Submitted to:

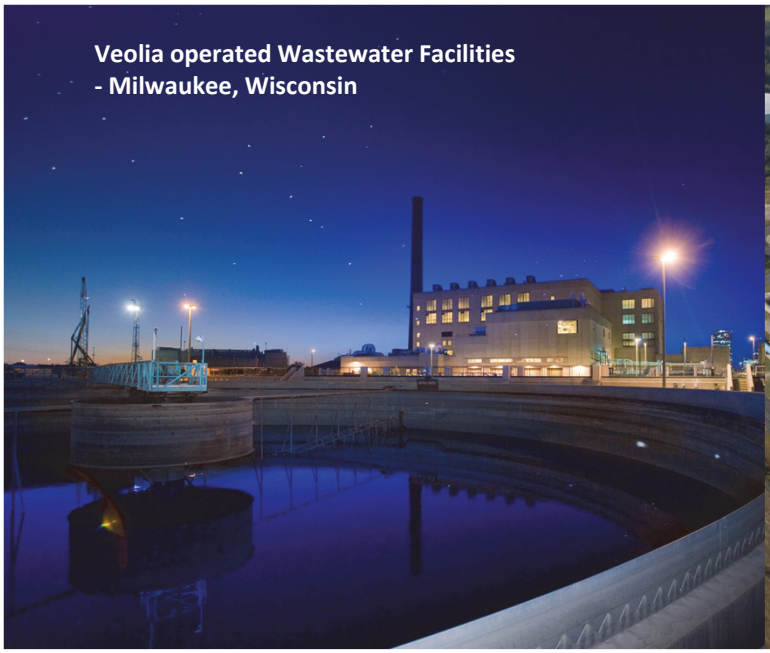
JEA

Response Submittal

ITN #127-19
Invitation to Negotiate for Strategic Alternatives

October 7, 2019

VEOLIA



VEOLIA

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ITN #127-19
Invitation to Negotiate for Strategic Alternatives

October 7, 2019

Contact Information: **Veolia North America, Inc./Water North America - South, LLC**
Mr. Steven Kruger, Senior Vice President
14055 Riveredge Drive Suite 240, Tampa, Florida 33637
Telephone: 813/983-2806 – Email: steven.kruger@veolia.com

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(Submitted as an executed original and five copies and six electronic copies, PDF, on Data Sticks.)

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TAB 1

Cover Letter

October 7, 2019

JEA Procurement Bid Office
21 West Church Street
Customer Center - 1st Floor, Room 202
Jacksonville, Florida 32202
Attention: Jenny McCollum, Procurement Representative

Subject: **Response Submittal - ITN #127-19**
Invitation to Negotiate for Strategic Alternatives
Section 1: Cover Letter on the Respondent's Letterhead

Dear Ms. Jenny McCollum:

In response to your Invitation to Negotiate for Strategic Alternatives, Veolia is pleased to provide this Response Submittal to your request that demonstrates the value our company can bring.

Veolia is offering to provide operation, maintenance and management (O&M) services for your agency's water and wastewater systems. These services would include your water wells, water treatment and distribution systems, customer service, as well as wastewater collection, treatment and effluent reuse operations. Veolia can also oversee capital planning, capital program management and construction.

Veolia has considerable experience managing similar-sized utilities in the U.S. and across the globe and offers flexibility in our delivery models and contract formats in any of the Strategic Alternatives being considered. Our response supports the Invitation's goals through efficient OM&M which supports the utility valuation, rate stability and new debt expense; effective capital project services to minimize future investments and rate impacts; assures a level of service the same as or better than current; and offers experience in successful employee transition.

Veolia's proposed approach, as allowed under the Addenda to your Information to Negotiate (ITN) request (Addendum 1), would allow the JEA to achieve your stated goals with Veolia working in combination with your agency and any other potential partners that the JEA, and/or Veolia, would retain under this comprehensive initiative.

Veolia is a global company that recognized revenues of over $30.1 billion in revenue in 2018. With more than 171,000 employees, Veolia has an established base of expertise, experience and resources. Our company's work in Florida covers more than three decades, and has involved innovative design/build/operate (DBO) and engineer-procure-construction management (EPCM) type approaches, as well as long-term operations, maintenance and management (O&M) types of agreements. Veolia's ongoing partnership with **Tampa Bay Water**, an agency that supplies wholesale drinking water to 2.5 million people in Hillsborough County, Pasco County, Pinellas County, New Port Richey and St. Petersburg. We began that partnership in 2000 under a DBO contract for their then-new surface water treatment plant. Under this initial agreement, we generated savings of over $85 million, and that plant was subsequently expanded to its current capacity of 120-MGD under a second DBO agreement.

In North America, our consolidated businesses generated over $2.6 billion in revenue in 2018. Under long-term partnerships our company now has operations and management responsibility for 210 municipal wastewater plants able to treat over 1.7 billion gallons of flow each day to meet the needs of 5.4 million people, along with 89 municipal water treatment plants that can supply potable water to over 4.7 million people.

Veolia's work experience also has included long-term O&M agreements for large water and wastewater systems with needs and challenges similar to those that your community now faces. Two examples of that experience include:

- **Milwaukee, Wisconsin** – Under an ongoing 20-year agreement, Veolia has O&M responsibility for the wastewater and stormwater management systems that serve more than 1 million people in 28 communities. This system includes two large treatment plants (300-MGD and 320-MGD) an extensive collection and stormwater management system, and a landfill gas and energy generation operation that is used to meet part of the electrical load for the wastewater plants. Veolia's work with Milwaukee has been recognized with numerous awards, including the first-ever U.S. Water Prize in 2011 from the Clean Water America Alliance for O&M excellence in "green" initiatives to address greenhouse gas (GhG) reduction and achieve a high level of environmental sustainability using a resource-recovery approach.

- **City of Indianapolis, Indiana** - Veolia managed this regional water system serving almost 1 million people. That system, comprised of four surface water treatment plants (16-MGD to 96-MGD), five groundwater treatment plants (2-MGD to 24-MGD) and a 4,300-mile distribution system, had multiple water pressure zones (15 districts and five sub-districts). Veolia initiated a new standard for water utility operations and service excellence at Indianapolis, completing the rigorous program for ISO 9001 and 14001 standards. This made Indianapolis the only major city in the U.S. that had achieved these standards for its water operations, and Veolia Water Indianapolis the first U.S. water company to be simultaneously certified in both.

An international company, Veolia designs and provides water, waste and energy management solutions that contribute to the sustainable development of communities and industries. Through its three complementary business activities, Veolia helps to develop access to resources, preserve available resources, and to replenish them. This work involves supplying over 95 million people with drinking water and more than 63 million people with wastewater service, delivering energy service (producing nearly 56 million megawatt hours of energy) and waste management (converting over 49 million metric tons of waste into new materials and energy).

The work of Veolia's global group covers the operation and management of some of the largest water and wastewater systems in the world, including:

- **Paris, France** - On behalf of the Ile de France Water Authority (SEDIF), the largest water authority in France, Veolia manages the drinking water supply for communities in Paris suburbs, supplying more than 4.5 million inhabitants and over 584,000 connections. This partnership began in 1962 and is ongoing through 2022. The system includes three water treatment plants, with a total capacity of more than 406-MGD, 48 secondary pumping stations, 69 water tanks and over 5,395 miles of water lines.
- **Shenzhen, Guangdong Province, China** – Under a 50-year concession agreement, Veolia has operations and management responsibility for a water and wastewater system that serve more than 3.5 million people. This project represents Veolia's largest project in China and includes 13 water treatment plants 1,657 miles of water lines and 489,990 water meters, along with six wastewater treatment plants and 2,135 miles of sewer line. Through the partnership, Veolia has contributed major breakthroughs for the special economic zone in terms of water quality, technical upgrade, network extension and management, enhanced customer services as well as positive environmental impact.

With this base of experience and resources, Veolia brings a local presence and broad-ranging resources to work with you in this new initiative, all backed by the largest environmental services company in the world.

Perhaps the best way for the JEA to assess our value-added proposals is for you to visit some of the reference projects that we profile in this submittal to see first-hand how the innovations have been implemented and the benefits they provide.

We would be happy to have team members from JEA visit our project/operations sites, and we believe that there would be significant benefit for you in doing so.

In the remainder of this Transmittal Letter we address the requirements of Section 1: Cover Letter of this Response Submittal:

1. Contact information:

Veolia is the Respondent and our firm's points of contact for the purpose of this Invitation to Negotiate going forward will be:

Mr. Rob Nicholas, Vice President - Development - Major Projects Group,
Veolia North America/Veolia Water North America – South , LLC
14055 Riveredge Drive, Suite 240, Tampa, Florida 33637
Telephone: (859) 582-0104 - Email: robert.nicholas@veolia.com

2. Name and signature of the representative of the responding organization authorized to legally obligate the Respondent:

Veolia is the Respondent and I will serve as our company's authorized representative for the purposes of this ITN submittal, and my contact information is as follows:

Steven J. Kruger, Senior Vice President
Veolia Water North America – South, LLC
14055 Riveredge Drive Suite 240, Tampa, Florida 33637
Telephone: 813/983-2806 – Email: steven.kruger@veolia.com

3. Legal name of company and headquarters location of the Respondent:

- Veolia in North America is the largest water and wastewater company in North America, and the legal name for the company is **Veolia Water North America Operating Services, LLC**. Our North American headquarters office is located at: 53 State Street, 14th Floor, Boston, Massachusetts 02109.
- Veolia operates through a regional company in Florida, **Veolia Water North America – South, LLC**. Our regional headquarters office is located at: 14055 Riveredge Drive, Suite 240, Tampa, Florida 33637
- Veolia's operations in North America are part of a global group, Veolia Environnement, S.A.; **Veolia North America, Inc.** is the legal and financial holding company of Veolia Environnement's principal businesses in the U.S. and has its headquarters office at: 53 State Street, 14th Floor, Boston, Massachusetts 02109.

