



# DC Water's Environmental Impact Bond: A First of its Kind

U.S. EPA Water Infrastructure and Resiliency Finance Center  
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## Background

A third of Washington, DC is serviced by a combined sewer system. In 2005, EPA and the District of Columbia Water and Sewer Authority ("DC Water") entered into a Consent Decree ("CD") with a 20-year Long Term Control Plan ("LTCP") with an estimated \$2.6 billion in planned investments to reduce CSOs ("Combined Sewer Overflows"). In 2015, DC Water renegotiated its CD and LTCP to incorporate large-scale Green Infrastructure ("GI") installations to replace one of three deep tunnels that were part of the original LTCP. The new CD requires DC Water to manage stormwater runoff produced by 1.2" of rainfall on 365 impervious acres of land in the Rock Creek Sewershed and 133 impervious acres in the Potomac River Sewershed.

As part of its green infrastructure investment strategy, in September 2016, DC Water issued an Environmental Impact Bond ("EIB")<sup>1</sup> pursuant to the terms of a Private Placement Agreement ("PPA"). The EIB terms negotiated with Investors reflect key elements of the "Pay for Success" model used to pilot outcome-based initiatives in the social policy space. Pay for Success is a form of performance-based contracting between a public entity and the private sector where payment is based on measured outcomes. The DC Water EIB represents the first use of the Pay for Success model in the water space and the first to be issued as a tax-exempt municipal bond. DC Water's stated purpose for using this model was to isolate project performance risk associated with its initial investment in green infrastructure on public properties.

The Water Finance Center has reviewed the terms of this transaction as part of its mandate to identify and communicate the value of innovative financing practices. The DC Water EIB represents a new financial structure that could serve as a model for utilities throughout the water sector.

## Overview of the Transaction

### Financing Structure

The EIB is a 30-year tax-exempt municipal bond with a mandatory tender in year five. The bond issue was placed with two institutional investors, Goldman Sachs Urban Investment Group and Calvert Foundation (the "Investors"). The bonds were issued at a \$25 million face value and an initial 3.43% interest coupon, payable semiannually, for the first five years. The stated maturity date is October 1, 2046. The mandatory tender date is April 1, 2021.

DC Water's EIB payment obligation is subordinate to its obligation on its publicly issued bonds. This means that on regularly scheduled interest payment dates as well as the mandatory tender date, the EIB payment obligation can only be met if DC Water has provided for full scheduled payments on the outstanding senior obligations.

At the five-year mandatory tender, there is provision for a \$3.3 million payment, payable to Investors by DC Water or to DC Water by Investors, contingent on the relative success or failure of the project. If the GI produces stormwater runoff reductions

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<sup>1</sup> EIBs are modeled on Social Impact Bonds ("SIBs") which represent an innovative finance mechanism that seeks to mobilize private capital investors to supplement public investment dollars. In the social impact bond model, the private sector works with governments and philanthropies to fund critical prevention-focused social programs that help address prison recidivism, homelessness, early childhood education etc. In this public-private partnership, investors are only repaid if and when improved social outcomes are achieved. This idea is the core of the Pay for Success delivery model. See: [Rockefeller Foundation Initiative](http://www.rockefellerfoundation.org/our-work/initiatives/social-impact-bonds) (www.rockefellerfoundation.org/our-work/initiatives/social-impact-bonds).

greater than 41.3% of the measured baseline, DC Water will make a one-time additional Outcome Payment to Investors of \$3.3 million. If runoff is reduced less than 18.6% of the measured baseline, Investors will make a one-time Risk Share Payment to DC Water of \$3.3 million. A performance measurement of between 18.6% and 41.3% reduction in runoff will result in no additional payment other than the basic principal and interest payable on the EIB.

