial
- Dr. Christine Negra, Versant Vision LLC
- Torsten Thiele, Global Ocean Trust

<sup>i</sup> Potomac Conservancy. (2018). Pollution | State of the Nation’s River 2018 | Potomac Report Card. <http://potomacreportcard.org/pollution/>

<sup>ii</sup> DC Mayor’s Office. (2017). Mayor Bowser & DC Water Kick Off Green Infrastructure Project, 10/23/17. Washington, D.C.: YouTube. <https://www.youtube.com/watch?v=jsBJJ-BDoQ8&feature=youtu.be>

<sup>iii</sup> DC Water. (2018, March 22). FY 2017 Green Bond Annual Report (revised). DCWater.com. [https://www.dewater.com/sites/default/files/finance/FY%202017%20Green%20Bond%20Report\\_revised.pdf](https://www.dewater.com/sites/default/files/finance/FY%202017%20Green%20Bond%20Report_revised.pdf)

<sup>iv</sup> DC Water. (2018, March 22). FY 2017 Green Bond Annual Report (revised). DCWater.com. [https://www.dewater.com/sites/default/files/finance/FY%202017%20Green%20Bond%20Report\\_revised.pdf](https://www.dewater.com/sites/default/files/finance/FY%202017%20Green%20Bond%20Report_revised.pdf)

<sup>v</sup> DC Water. (2018, March 22). FY 2017 Green Bond Annual Report (revised). DCWater.com. [https://www.dewater.com/sites/default/files/finance/FY%202017%20Green%20Bond%20Report\\_revised.pdf](https://www.dewater.com/sites/default/files/finance/FY%202017%20Green%20Bond%20Report_revised.pdf)

<sup>vi</sup> Goldman Sachs, DC Water, & Calvert Foundation. (2018). FACT SHEET: DC Water Environmental Impact Bond. <http://www.goldmansachs.com/media-relations/press-releases/archived/2016/dc-water-environmental-impact-bond-fact-sheet.pdf>

<sup>vii</sup> Quantified Ventures. (2018). DC Water. <http://www.quantifiedventures.com/dc-water/>