4. Location and date of incorporation or organization (as applicable) and type of business:

- **Veolia Water North America Operating Services, LLC** is a limited liability company (LLC) that was established in 1986 under the laws of the State of Delaware and is an authorized LLC in the State of Florida.
- **Veolia Water North America – South, LLC** was established as a separate LLC company in 2004, and is an authorized LLC in the State of Florida.
- **Veolia North America, Inc.** is a corporation under the laws of the State of Delaware, established 2017.
- **Veolia Environnement, S.A.** is a French limited company and is publicly traded company in France. The company was first established in 1853 as Compagnie Générale des Eaux.

5. Federal Employer Identification Number (EIN):

- The Federal EIN for Veolia Water North America Operating Services, LLC is: 93-0929498.
- The Federal EIN for Veolia Water North America – South, LLC is: 68-0597431.

Veolia has also prepared and provided as Attachments at the end of this letter the required Attachment, including: Attachment 1 – Respondent's Certification and Attachment 2 – No Conflict of Interest Certificate.

As the Principal of Veolia's operations in the State of Florida, I will work to ensure our firm's commitment to JEA as your procurement process moves forward. I invite you to contact Mr. Nicholas should you have any questions with regard to this submittal, and we very much look forward to your review of this submittal and to the next steps in your procurement process.

Sincerely Yours,

Steven J. Kruger
Senior Vice President
Veolia Water North America – South, LLC

Attachments:
- Certificate of Secretary (signature authority)
- Attachment 1 – Respondent's Certification (Response Form)
- Attachment 2 – No Conflict of Interest Certificate

CERTIFICATE OF ASSISTANT SECRETARY

OF

VEOLIA WATER NORTH AMERICA-SOUTH, LLC

The undersigned, Whitney Fawcett, Assistant Secretary of Veolia Water North America-South, LLC, a Delaware limited liability company (the "Company"), does hereby certify that Steven Kruger is the duly elected and acting Senior Vice President of the Company and in such capacity is authorized to execute contracts and make commitments with regard to the following project:

ITN #127-19
INVITATION TO NEGOTIATE FOR STRATEGIC ALTERNATIVES
JACKSONVILLE ELECTRIC AUTHORITY (JEA)
CITY OF JACKSONVILLE, FLORIDA

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Company this 1st day of October, 2019.

Whitney Fawcett, Assistant Secretary

SEAL

127-19 APPENDIX A – RESPONSE FORM

Company Name: Veolia Water Norfth America - South, LLC

Company's Address 14055 Riveredge Drive, Suite 240, Tampa, Florida 33637

Phone Number: 813/983-2806 FAX No: 813/983-2821 Email Address: steven.kruger@veolia.com

☒ **I have read and understood the Sunshine Law/Public Records clauses contained within this solicitation. I understand that in the absence of a redacted copy my proposal will be disclosed to the public "as-is".**

NOTE: This is not a Proposal, and is being submitted to the JEA in response to ITN-127-19 Strategic Alternatives.

RESPONDENT CERTIFICATION

By submitting this Response, the Respondent certifies that it has read and reviewed all of the documents pertaining to this Solicitation, that the person signing below is an authorized representative of the Respondent Company, that the Company is legally authorized to do business in the State of Florida, and that the Company maintains in active status an appropriate contractor's license for the work (if applicable). The Respondent also certifies that it complies with all sections (including but not limited to Conflict of Interest) of this Solicitation.

We have received addenda 1 through 4

Handwritten Signature of Authorized Officer of Company or Agent

October 7, 2019
Date

Steven J. Kruger, Senior Vice President
Printed Name and Title

CONFLICT OF INTEREST
CERTIFICATE

JEA IFB No. ITN #127-19

Bidder must execute this form, if applicable, relative to Florida Statute 112.313. Failure to submit this form, if applicable, shall result in rejection of this bid.

I hereby certify that the following named JEA official(s) and employee(s) having material financial interest(s) (in excess of 5%) in this company have filed Conflict of Interest statements with the Supervisor of Elections, 105 East Monroe Street, Jacksonville, Duval County, Florida, prior to bid opening.

Name	Title or Position	Date of Filing
Not Applicable - To the extent of Veolia to determine such, no JEA officials or emloyees have material financial interests in our company.		

Signature

Veolia Water North America - South, LLC
Company Name

Steven J. Kruger, Senior Vice President
Name of Certifying Official
(type or print)

14055 Riveredge Drive, Suite 240
Business Address

Tampa, Florida 33637
City, State, Zip Code

TAB 2

Executive Summary

Veolia - Milwaukee, WI

O&M Partnership

Tab Two:

Executive Summary

Project Understanding & Commitment

Through this Invitation to Negotiate (ITN), JEA is seeking strategic flexibility to adopt a once in a generation transformation to achieve its vision to improve the lives of its citizens in Northeast Florida.

Veolia is proposing a solution that will assist in maximizing Customer, Community, Environment and Finance value for citizens by building on JEA's strengths while taking advantage our ability to innovate without the constraints JEA currently faces.

In this Executive Summary section, we provide a narrative discussion of our proposed approach to meeting the core water and wastewater utility requirements outlined in your Invitation to Negotiate (ITN), including the structure that we are initially proposing, the advantages that Veolia offers through our global network of expertise, experience and resources, the benefits that we can offer JEA and the City of Jacksonville including consumer benefits, as well as key aspects of implementation for JEA to consider.

Structure and Project Approach

The combination of electric, cooling, water and wastewater makes JEA an attractive utility for investors and utilities. But that broad spectrum of operations and the alternatives being considered by JEA means the final decision on ownership and operations may be unique.

Efficient and effective management of water and sewer is valuable to whatever Strategic Alternative is selected.

Veolia is therefore offering to provide operations, maintenance and management (O&M) services for the JEA's water and wastewater systems. This is an area in which our firm offers a tremendous amount of value to JEA through our experience in managing similar-sized utilities in the U.S., North America and across the globe.

Under this type of an approach, we can be flexible in our delivery models to offer value in any of the Strategic Alternatives being considered. Our company can also oversee, as part of this service approach, capital planning and construction. Or, we can offer any part of those services in a wide range of contract formats.

Advantage of Veolia's Approach

Veolia can assist JEA in achieving its objective to increase not only the water and wastewater system value but the value of the entire JEA assets now and into the future.

Our approach in this area would involve:

1. **Positioning JEA to Succeed** - Veolia is a company specializing in water and wastewater. Our efforts are based not only on responding to trends in the industry but in creating them. We have invested in a large water research center focused on responding to and developing trends in water treatment, delivery and management. That resource provides a deeper opportunity for the City of Jacksonville to accelerate the change needed at JEA and address trends occurring in the industry. For example, our research created ballasted floc in our ACTIFLO® water treatment equipment which was used at Tampa Bay Water, offering saving to that client of more than $85 million in terms of the life cycle cost of their facility.
2. **Proactively Shape Talent and Culture** - The change of employment to a market-based company immediately alters the perspective of employees seeing the opportunity to grow within a large water organization. Additionally, a large number of current staff will be retiring. This is a risk to the utility in loss of knowledge but also an opportunity to pivot the organization to meet the acceleration of technology reshaping the water and wastewater sector. Veolia has helped our large O&M clients, such as at the Milwaukee, Wisconsin, wastewater operations, with a similar evolution of personnel.
3. **Driving Growth in Value** - Veolia brings an economy-of-scale to an operation, regardless of the ownership model, and with that comes an entrepreneurial spirit to better use the assets owned by JEA to expand its revenue, reach and impact. These include using technical innovations to expand the use of municipal assets into bioenergy at the wastewater operations in Milwaukee, Wisconsin and at our merchant biosolids operations at Cranston, Rhode Island, as well as the delivery of additional services, such as customer billing, at our water and wastewater operations in New London, Connecticut. We can also assist JEA in protecting your water and wastewater assets. Our Resiliency Study and assistance to the communities of Milwaukee and New Orleans, Louisiana, have worked to identify the risks to water and wastewater utilities with recommended actions to harden these systems to better withstand storms and to recover more quickly afterwards. (Tab 7 includes copies of the resiliency studies for these two clients.)
4. **Identifying and Enabling Growth in Investments** – Veolia, through our global research and development (R&D) group has created tools such as the Veolia Innovation Accelerator to test, invest and grow new technology and practices. This experience can be used in JEA to explore the latest trends in the industry for the benefit of the utility.
5. **Maintaining Affordability and Reliability for Customers** - Veolia controls water and wastewater costs to help manage the affordability of service through a variety of management models. This has been demonstrated in Veolia's work with clients such as the City of Indianapolis, Indiana, where our work resulted in a three-year rate freeze. We have also made investments in new technologies to help reduce staffing demands and improve service delivery.

As you review our submittal that is presented in the other sections that follow in this volume, we trust that JEA will be interested in engaging in further discussions with Veolia across the range of options and possibilities that we have proposed. Through this type of a collaborative approach we would be able to initiate the full due diligence that we would need to complete, so that we can target very specifically where to focus our attention to bring maximum value. We are hopeful to have this opportunity and are willing to commit considerable effort and resources to it.

The Impacts of Our Approach

Veolia can bring changes to JEA's utility operations, which can benefit the customers, employees and community, including:

- **Reasonable Rates** - Veolia is proud of the O&M savings we have delivered for large utilities like Tampa Bay Water, Milwaukee, New Orleans, Chicago, New York City and DC Water (Washington, DC). Those

savings included immediate changes for the utility and a strong cost-control component over the years. At Indianapolis Water, we provided a three-year rate freeze for customers initially, and that control and reduction of cost had long-term savings. At Downriver Utility Wastewater Authority in Michigan, the savings we generated enabled the 13 member communities to purchase the wastewater assets from Wayne County and thereby control their own destiny.