### **Performance Measurement and Contingent Payments**

DC Water is obligated by the terms of the PPA to monitor project performance for a 12-month period following project completion. This period must begin within 3 months of project completion. The PPA requires DC Water to deliver a Final Report within 180 days of the conclusion of the monitoring period. The report will verify the effectiveness of GI for the purpose of determining Investor/DC Water payment obligations. Before a Risk Share or Outcome Payment can be made, the opinion of an independent third party (the "Independent Validator"), selected by the transaction parties, must be provided that confirms the report's findings. The opinion is due within the 45 days of report delivery (failure to deliver does not affect obligations of the parties).

The performance outcome will determine whether Investors will be required to make the Risk Share Payment, receive the Outcome Payment or simply tender their bonds. The PPA establishes the terms by which each of these contingencies are managed. Should the performance measurement require the \$3.3 million Risk Share Payment to be made by Investors, DC Water will withhold that amount from the principal and interest it would otherwise be obligated to pay the Investors on the mandatory tender date. This would reduce the interest and/or the principal payable from system revenues to EIB investors on the mandatory tender date by \$3.3 million. By establishing a prior legal claim to these revenues as the source of the potential Risk Share Payment, DC Water eliminates Investor counterparty risk. In other words, DC Water would not have to look to the Investors to deliver timely payment which, at the time, could be jeopardized by an insolvency or a legal dispute. Should performance measurement require an Outcome Payment be made to Investors, DC Water's obligation to make such payment is limited to available net revenues of the DC Water system *after* providing in full for payments due on outstanding senior and subordinated debt obligations. If performance measurement establishes that a Risk Share or Outcome Payment is not required, Investors will realize a total annualized return over the five-year period equal to the face amount of the 3.43% coupon.

The most significant feature of this project is the creative way in which performance outcomes are linked to the financing. The project's financial structure provides Investors with a financial premium/bonus if the project outperforms, and it provides DC Water with an equivalent financial risk share payment if the project underperforms relative to expectations. The EIB financial structure makes it possible for DC Water to test and implement GI while the Risk Share Payment provides DC Water with a financial hedge against under performance - and the financial means to mitigate it.

### **The Establishment of Baseline Measurement Standards**

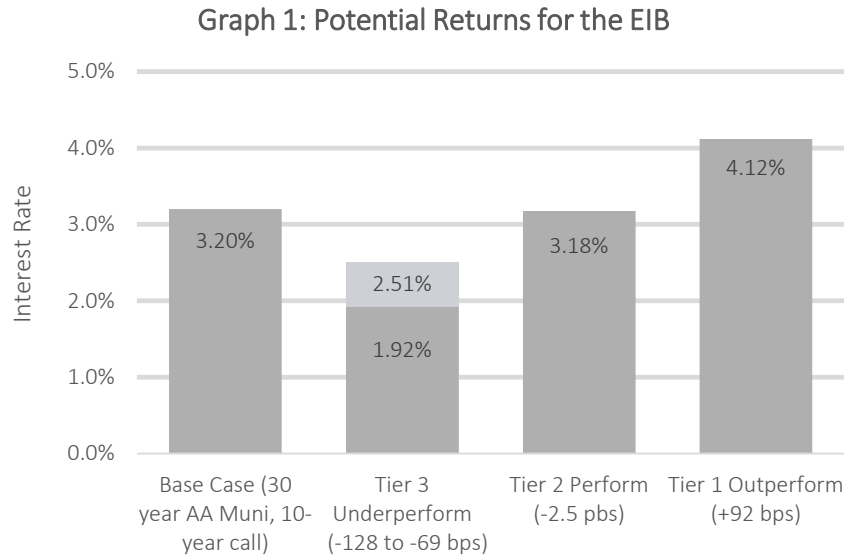
#### *Financial Metrics*

Our initial analysis examined the alternative Internal Rates of Return (i.e., the comparative costs to DC Water) of the EIB against each of the potential outcomes described above. We then compared these cash flows to the equivalent cash flow of issuing a double-A tax-exempt 30-year bond in the public municipal market with an average life of 28.5 years.