- **Customer Services and Relationship** - Veolia pioneered KPI-based pay in O&M contracts in the U.S. that included re-engineering customer service at Buffalo to speed up call answering, improve performance and increase field-visit timeliness. The use of metrics by Veolia supported innovative communications with customers, customer surveys, advisory groups and community participation. All of this was designed to provide an open and transparent utility to the community and employees.
- **Strong Financial Performance** - As the O&M provider, lowering costs and controlling them over the long term is value we bring to customers. The success of Veolia's O&M business demonstrates that value, as the largest O&M service provider for water and wastewater in North America with multiple contracts repeatedly renewed to extend our tenures of 10, 20, 30 and even 40 years.
- **Driving Growth** - Veolia has developed innovative business expansion approaches with its customers: a merchant biosolids facility in New England to increase revenue, the use of biogas for energy to cut costs in Milwaukee, combining storm and sanitary sewer services to expand the use personnel are just some of the ways we have expanded utilities. These are alternatives to the traditional utility and attuned to the vision of a Utility of the Future.
- **Economic Development & Driving Employment** - A focus on local business development in Milwaukee and New Orleans, as well as in multiple water and wastewater operations in Fulton County, Georgia, are examples of how Veolia drives economic development in our communities. This assures the spending of dollars to benefit the community through higher employment in these businesses.
- **Contribute to the City** - Our approach is to control cost for the water and sewer system. The resulting savings can be used by the owner of the systems to contribute to the City through a downtown office building, annual payments or other arrangement.
- **Compliance with Regulations and Environmental Stewardship** - Veolia is proud of its compliance record with numerous awards for plant operations like the 90-MGD Atlanta/Fulton County Water Plant. Our efforts in customer service and community involvement include working with the community on projects for environmental awareness. An example is the open house in Milwaukee at the 300-MGD Jones Island wastewater treatment plant.
- **Sustainability Program** - Veolia is committed to a sustainable environment. Our internal efforts to reduce waste include our in-house energy consulting group which focuses on conversation, alternative energy and energy-savings programs.

Customer, Community, Environmental and Financial

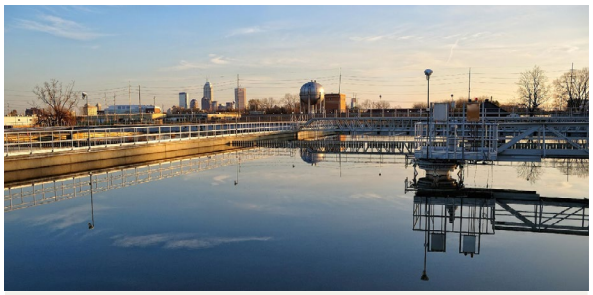
Veolia is committed to meeting the goals set by JEA. In response to the ITN, JEA will likely find respondents interested in utility acquisition, concession or investors without operations. Respondents are likely to have significant energy O&M experience but not comparable water and wastewater experience.

Our role will be to provide the O&M of the water and wastewater for an investor or company that ultimately controls the utility regardless of which strategic option is selected. Examples of the types of benefits that Veolia can offer include:

- **$3 billion or Greater Value** - Veolia as the O&M provider for water and wastewater would increase the value of a financial transaction through optimized operations and controlling cost. The acquisition will potentially bring increased interest costs as: a) municipal debt is exchanged for higher rate non-

municipal debt return on equity, and b) debt and equity amounts increase. The core value of the present utility will be optimized by delivering the same or better level of service at a lower O&M cost. These savings allow for greater acquisition price, can contribute to supporting the debt, or both. Veolia delivers this core competency across our range of customers which are described in the Veolia Capabilities and Results and Advantage sections below. We would seek partners from respondents where our skills will increase the financial offer. Further, Veolia will include exploiting opportunities to expand the service territory or services offered in water and sewer potentially creating further value. Successful participation in acquisitions such as: Franklin, Ohio (ownership and management of a regional wastewater treatment facility); concessions like Rialto, California (water and wastewater systems), or Cranston, RI (wastewater treatment and merchant biosolids facility); and other teaming relationships demonstrate our ability to provide that value.

- **Commitment to $350 for Water, Sewer and Reuse** – As the water and wastewater operator, Veolia's innovation, optimized organization, industry-leading best practices and cutting-edge technology will all play a supporting role to a Financial Partner's lead in this commitment by reducing and controlling operating costs as part of a larger transaction.
- **Thee-Year Rate Stability** - Veolia has provided this type of guarantee before under a contract with the City of Indianapolis, Indiana, which provided service to 350,000 water customers; as profiled (opposite). That was done through implementing changes to help reduce and control costs moving forward. Near-term rate stabilization without O&M reductions can bring greater future rate impacts since current revenue is not adequate to recover operating expenses and new debt and equity service. Shortfalls in rate recovery would require further short-term borrowing expense. Investors will ultimately seek recovery and return on all these costs. Maximizing asset value with near-term rate control and minimal future rate increase requires efficient O&M and ideally reductions from present costs.
- **Renewable Energy** – Veolia would support this objective as it relates to the water and wastewater facilities and is actively engaged in using biogas, landfill gas, solar and wind to produce energy at the facilities we operate. Our in-house, energy-efficiency experts focus their efforts on detailed tracking of energy usage and minimizing the use of energy through management, conservation and efficiency improvements. At the Milwaukee wastewater operations, Veolia combined digester gas and landfill gas to generate 100% of the power needs for a 300-MGD wastewater plant.
- **40-MGD of Alternative Water Capacity** - Veolia will explore and develop the most practical alternative for source water whether conservation, reuse, surface water, seawater or stormwater. This will include continuing the pilot programs already started for exploring those options.



For almost a decade Veolia managed an innovative water operations partnership with the **City of Indianapolis, Indiana**; delivering a transition approach that changed the management and operation of the City's water department. Veolia's management team achieved significant cost savings resulting in a 3 year rate freeze, organizational and operational improvements, technological advancements and management efficiencies. The Indianapolis water system is comprised of four surface water treatment plants (16-MGD to 96-MGD), five groundwater treatment plants (2-MGD to 24-MGD), a 4,300-mile distribution system, 29 water pump stations and multiple surface reservoirs and storage tanks. The Indianapolis water supply system also has multiple water pressure zones, with 15 districts and five sub-districts.

Veolia also initiated a new standard for water utility operations and service excellence at Indianapolis, completing the rigorous program for ISO 9001 and 14001 standards. This made Indianapolis the only major city in the U.S. that had achieved these standards for its water operations, and Veolia Water Indianapolis the first U.S. water company to be simultaneously certified in both.

At Tampa Bay Water, Veolia provided the DBO of a then new 60-MGD surface water plant using an approach that saved $85 million over the life cycle of the facility. We are also experienced in reducing industrial water demand, working with industrial customers such as Toledo Refinery to recycle 50% of their wastewater back into the plant thereby reducing their demands on City of Toledo, Ohio, water supplies.

- **Employee Benefits and Three Years of Comparable Compensation and Benefits** - Veolia has completed the successful transition of municipal employees both union and non-union. This experience includes the transition of 450 employees at Indianapolis and over 200 employees at Milwaukee – including union and non-union groups. Our standard benefits provide a competitive wage and benefit package. Veolia also has experience in working with a broad range of labor groups with CBAs in place. For JEA this work will involve conducting a detailed assessment of the employee packages and any financial negotiations with the eventual owner and the strategic alternative selected.
- **Retention Payments** - The improved operations of the water and wastewater will contribute to the financial package offered by the eventual investor or JEA. This will help to ensure payment of the retention payments.
- **Commitment to New Headquarters and Economic Development** - Working with the owner of the utility, Veolia will commit to the necessary office space commensurate with its scope and compensation. Our firm has made similar types of commitments in the past for major water and wastewater utility operations.

Veolia Capabilities & Results

JEA's water and sewer systems represent one of the largest municipal utilities in the country to consider a separate sale or alternative management approach. Veolia, in the U.S. and globally, has the resources to operate your agency's water and wastewater system. We are a financially strong company, with more than $30 billion in revenues globally and an unmatched base of experience and resources.

Key U.S. Work Experience

In the U.S., Veolia ranks as the largest and most successful contract operators, with over $2.6 billion in revenue in 2018 and operations and management responsibility for: 210 municipal wastewater treatment plants that treat over 1.7 billion gallons of flow each day to meet the needs of more than 5.4 million people; along with 89 municipal water treatment plants that supply potable water to more than 4.7 million people.

Veolia is ready to partner with JEA or consider teaming with any of the qualified firms submitting proposals for this proposed new strategic partnership. Our core area of services would build on the base of experience outlined above for the long-term O&M of your water and wastewater systems.

This is the type of approach that we have been able to deliver to large and diverse communities like yours, including:

- **Milwaukee, Wisconsin**, wastewater services to over 1.1 million people under a contract that has also included a resiliency study and an extensive community involvement and education program.
- **Tampa Bay, Florida**, water supply services to more than 2.4 million, with the initial plant and expansion to 120-MGD delivered under DBO agreements. The DBO project approach saved this client an estimate $85 million over the life of the contract.
- **Fulton County, Georgia**, multiple contracts that cover wastewater and water operations that serve areas of the City of Atlanta and other parts of Fulton County. The largest of the wastewater operations in Fulton County includes a regional education center that is operated by Veolia at the County's water reclamation plant.

- **Buffalo, New York**, management of a water system that serves more than 280,000 people in and around the City, including an extensive customer service operation.
- **Downriver Utility Wastewater Authority (DUWA), Michigan** management of a 150-MGD regional wastewater plant and lift stations, serving a population base of more than 350,000 in a service area composed of 13 member communities. Our innovative partnership with DUWA enabled it to purchase the wastewater assets from Wayne County and control its own destiny with respect to rates and future capital investment.

Additionally, under a comprehensive five-year innovative agreement that began in 2011, Veolia worked with the New York City Water Board, the Department of Environmental Protection (DEP) under the Operational Excellence (Opx) program. Under this contract Subject Matter Experts from Veolia's North American and global operations groups teamed with public-sector professionals from the DEP to identify and implement improvements in every aspect of New York City's water and wastewater infrastructure. Working together Veolia and the DEP implemented individual improvement ideas, and the overall impact was $82 million in savings and improvement on an annual basis.

[Tab 7 of this ITN submittal provides a copy of the final report for the Operational Excellence program, which provides further information on this program.]

Similar Financial Transactions

Innovative contract structures have helped Veolia adapt our operations approach to a wide range of situations and customer demands.

Veolia's ownership and management of the municipal wastewater treatment plant at **Franklin, Ohio**, has been highly successful and was recognized with a Project Award, National Council for Public-Private Partnerships.

"… Thank you for the excellent service you have provided… you have always acted quickly to resolve any issues and take the necessary steps to prevent future issues. I appreciate your ease of communication… It allows me to be confident that the plant is always being operated in a most effective way. I look forward to continuing this partnership!"

– Cheryl Shields, Administrator,
Franklin Regional Wastewater Treatment Corporation

- **First Wastewater Privatization** - Nationally, our company's financial structuring experience traces its history back to a pioneering project in **Franklin, Ohio**. In 1987, the Miami Conservancy District (the wastewater utility) selected Veolia to provide O&M services for the Franklin Area Wastewater Treatment Plant. In 1995, the Franklin facility was sold by the Miami Conservancy District to Veolia, marking the nation's first transition of a municipally owned wastewater treatment plant to private ownership. This public-private partnership was part of a U.S. Environmental Protection Agency (U.S. EPA) pilot program for the private ownership of federally and state-funded municipal wastewater treatment facilities. This transaction marked the first U.S. EPA and Office of Management and Budget (OMB) approved transaction under Presidential Executive Order 12803. The asset purchase provided defeasance of existing municipal bonds, with net proceeds to be used for infrastructure and tax reduction. This action immediately reduced annual wastewater treatment expenses by 14%.
- **Water & Wastewater Concession** - In other examples of our firm's acquisition experience, Veolia is currently working as the O&M contractor to a private owner (**Rialto Water Services**), which has a 30-year concession agreement with the **City of Rialto, California**, for the ownership, operation and management of their water and wastewater utility. Veolia worked with the City for eight years as their O&M provider, and that contract was transitioned to a new agreement with Rialto Water Services, the concessionaire of the City's water and wastewater systems. The City of Rialto's water utility system receives 70% of its potable water from groundwater wells with chlorine treatment at the well heads, and the remaining 30%

of the water is from other sources. Veolia routinely performs raw and finished water sampling in accordance with state regulations to identify issues with either of the water sources and solve any problems.

- **Wastewater Concession** - Veolia has other concession and similar types of agreements with communities such as the **City of Cranston, Rhode Island** where we work with the City (as the owner of the wastewater utility) to change a traditional O&M contract to a utility privatization approach under a lease-management agreement with a 30-year term. The contract includes responsibility for capital planning and upgrades and long-term renewals and replacement of assets in a "full risk" model where Veolia is responsible for managing all operating and capital costs.

Key International Work Experience

On a global basis, Veolia meets the water and wastewater needs of large municipalities with operations needs similar to those of the JEA. Our scope of services includes research and innovation, the manufacture of water treatment equipment, design and construction services, as well as full service O&M. Our clients include many of the world's premiere cities, such as:

- **Lyon, France**, where Veolia provides water to more than 1.3 million people in 59 municipalities;
- **Sophia, Bulgaria**, a community of 650,000 customers where Veolia provides water and wastewater service;
- **Paris, France**, on behalf of the Ile de France Water Authority (SEDIF), the largest water authority in France, Veolia manages the drinking water supply for communities in Paris suburbs, supplying more than 4.5 million inhabitants and over 584,000 connections;
- **Shenzhen, Guangdong Province, China**, a 50-year concession agreement for the operations and management responsibility for a water and wastewater system that serves more than 3.5 million people.

These projects have involved the use of innovative technology to generate improved customer service, reduced costs and more reliable performance while responding to the disruptive forces facing communities across the country and the globe.

Innovative Solutions

Our O&M services have included assistance on climate change initiatives. That work included resiliency studies for the communities of **Milwaukee, Wisconsin**, and **New Orleans, Louisiana**.

The work at Milwaukee involved conducting an analysis of the risks and challenges facing this region, a prioritization exercise during workshops conducted with the 28 municipalities constituting the "Milwaukee Metropolitan Area" as well as a panel of stakeholders with vested interest in the process to outline a regional action plan for territorial actors. (https://www.mmsd.com/about-us/news/mmsd-2019-resilience-plan).

The resilience plan identified 20 actions chosen by stakeholders, grouped into three vision categories and has focus areas – in-line with the 100 Resilient Cities focus areas. Each of these visions was accompanied by a set of actions, including those to support the water and wastewater infrastructure. [Tab 7 of this ITN submittal provides a copy of the Milwaukee Resiliency Report, which provides further information on this program.]

Best Value Choice

Veolia is unmatched in terms of our firm's ability to provide high-performance and efficient utility water and wastewater operations, maintenance and customer service for JEA. We understand the challenges that JEA faces and the constraints that it operates under and believe Veolia brings significant value to its path forward. Veolia has fostered a culture of operations excellence and innovation that has served to maintain our firm's position as the industry leader and provided the opportunity to build some of the industry's most successful partnerships.

Our proposed approach is the beginning stage of a path to maximizing customer, community, environmental and financial value for JEA. We look forward to your review of our response and to working with you through the next steps of the process as we develop our proposal and set the course for a successful new long-term utility operations, maintenance and customer service partnership between JEA and Veolia.

TAB 3

Statement of Interest and Qualifications

Veolia - Buffalo, NY

Water Operations Contract

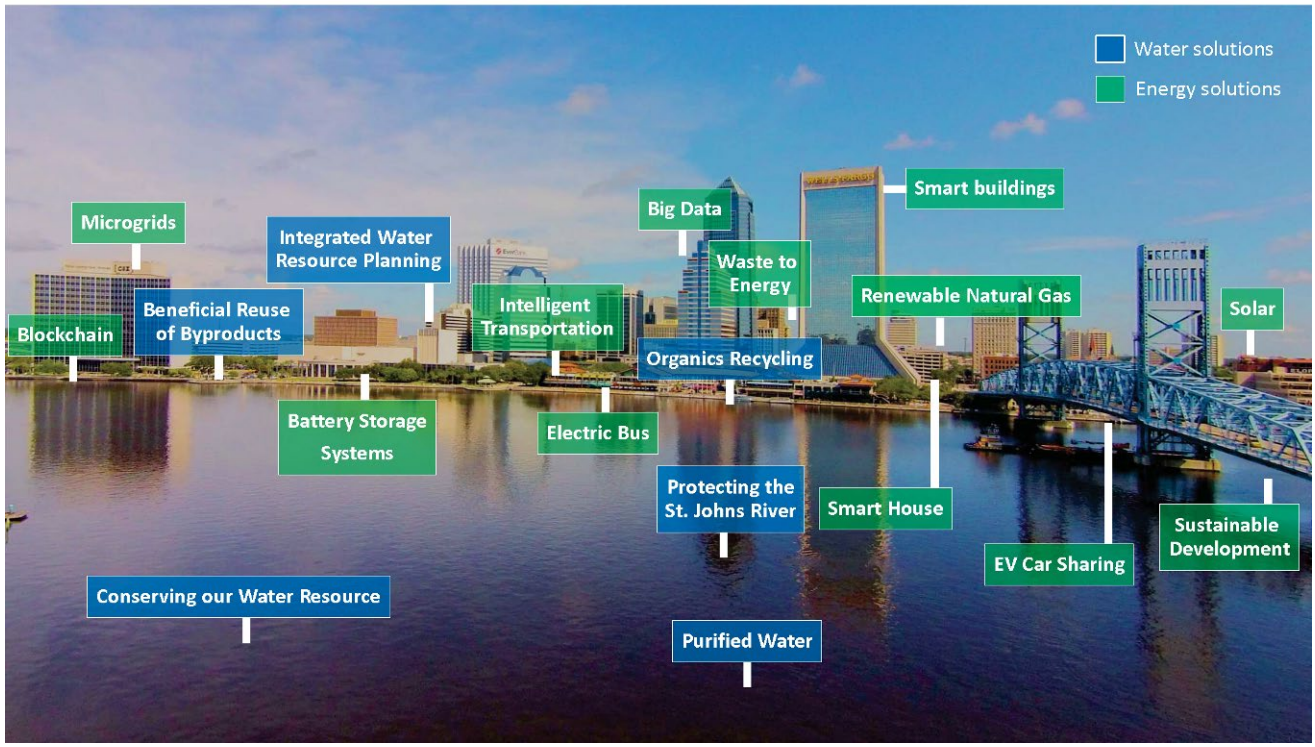
Tab Three:

Statement of Interest and Qualifications

Statement of Interest

Veolia understands that the JEA is seeking approaches that will maximize customer, community, environmental, and financial value over the long term. We also understand that the JEA is using this Invitation to Negotiate (ITN) process to obtain proposals for approaches that build upon JEA's strengths and seek to eliminate certain existing business constraints.

That is a unique opportunity, and Veolia as the global leader in water and wastewater management is excited to respond. We can add significant value to unlock JEA's growth potential through a wide range of innovations focusing primarily in the areas of water and wastewater solutions.



Veolia is proposing a solution that will assist in maximizing the Customer, Community, Environment and Finance value for citizens. Our objective in submitting this response to your ITN request is to detail the specific areas we can add value and propose a methodology to capture that value in the most beneficial and expeditious way to JEA.

These areas would cover the Water Solutions scope of work that was outlined in your ITN document. Specifically, as we have outlined in this response, Veolia is offering to provide operations, maintenance and management (O&M) services for JEA's water and wastewater systems.

This is an area in which our firm can offers tremendous value to JEA through our experience in managing similar sized utilities in the U.S., North America and across the globe.

In this section we highlight this type of experience and expertise in our work with clients such as Tampa Bay Water here in Florida and other key clients in the U.S. and internationally.

Veolia also understands that the JEA is looking for a response with regard to interest in the potential purchase, recapitalization and/or operation of the JEA utility systems, including how the utility systems may be an attractive and beneficial addition to the Respondent's organization.