We assumed semi-annual interest with principal payments that mirror the four equal bullet payments in years 2043 - 2046 (\$6.25 million per year). We also assumed that after the initial five-year period, DC Water refinances at the current 25-year forward rate (3.057%), based on semi-annual interest and the four bullet principal payments discussed above, for the remaining term of the bond.

DC Water has full discretion as to how to apply the potential Risk Share Payment. Although, Investors would not be paid \$3.3 million from withholding the last \$425,135 interest payment and \$2,874,865 in principal due, DC Water could potentially use that amount to remediate the performance failure. The financial impact on DC Water would amount to a range of outcomes

that would result in the bond remarketing amount varying from the full \$25,000,000 to the minimum of \$22,125,135. The minimum redemption amount assumes that DC Water pockets the Risk Share Payment without remediating the project. Regardless, Investors would receive only \$22,125,135 in bond principal (\$25 million less the net principal reduction of \$2,874,865).



Graph 1 represents the potential returns for the EIB based on modeling. These results indicate that DC Water recovers anywhere from 132 to 60 basis points<sup>2</sup> (“bps”) in annual interest costs if the project underperforms expectations. If project performance meets expectations, DC Water saves approximately 2.5 basis points, which reflects the difference between the current market rate and the current forward rate. If the project outperforms, DC Water would pay approximately 92 basis points over the base case. In dollar terms, these outcomes range from a savings of as much \$4.35 million for an underperform scenario, saved interest and cost of \$338,374 over the 30-year term if the project performs as expected, and an Outcome Payment of \$3.30 million<sup>3</sup> if project expectations exceed 41.3% volume reduction. It is important to note the following when considering these findings:

- They are based on a fixed rate for the final 25-year period at the forward rate (the multi-modal financing structure allows DC Water to reset interest rate periods to minimize the future impact of rates on interest costs relative to the base case);
- These values are indicative *only* as they are based on a number of assumptions regarding future market conditions;
- The total dollar amounts saved or owed are therefore not comparable to present value dollars and;
- The single term bond payable in 30 years is maximally sized for investor appeal when the bonds are remarketed in year five. Although this introduces some inefficiency relative to a traditional level debt service structure, future bond issuance by DC Water will provide plenty of opportunity to balance its overall debt structure.

If only the first five years of the transaction are examined, the expected cost is the 3.43% coupon, the underperform scenario would cost 0.81% and the over-perform scenario would cost 5.801%. However, this would need to be compared to the 5-year AA Muni rate of 0.98% without accounting for the remaining 25-year financing risk.

<sup>2</sup> A basis point is one-one hundredth (1/100) of a percentage point.

<sup>3</sup> If capitalized, the additional interest cost would be \$50,639 per year or an additional \$2.146 million total over 25 years.

### *Stormwater Volume Metrics*

DC Water established project metrics using a combination of historic rainfall and sewer data along with the green infrastructure design plan. DC Water used rainfall data recorded over the three-year period of 1988-90 to establish baseline climate conditions. This data is aligned with 60-year rainfall averages and is the same data used in the modeling for the CD to establish baseline climate conditions. In addition, DC Water conducted 12 months of rainfall and sewer flow monitoring of the specific area chosen for the first green infrastructure project. This data allows DC Water to estimate the current amount of stormwater runoff in the area slated for GI. With this data and the green infrastructure design plan, DC Water estimated the expected performance of GI. Investors are confident that the volumetric model was properly validated and calibrated.