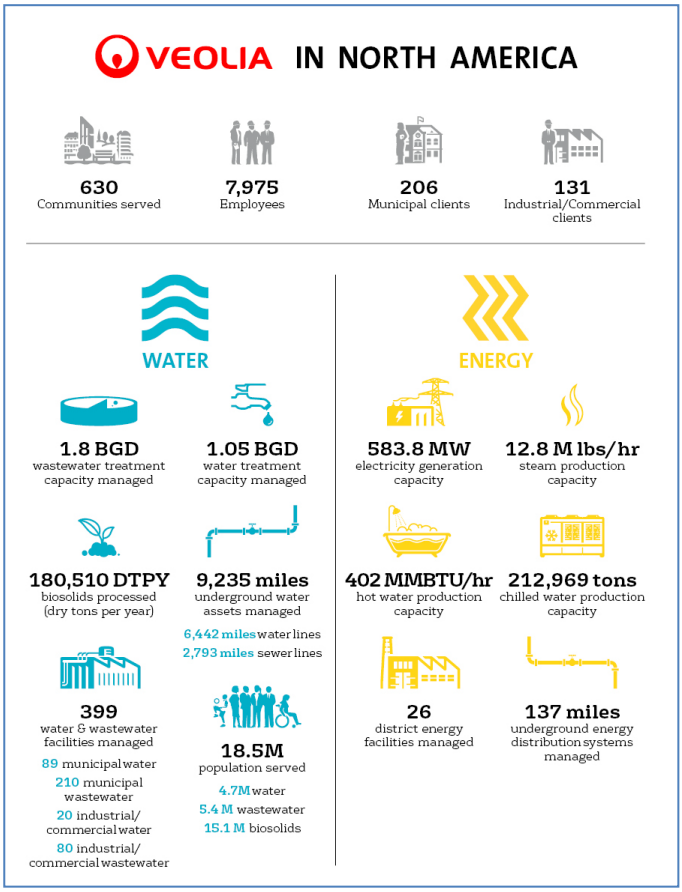
Given our firm's broad base of current work in the energy and water sectors in North America and globally, as the summary graphic (opposite) details, Veolia can work with the JEA and any partner that you may select under this procurement process to support any type of partnership, ownership or management structure that you develop.

What this means is that Veolia is prepared to be flexible in our delivery models so that we can offer value in any of the Strategic Alternatives being considered.

Further, our approach would be to accelerate the change needed at your organization and to respond to the trends facing JEA.

Our company can also oversee, as part of this service approach, capital planning and construction, or we can offer any part of those services in a wide range of contract formats.

The ITN also asks for Strategic Alternatives but Veolia will focus not just on the future but also on the issues facing the JEA today, including water flow between north and south sections of the water system, compliance, training employees and answering customer inquiries.



The combination of electric, cooling, water and wastewater makes JEA an attractive utility for investors and utilities. But that broad spectrum of operations and the alternatives being considered by your agency means the final decision on ownership and operations may be quite unique.

Efficient and effective management of water and sewer is valuable to whatever Strategic Alternative is selected.

With our background around the globe, Veolia has helped clients adapt to a number of different ownership structures, and that flexibility offered is needed because of the journey JEA and the City will have to take in successfully accomplishing the change sought.

Veolia, as the project examples discussed in this section serve to document, has been successful in all of the options discussed in your ITN document, including:

- **Intent to Operate** - Veolia, as we discussed, is offering to provide the O&M of the water and wastewater system. This would include the water wells, treatment, distribution, customer service and billing, wastewater collection and treatment, capital planning and management.
- **Impact on Purchase or Recapitalization** - The intent of offering O&M services is that any of the options considered – Community Ownership, Initial Public Offering, Private Placement, Technology Conversion, Oil/Gas conversion or utility Conversion – could benefit from Veolia's expertise in the management of water and sewer. Because of the size of JEA's anticipated transaction, it is difficult for a single entity to have all the experience needed in electricity, cooling, water and wastewater. As such a qualified firm with the requisite experience is needed as a teaming partner. Depending upon a sale or concession the O&M partner will be required to act as an investor but at least maximizing the value of the water and sewer utilities to contribute to the financial success of the project.
- **Approach that will be Attractive and/or Beneficial to Your Agency** - JEA has identified multiple options for ownership. Effective and efficient operations will be critical to which ever option is selected. The control of operating costs going forward will also be important to success of a new ownership structure, and further will contribute to the financial commitments required. This is where the experience and expertise that Veolia offers will be critical to the long term success of this new initiative by JEA.
- **Expectations of Future Partnership, Ownership or Management Structure for the Electric and Water and Sewer Utilities** – As we have discussed in this response, Veolia is interested in the management and operation of the water resources, water treatment, water distribution, water metering and customer service, wastewater collection, wastewater treatment, effluent disposal and reuse. This is where we can provide the best value as an operations partner to your agency and/or to any new owner that may be engaged as part of this procurement.

In the remainder of this section we profile some of the key experience that Veolia offers to demonstrate our innovative approaches and our ability to effectively support water and wastewater operations that are comparable to yours.

Statement of Qualifications

The primary focus of Veolia in terms of this submission is to demonstrate our qualifications for the O&M of the JEA's water and wastewater systems.

With that said, our firm does have experience with the O&M and/or ownership of district energy systems in the U.S. and Canada. These systems, 26 in total, provide steam, hot water and chilled water services to more than 1,330 clients – delivering over 12 million pounds per hour of stream capacity, more than 400 MMBTU per hour of hot water capacity, as well as more than 213,000 tons of chilled water capacity. Globally, Veolia's energy management services involve producing over 45 megawatt hours of energy and converting over 47 million metric tons of waste materials into new materials and energy.

The largest part of our business base in North America, and globally, is the operations and management of water and wastewater systems – with operations responsibility for systems that serve over 615 communities. This includes O&M for: 210 municipal wastewater plants that treat more than 1.7 billion gallons of flow each day to meet the needs of over 5.4 million people, along with 89 municipal water treatment plants that supply potable water to more than 4.7 million people. Globally, Veolia has been providing water and wastewater service for over 166 years, and today supplying more than 96 million people with drinking water and more than 62 million people with wastewater service.

In the sub-sections that follow we provide selected examples of our experience that documents our key local experience here in Florida, that in other parts of the U.S., as well as the global experience of our company.

Key Work Experience: State of Florida

Veolia's experience covers more than three decades of water and wastewater operations in the State of Florida, which includes almost 20 years of work with **Tampa Bay Water**.

Tampa Bay Water provides water supply services to more than 2.4 million in Central Florida – supplying wholesale drinking water to Hillsborough County, Pasco County, Pinellas County, New Port Richey, as well as to the cities of St. Petersburg and Tampa.

Veolia has worked with this regional water agency since 2000 under multiple contracts. The initial design/build/operate (DBO) contract was for a then new 66-MGD regional Surface Water Treatment Plant, which was expanded to 120-MGD under a separate DBO project that came online in 2011.

The DBO process provided Tampa Bay Water with performance guarantees in the areas of water quality and quantity, and a guaranteed not-to-exceed price for project delivery from Veolia; as our firm managed all aspects of DBO process.

The original DBO contract included more than $83 million in capital (construction) costs and over $61 million in O&M fees, which are expected to generate a 21% savings, or about $85 million, over the 20-year life of the original contract.

Tampa Bay Water Awards:

- 2017 - Platinum Award for Utility Excellence Outstanding Water Treatment Plant Class A - American Water Works Association – Florida Section (AWWA)
- 2015–Chairman's Award, Florida Water & Pollution Control Operators Association (FWPCOA)
- 2013 and 2012–Plant Operations Excellence Award, Florida Department of Environmental Protection
- 2005–Outstanding Water Treatment Plant Award - Class A Category, AWWA Florida Section
- 2005–Taste Test Award, AWWA Region IV Florida Section
- 2004–Facility Excellence Award for Outstanding O&M of a Water Treatment Plant, FWPCOA
- 2003–Infrastructure Award, National Council for Public-Private Partnerships
- 2003–Build America Award, Associated General Contractors of America
- 2003–Grand Prize-Design, American Academy of Environmental Engineers
- 2003–Facility Excellence Award, FWPCOA

In April 2007, Veolia Water's contract with Tampa Bay Water was expanded again, as our firm (in a DBO partnership) was selected for a plant expansion that nearly doubled the size of this facility to 120 MGD. This contract amendment, amounting to $158.4 million over its term, ranked this project as the largest water DBO project in the U.S. The expansion contract is expected to yield savings similar tithe original agreement.

Under separate agreements, Veolia provided maintenance and monitoring services for Tampa Bay Water's 15-billion-gallon capacity raw water reservoir. This work involved water quality monitoring, mowing, invasive species eradication, stormwater pond management, control structure inspection, soil cement monitoring, general housekeeping, and maintenance of monitoring devices such as piezometers and extensometers. Veolia also has an ongoing O&M contract for Tampa Bay Water's 30-MGD S.K. Keller Hydrogen Sulfide Treatment Facility, which treats groundwater supplies for the service area.

Under a separate contract that began in 2013, Veolia successfully completed an Engineer-Procure-Construct Management (EPCM) project for the construction and startup of the Lithia Hydrogen Sulfide Removal Facility. Veolia completed the work $1.2 million under our guaranteed maximum price, and the 45-MGD groundwater ozone treatment system is now in operation.

Veolia also has a long history of working with the **City of Palmetto** which began in 1991. This O&M contract includes responsibility for the City's 2.4-MGD wastewater treatment plant, 39 lift stations, reclaimed water and a biosolids land application program for the disposal of 250 dry tons of solids a year.

Veolia's current work scope under the ongoing contact with the City of Palmetto covers the following:

- **Meeting Stringent Water Quality Standards** - Palmetto's facility is an advanced treatment plant because the facility discharges into Terra Ceia Bay, a Class II waterway that is qualified for commercial shellfish harvesting. As a result, the Palmetto plant operates under one of the most stringent effluent quality permits in the country.
- **Providing for Water Reuse** - The City's wastewater infrastructure includes a water reuse (reclaimed water) system where effluent is used by residents and the City to irrigate lawns and recreational facilities, including a golf course, baseball park and soccer fields. The City's reuse water system required additional final clarifiers and effluent filters to handle the increased loading. Effluent reuse has increased the plant's treatment capacity by 60%, saving as much as $1 million in future capital for plant expansion.
- **Managing Capital Improvements** - Over the past decade, under this contract, Veolia has managed over 50 capital projects for the City that totaled nearly $3 million – saving the City approximately 10% over the cost of hiring an engineering firm. For this work, we used the internal resources of Veolia's Capital Program Management (CPM) group in the South. This group managed the completion of the innovative Class V Aquifer Storage and Recovery (ASR) at Palmetto (profiled above). The schedule for that project was accelerated by breaking out the ASR and monitoring wells into a separate Guaranteed Maximum Price (GMP) package in order to secure Southwest Florida Water Management District (SWFWMD) matching funds. This allowed for both projects to be completed ahead of schedule and under budget.

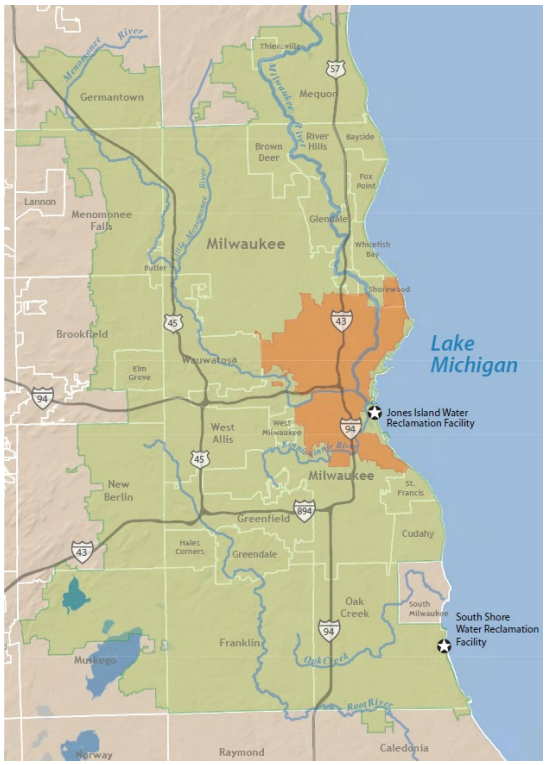
In 2015 Veolia completed a capital upgrade contract at Palmetto for construction management, startup and now O&M services for a new Class V ASR Test Well Pumping and Treatment System, Aquifer Storage and Recovery. The ARS allows the City's treatment plant to inject excess reclaimed water during wet seasons into the ground for storage, which then can be withdrawn to use during higher demand and drier seasons. The work was coordinated by our O&M team at and managed by our regional CPM group.

Key Work Experience: Large Water and Wastewater Systems

Veolia's work with the **Milwaukee Metropolitan Sewerage District** (MMSD) in Milwaukee, Wisconsin, ranks among the largest ongoing municipal wastewater O&M partnership in the U.S. and began back in 2008. MMSD is a regional government agency that provides water reclamation and flood management services for more than 1.1 million people in 28 communities in the Greater Milwaukee Area.

The MMSD's 420-square-mile service area includes 18 municipalities, and all or part of 10 municipalities in the surrounding counties of Ozaukee, Washington, Waukesha and Racine. Approximately 400 square miles or 95% of the service area has separate sanitary sewers and storm sewers, while the remaining approximately 20 square miles, or 5% percent of the service area, has combined sanitary and storm sewers. This contract was recently renewed for a new term and includes O&M responsibility for:

- Two treatment plants, including the 330-MGD Jones Island secondary activated sludge wastewater treatment plant, and the 300-MGD South Shore tertiary activated sludge wastewater treatment plant.



- Interplant Solids Pipeline System (between Jones Island and South Shore)
- Collection and conveyance system, including 374 miles of sewer lines, 28.5 miles of stormwater lines, a 500-million gallon deep tunnel system and 18 pump stations
- Biosolids handling - 51,000 dry tons per year (dtpy), with 48,000 dtpy Milorganite production management.

  Milorganite is the MMSD's branded fertilizer product and is manufactured by Veolia.
- Management of the advanced asset management and capital programs, the central control system, the rolling stock, as well as the easements and other right-of-ways owned or controlled by the MMSD.

Two major requirements of the contract are to effectively manage wet weather events and provide a CCTV condition assessment of all gravity sewers.

Through implementation of the most modern methods of underground asset management, we are improving the integrity, dependability and functionality of the system.

Veolia is also implementing state-of-the-art programs that annually verify the operational readiness of critical system components and improve remote monitoring to provide more complete feedback on real-time system performance; and maximize treatment efficiency. We also are charged with constant emergency/overflow response readiness, and we implemented a robust community education program to educate all that are interested about the proper operation of the District's conveyance and collection system. Additional improvements are ongoing. Under the leadership of a dedicated Veolia Capital Program Manager, along with support resources from our company at-large and the MMSD, we are working together to develop a long-range Capital Improvements Program.

In 2018, Veolia was selected by the **Downriver Utility Wastewater Authority (DUWA), Michigan**, as this new agency assumed the wastewater assets of Wayne County. The DUWA systems now ranks as the second largest wastewater system in the State of Michigan, serving a population base of more than 350,000 in a service area composed of 13 member communities. DUWA worked with Wayne County on an asset transfer of the Downriver Sewage Disposal System (DSDS). As part of that process, DUWA initiated an RFP process for a contract O&M provider. Veolia responded to the RFP request, and was selected as the preferred provider.

Veolia completed a 90 day transition and is now operating the wastewater facilities under a 20-year O&M agreement. This new project involves providing O&M of wastewater facilities, as well as the development of capital planning recommendations. The wastewater treatment plant, located in the City of Wyandotte, is served by approximately 63 miles of interceptor pipe that is used to convey wastewater from 13 tributary

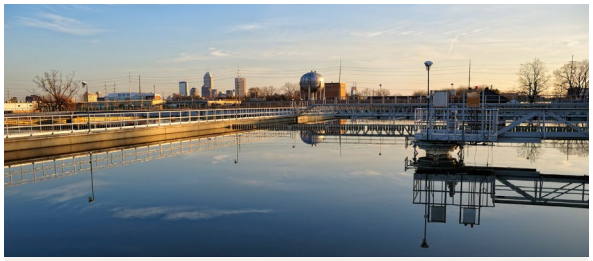
communities and several Drainage Districts that operate wet weather storage facilities in the Service Area. The 225 MGD plant has the capacity to provide primary treatment for up to 150-MGD, and capacity to provide secondary treatment for up to 125-MGD. The wastewater plant treatment process consists of influent pumping, preliminary treatment, primary treatment, secondary treatment (high-purity oxygen activated sludge with secondary settling), and UV disinfection. Treated effluent is discharged to the Trenton Channel of the Detroit River. The system also includes a 15 million gallon wet weather storage tunnel that is used to retain excess wet weather flows during rain events.

In other parts of North America, Veolia operates and manage other large water and wastewater systems including:

- **New Orleans Sewerage and Water Board, Louisiana** – Veolia has provided O&M services at New Orleans since 1992, with responsibility for two wastewater treatment plans (122-MGD and 20-MGD), and a biosolids incineration operations.

  When Hurricane Katrina struck the City of New Orleans in 2005, Veolia worked with New Orleans to manage and implement over $47 million in hurricane recovery work, coordinating capital project funding through the Federal Emergency Management Agency (FEMA).

  Hurricane recovery work and other capital projects completed by Veolia since 2005 have included: a $4.8 million project for 70-ton/day liquid oxygen facility; a $23 million project for a new 4-MW generator; a $6.5 million capital project for the rebuild of the incinerators; a $5.4 million project for replacement of the incinerator's exhaust heat exchanger; installation of a new air scrubber unit to meet the new U.S. EPA 129 emission limits at a capital cost of $1.25 million; as well as an ongoing capital project for planning, development and implementation of an innovative scalping dryer system ($3.9 million in equipment cost and $1.2 million in construction costs).



For almost a decade Veolia managed an innovative water operations partnership with the **City of Indianapolis, IN**; delivering a transition approach that changed the management and operation of the City's water department. Veolia's management team achieved significant cost savings, organizational and operational improvements, technological advancements and management efficiencies. The Indianapolis water system is comprised of four surface water treatment plants (16-MGD to 96-MGD), five groundwater treatment plants (2-MGD to 24-MGD), a 4,300-mile distribution system, 29 water pump stations and multiple surface reservoirs and storage tanks. The Indianapolis water supply system also has multiple water pressure zones, with 15 districts and five sub-districts.

Veolia also initiated a new standard for water utility operations and service excellence at Indianapolis, completing the rigorous program for ISO 9001 and 14001 standards. This made Indianapolis the only major city in the U.S. that had achieved these standards for its water operations, and Veolia Water Indianapolis the first U.S. water company to be simultaneously certified in both.

- **City of Buffalo, New York** - This project ranks as the largest water system under contract O&M in New York State. Under this long-term contract, Veolia is responsible for managing the day-to-day operations, maintenance and repair of the water systems of the treatment, pumping and distribution facilities. The objectives of our management team under this contract focus on extending the useful life of the water infrastructure, providing maximum capacities, preventing unnecessary damage to public and private property, minimizing inconveniences by handling interruptions in service and preventing public health hazards. We also manage the day-to-day operations of the customer service department, including: billing and collections; account management; metering functions; accounts payable and any necessary administrative functions.

  The City of Buffalo was also one of the first cities in the U.S. to use Veolia's in-house Meter Testing Facility. Under that approach, some 400 meters from the City were sent to that facility on an annual basis for accuracy testing and evaluation of remaining life. On average, Veolia repairs/replaces more than

3,400 meters annually in Buffalo, and customer service metrics involve answering up to 7,000 calls a month in one minute or less and collecting 96% of meter revenue.