### **Transaction Specific Risk Allocations**

The matrix below provides a breakdown of the risk allocations among the parties:

RISK CATEGORY	RISK ALLOCATION <sup>4</sup>	DESCRIPTION
Performance of Green Infrastructure	Goldman/Calvert	DC Water has effectively hedged performance risk. The Risk Share and Outcome Payments offset the project underperforming or exceeding expectations, respectively. The Risk Share Payment provides DC Water with additional resources to address performance deficiencies should project performance fall short of expectations. Because the Outcome Payment reflects outperformance, the additional payout has a positive cost benefit.
Market/Financing Risk	DC Water	DC Water retains the financing risk with the multi-modal financial structure. The scheduled reset in year five subjects DC Water to market conditions when the rate is reset. The multi-modal structure also hedges risk that the reset rate will be higher than the initial rate as DC Water determines future reset periods.
Counterparty Risk	Goldman/Calvert	Offsets against principal and interest due on Mandatory Tender Date (MTD) assure payment of the potential Risk Share Payment and eliminates any counterparty risk that DC Water would otherwise have with respect to the Investors.  For GS/Calvert the Outcome Payment is payable from Net System Revenues after all principal and interest payments due on senior and subordinated debts are paid. Investors take an extra degree of counterparty risk on DC Water for this payment given the additional subordination.
Construction Risk <sup>5</sup>	DC Water	DC Water retains responsibility for designing, constructing and maintaining the project assets. GS/Calvert brought in experts to review the plan before agreeing to invest and do not make or receive any outcome or risk share payment until the project is completed thereby eliminating construction risk to the Investors.
Regulatory Risk	DC Water	Any changes in laws, rules, regulations, policy or guidance will be the responsibility of DC Water. GS/Calvert only need comply with standard private placement rules.
O&M and CapEx/Lifecycle Risk	DC Water	DC Water is responsible for Operating and Maintenance (O&M) for the life of the transaction.

<sup>4</sup> Risk allocation between DC Water & GS/Calvert

<sup>5</sup> Cost overruns, delays, force majeure, labor disputes, environmental risk, ground conditions

## Conclusions & Takeaways

DC Water's use of an EIB structure to hedge performance risk on its initial build-out of GI represents the first time an EIB has been issued. The EIB structure adopted by DC Water incorporates key elements of a Pay for Success contract structure. Pay for Success contracts reward investors for performance, defined by a measurable metric, with a pre-negotiated rate of return plus return of principal. In a traditional Pay for Success contract, performance failure may result in no return on investment, including a total loss of principal (i.e., performance risk to the investor of up to 100%). DC Water designed its EIB to share performance risk between itself and investors by reducing DC Water's cost of capital (the interest paid to investors) in the event of flow reduction underperformance and increasing DC Water's cost of capital (the return to investors) in the event of over-performing flow reduction.

As discussed above, the relative financial performance of DC Water's EIB versus a traditional level debt service financing structure reflects:

- The decision to establish financing terms that are directly tied to GI project performance;
- The need to bi-furcate the financing structure to collar the initial period after which payments tied to project performance will apply and to provide for timely payment thereof;
- The trade-off between the rate certainty of most traditional financing structures and the rate uncertainty tied to the mandatory tender and the remarketing that must occur after the initial period that the EIB terms must be in place; and
- The use of one term bond which sacrifices level debt service in favor of maximizing investor appeal. The level debt service can be remedied as future debt terms are positioned around the term bond.

As the first of its kind, the DC Water EIB has yet to be repeated and thus, there is no evidence this financing mechanism is transferable. This synopsis is intended to assist local government decision-makers as they consider this approach to secure investor capital for green infrastructure or other needs. A key question that decision-makers face is whether the benefits of an EIB eclipse the value proposition of traditional funding approaches? Capturing the technical knowledge from this first transaction is a necessary step toward answering this question.

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## U.S. EPA Water Infrastructure and Resiliency Finance Center

The Water Finance Center is an information and assistance center, helping communities make informed decisions for drinking water, wastewater, and stormwater infrastructure to protect human health and the environment. Through its technical assistance to states, local government and non-governmental entities the Water Finance Center helps communities understand their financing options, improving the effectiveness of federal funding, and supporting local decision-making for resilient water infrastructure.

If you have any questions, please contact the Water Finance Center at:

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