Veolia has also implemented plant maintenance and asset management programs and these have resulted in significant improvement in reliability, safety and other key performance indicators (KPIs). Some 20 performance metrics were developed to track and determine Veolia's performance and accountability under this partnership, and service improvements are being phased in over the life of the contract.

Key Experience: Other Project Delivery Models

Veolia has also worked with municipal clients and other under concession types of agreements and two key examples of this include ongoing projects at:

- **Borough of Naugatuck, Connecticut** – Veolia has two ongoing full-risk contracts with the Borough for O&M of a 10.3-MGD wastewater treatment plant, and a lease agreement for operations and management of a merchant biosolids operation. Over the past 15 years, Veolia has managed and implemented over $36 million in capital work, which has included improvements and upgrades for the merchant operations and the treatment plant – with more than $8.7 million in upgrades completed in 2018.
- **City of Rialto, California** - Veolia worked with the City for eight years as their O&M provider, and that contract was transitioned to a new agreement with Rialto Water Services, the concessionaire of the City's water and wastewater systems.

  At the start of the initial O&M agreement with the City of Rialto, Veolia conducted an initial condition assessment of the utility assets to determine the baseline condition of the assets and to identify areas requiring immediate attention to ensure reliable service and begin lowering life-cycle operation costs.

Veolia began working with the Borough of Naugatuck, CT, in 2001, under an interim wastewater facilities O&M agreement that was expanded to a 20-year design/build/operate (DBO) agreement that covered the upgrade and expansion of the wastewater plant and implementation of a regional and merchant biosolids dewatering and incineration operation. Collectively, these facilities, which are located on the same site and comprehensively integrated with each other, are referred to as the Water Pollution Control Facility (WPCF). Veolia's merchant biosolids program at Naugatuck now addresses the needs of the Borough's wastewater plant and generates revenue by processing biosolids from 60 other communities. The merchant biosolids operations functions 24/7, with an average 95% processing uptime that achieves world-class benchmarks for solids incineration.

Following the completion of the initial system evaluation, we prepared a list of 50 critical needs for the operations. Veolia's O&M and capital program team then developed a five-year prioritized implementation plan for the City, assisting them with the development of their long term Master Plan. The initial $7 million capital improvements program developed by Veolia (covering $4 million for the wastewater system and $3 million for the water system) created operational savings for the City of more than $2.5 million under the initial O&M contract (2003-2012).

Veolia also implemented Reliability Centered Maintenance (RCM) program, registering all the underground and aboveground assets into the asset management program. This program reduced energy costs by $135,000 in the first year of the O&M contract, with a projected 30% reduction in capital replacement costs through increased life expectancy of equipment.

Rialto Water Services, LLC (RWS), the concessionaire of the City's water and wastewater systems, was established under a privatization agreement in 2012 to address the City's interest in completing critical

water and wastewater system capital improvement projects and implement efficiency improvements, without adding financial risk to the City. Under the RWS concession contract, the City retains ownership of the water and wastewater systems, water rights, and the rate-setting authority. RWS provides financial backing, oversight and concession services, and Veolia, as a direct contractor to RWS, delivers all water and wastewater O&M services, and oversees a $41 million capital improvement program.

The Rialto operations are now serving as a demonstration project for the BDP® EnviroTech energy saving technology. The project combines wastewater aeration technology and an integrated all-in-one bioreactor process. The all-in one bio-reactor saves construction costs and reduces footprint requirements compared to traditional systems. The assessment is to determine if energy consumption can be reduced. The demonstration project is funded through a grant from the California Energy Commission and is operated by Veolia's O&M team.

Key Work Experience: International Water and Wastewater Operations

In other parts of the world, Veolia manages major water and wastewater systems, and some key examples of this experience include:

- **Shenzhen, Guangdong Province, China** - Shenzhen is a major city in Southern China, located at the border with Hong Kong, and is designated by the Chinese Central Government as a major economic zone. As the area developed and the need for better services became more apparent, the municipality opened up a number of public utilities services to the private sector. This included a public bidding process for the water sector organized in 2003. Veolia, in association with Beijing Capital Group, was awarded the Shenzhen contract.

Under the agreement, Veolia co-manages SZWG's water production and distribution, wastewater collection and treatment and all customer services for residents in Shenzhen for 50 years. Shenzhen is one of China's most important business hubs, and Veolia's contract covers the Shenzhen special economy zone (the city's business district), which currently totals more than 2.2 million people, who are served by more than 2,400 employees.

Optimizing asset and network management has been vital to SZWG's improvement of the water infrastructure in the Special Economic Zone. A high corrosion rate due to low mineral levels in water, technically depreciated pipelines and facilities after many years of use, and a higher national drinking water standard imposed for 2012 have all created pressure on the water distribution system. The partnership has strengthened water process and network maintenance by deploying first-rate technology, equipment and management solutions to analyze pipes and enhance their quality. The improved network condition has now resulted in service continuity and water quality. Technologies installed have included various digital tools such as GIS, hydraulic model and SCADA.

Veolia also worked to get the central laboratory set up and accredited/certified under ISO 17025 in 2005. This certification recognizes calibration laboratories achieving operational effectiveness of the quality management system, as well as competence of staff, methodology, and calibration equipment. Regulated by the Water Quality Monitoring Centre, the central laboratory monitors respective laboratories within the joint venture. Participation in Veolia Water's international inter-calibration laboratory test among other 40 specialized labs has been worldwide since 2004. The joint venture's laboratory has achieved an A grade for most of the parameters measured.

Additionally, the customer service centers were renovated, offering a new look and new value-add services for customers. A new service launched for customers to settle water bills in any customer service center was launched in August 2008. The service offers more flexibility for customers, as they can make their water payment in the customer service center most convenient to them. There are also dedicated teams established for large-consumption customers.

- **Syndicat des Eaux d'Ile de France (SEDIF), Paris, France** – SEDIF is the largest water authority in France and that agency's water operations have been managed by Veolia since its inception in 1962. The operations cover drinking water supply for 150 councils in the Paris suburbs and the Ile de France region.

The Choisy-le-Roi plant: a flagship for innovation since 1861

Covering 16 hectares, the Edmond Pépin plant in Choisy-le-Roi is one of the world's largest water treatment plants. Built at the end of the 19th century, the plant has undergone several modernisation projects, making it a technical, industrial and environmental model for France and Europe. **For over 10 years, €150 million have been invested** in Choisy-le-Roi to renovate its facilities, keep industrial machinery up to date and to meet increasingly stringent regulations with room to spare. In a constant state of evolution, the Choisy-le-Roi plant continues to undergo modernisation work with the renovation of its sand filtration units scheduled as part of the 15th five-year investment plan (2016-2020).

300,000m³/day
1.84 million residents covereds

Maximum capacity of
600,000m³/day

ULTRAVIOLET HAS ARRIVED: IMPROVED QUALITY AND SAFETY

In order to improve water treatment safety, and being always attentive to the quality of the water produced, SEDIF will boost the effectiveness of its Choisy-le-Roi water treatment plant with the addition of an ultraviolet treatment stage, just as it has for Neuilly-sur-Marne (which serves the east of Paris). Representing a total of €9.5 million excluding tax, these two facilities are the last of three disinfection stages made up of chlorination, ozonisation, and ultraviolet. This process has been around for years, but has never been used on in France on the same scale as Choisy-le-Roi.

The Neuilly sur marne plant: spanning the Marne

The Neuilly-sur-Marne/Noisy-le-Grand plant is one of the largest water treatment plants in the world, and supplies the area around Paris. Located on the banks of the Marne River, just over 20 kilometres upstream of where the river meets the Seine, **the site covers 25 hectares**.
It is unique in that it occupies both banks of the Marne River connected in 1967 by a 105m viaduct that transfers treated water from one bank of the Marne to the other. Since 2010, this exceptional facility has included an inter-plant pipeline.

255,000m³/day
1.78 million residents covered
Maximum capacity of **600,000m³/day**

NEW LIFTING UNIT IN NEUILLY-SUR-MARNE: A UNIQUE FACILITY

Worth €31.15 million, the renovation work on the Neuilly-sur-Marne lift unit constituted one of the largest projects in the 13th SEDIF investment plan.
The project ran for 10 years and led to the development of unique facilities to replace the outdated machinery for a safer water supply. Its main role is to pump drinking water to clearing tanks and up towards the transportation network and the first water reservoirs. With its impressive machinery that can generate a maximum capacity equal to 33,000m³ per hour, this is an iconic project .

The Méry-sur-Oise plant: a cutting-edge facility

The Méry-sur-Oise plant provides 151,000m³ of water every day to 840,000 customers in the northern Parisian suburbs. By dealing with the chronically polluted Oise, a river exposed to major risks of agricultural and industrial pollution, the Méry site offers a **model technical solution**.

The plant combines a number of cutting-edge technologies: multi-barrer treatment have been improved since 1965, nano-filtration since 1999, and since 2009 effluent is treated to further improve water quality of discharge to the river.

151,000m³/day
840,000 residents covered

Maximum capacity
of **340,000m³/day**

NANOFILTRATION: CUTTING-EDGE TECHNOLOGY

Nanofiltration is the technology best suited for treating the water of the Oise.
After trials with a prototype launched in 1993, SEDIF decided to roll out the technology on a larger scale, becoming the first water provider in the world to use nanofilters to produce drinking water from surface water.
The Méry-sur-Oise plant uses this treatment method for 70% of its production, with the remaining 30% using "multi-barrier treatments". The water produced by these two methods is mixed before network distribution, for a fresher water of an exceptional quality.

These systems supply more than 4.5 million inhabitants and include: three drinking water production facilities, as documented in the information sheet above, including the Choisy-le-Roi Plant (158.5-MGD), the Méry Sur Oise Plant (89.8-MGD), and the Neuilly Sur Marne/Noisy le Grand Plant (158.5-MGD); four bore field systems with a production capacity of 18-MGD; 48 secondary pumping stations; 69 water tanks; four raw water quality monitoring stations; 8,683 km of water distribution pipes; and 584,013 connections. SEDIF deals daily with strong challenges related to a highly urbanized service area, high population density and the strategic characteristics of many of its customers. On top of that, the surface

water resources are especially exposed to climate change and constant or accidental pollution. In that context, Veolia has always been adaptable and present in assisting SEDIF to manage these challenges, by developing new production assets (Arvigny) or enlarging the perimeter to new councils, most recently (in 2016) including Saint-Maur-des-Fossés (80,000 inhabitants).

SEDIF has also remained a pioneer for many technologies that are now widespread across the World, including nanofiltration, integrated operation control center (ServO), smart metering and water plant operations automation. In 2011, SEDIF created the “Club for the world's premier water services” to infuse a spirit of exchange, dialogue and sharing of experiences with cities facing the challenge to distribute high-quality water in a context of constantly increasing urbanization -- as of December 2018, nine utilities are part of the program, including Sydney Water.

Under this contract Veolia has achieved ISO certifications (9001 and 14001) for drinking water production and distribution, customer reception and services, public utility concessions and assistance to the Greater Paris Water Authority, as well as for performance indicators and reporting. Over the years Veolia has remained close to 100% compliance with all the 136 Key Performance Indicators in place to measure the performance of the SEDIF water operations.

Veolia has an operations team of over 1,360 employees, and we have established training and recruitment programs that focus on discrimination prevention, and training/development programs for people with limited education (41% of recruitment through apprenticeship contracts). In 2018, the workforce completed 6,278 hours of technical training, 14,568 hours of qualifications training, as well as 10,865 hours of health and safety training.

The customer satisfaction rate for the operations is at more than 92%, a record of performance that was with an NF Customer Service Centre certificate. To improve customer service, Veolia implemented a smart-metering solution Teleo, which allows for billing based on actual consumption, the introduction of new services such as alerts in case of abnormal consumption, as well as support for leak detection. Additionally, Veolia established a customer relationship charter Clario, promoting 12 measurable engagements on the topics of timely intervention, availability, assistance, communication, clarity of information, hardship support, environmental commitments, etc., as well as the Eau Solidaire program to assist hardship customers in maintaining water service – with a 1.1 million EURO commitment to that program in 2018.

- **Prague, Czechoslovakia** - PVK is the first operation company in Czech Republic, providing water services to the 1.5 million inhabitants of the City of Prague and more than 200,000 other inhabitants in the suburban areas. Veolia is in charge of managing the whole water cycle operations, treatment and distribution of drinking water, and the collection and treatment of wastewater, under a 27 year agreement. The assets and operations include: two water treatment plants with a total capacity 265.7-MGD; 3,527 km of water lines and 51 pump stations; 3,647 km of sewer line and 313 pump stations; 21 wastewater treatment plants serving 1.6 million, with the largest plant (Prague 6) having a treatment capacity of 159.8-MGD. That plant uses primary physical and chemical treatment, secondary biological treatment including nitrification, denitrification and sludge treatment by thermophilic digestion with biogas recovery and energy production. The contract also covers responsibility for customer service for over 1.3 million (112,156 connections).

  In order to meet the European requirements, in 2014 Veolia has introduced a new innovative solution, SWiMs (Smart Water Integrated Management), which provides a monitoring and management control center covering the entire cycle, from the source to the consumers, including the collection of wastewater. Using this tool, millions of pieces of data are recorded and sent to the integrated operations

center which provides for: water infrastructure management, production and water consumption monitoring, cost optimization, incident management, the scheduling of preventive maintenance and repairs, as well as for resource management and information for customers and the general public. SWiM has improved access to information, communicates better with its clients and controls the water system more efficiently. Current Alerts Maps are available to clients in the SWiM database, providing progress reports on incident handling.

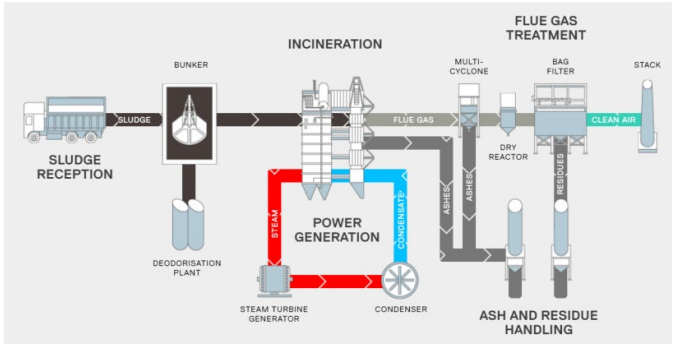
Veolia also offers the "My Water" app to drinking-water customers which provides an extensive range of services, including a map of service interruptions showing scheduled works and emergency situations, calculators for water consumption and CO_2 equivalent, results of water quality analyses, answers to frequently asked questions. My Water Plus gives Veolia customers online access to their account. Customers can use the app to submit a meter reading, get information on rates, view the map of service interruptions, and check their consumption, invoice and payment history. They can also change their contact details and payment method and book an appointment with an adviser.

- **Hong Kong, China** – This turnkey delivery project ranks as the largest design, build, finance, operate and maintain type service contract in the world (ongoing since 2010) and also the largest global biosolids incineration facility ever built. Each day some 110 trucks transport 1,200 metric tons of sludge to be incinerated at the new facility. These solids comes from the 11 sewage treatment plants in the territory that treat the wastewater for a population of 7.3 million

  The 600-dtpd plant used Fluidized Bed Incineration technology, and had a budgeted cost of over $660 million. The plant has an O&M team of 110 that are responsible for operating and maintaining the treatment and incineration process

  The Hong Kong plant (shown above) is located on a site facing Deep Bay and Shenzhen and was designed to match the environmental standards demanded by the Hong Kong government under its sustainable waste management strategy. The plant's main structures are the incineration-boilers generating steam to drive the electricity turbines, and the flue gas treatment units operating in accordance with the most stringent emission standards.

  At this site, Veolia operates four technology trains at the plant, which consist of a three-pass steam heated boiler/fluidized bed furnace, and inclusive of heat recovery for fluidized blower air preheater, multi-cyclone and bag filter dry ash system and multi-stage flue gas dry chemicals treatment. The process reduces waste by 90%, while protecting the natural environment and eliminating sea



Veolia was selected by the Hong Kong Government to build and operate an innovative biosolids plant from 11 wastewater plants in this territory of 7.2 million people. The plant's four-train technology solution has the capacity to process ~2,205 wet tons per day of mixed feedstock (anaerobically digested and undigested biosolids).

This plant also has its own independent water and energy supplies. The 600-dtpd fluidized bed incineration technology system was built using a phased contract, and Veolia operates two of the four technology trains at the plant, which consist of a three-pass steam heated boiler/fluidized bed furnace, and inclusive of heat recovery for fluidized blower air preheater, multi-cyclone and bag filter dry ash system and multi-stage flue gas dry chemicals treatment (bicarbonate and powder activated carbon). Heat and power that are generated as part of the biosolids operations are recovered.

discharges. Heat and power generated as part of the operations is recovered and used to heat three spa pools (located next to the plant) and to supply power to over 4,000 households.

The Hong Kong government included in its specification documents the creation of an environmental education center and a visitor circuit. This ecological complex also includes a wetland habitat for birds and a garden where the emphasis is on local biodiversity. The plant is also the only one in the world to include a visitor discovery gallery, a café, spa pools, 100-seat conference room and even a rooftop observation deck – all with a panoramic view over the sea and the city of Shenzhen from behind an immense picture window. A seawater desalination unit is used to meet potable water requirements at the Hong Kong facility, and over 1,000 trees have been planted at the facility site as part of a carbon compensation program.

Veolia's Hong Kong project is truly an energy self-sustaining regional biosolids processing facility and illustrates a green energy solution using thermal combustion.

- **Toulouse, France** - Veolia was awarded a concession contract in 1990 for the water and wastewater systems for the Greater Toulouse area, with a population of 460,000. This contract involves providing O&M, technical management, asset renewal, administrative management and networks end-user management.

Under this contract Veolia provided design/build services for two plants, the 33-MLD Ginestou Wastewater Treatment Plant and a second 33-MGD wastewater treatment plant

In 2003, Veolia upgraded the diversified biosolids management program to include a thermal reduction facility. A key component in the design/build delivery of the new plant was the scope of technology supply, which included dual trains of Veolia's Pyrofluid® FBI units and an integrated heat recovery and reuse system.

The thermal reduction facility produces dry ash and fly ash from the flue gas treatment system, which are classified as non-hazardous waste and as byproducts from combustion are hauled to landfill disposition via a licensed third-party trucking contractor.

Over the 30-year term of the contract concession, Veolia has provided various ways to manage biosolids in Toulouse. Since the commissioning of the FBI facility in 2003, the majority of the dewatered biosolids (53%) have been incinerated. The balance (47%) of the cake biosolids are processed for agricultural beneficial uses in which 20% is processed into compost and 27% into thermally dried pellets. Incineration has proven to be the most reliable and cost effective long term biosolids processing solution.

TAB 4

Organizational Overview

Tab Four:

Organizational Overview

Introduction

Veolia understands that JEA is seeking approaches that will maximize customer, community, environmental and financial value over the long term. This is envisioned to be proposals that build upon JEA's strengths and seek to eliminate certain existing business constraints. That will require flexibility on the part of Veolia to help JEA achieve its vision of the future and provide a unique and valuable platform for growth.

That is an exciting opportunity and Veolia as the global leader in water and wastewater management is excited to respond. We can add significant value to unlock JEA's growth potential through focused on the water and wastewater system.

Veolia is proposing a solution that will assist in maximizing the value for JEA customers. Our objective in submitting this response to your request for Invitations to Negotiate is to detail the specific areas we can add value and propose a methodology to capture that value in the most beneficial and expeditious way to JEA.

1. Organizational Structure

The respondent for this proposal is **Veolia Water North American – South, LLC**.

This company entity was established as a separate limited liability company (LLC) in 2004, and is an authorized LLC in the State of Florida.

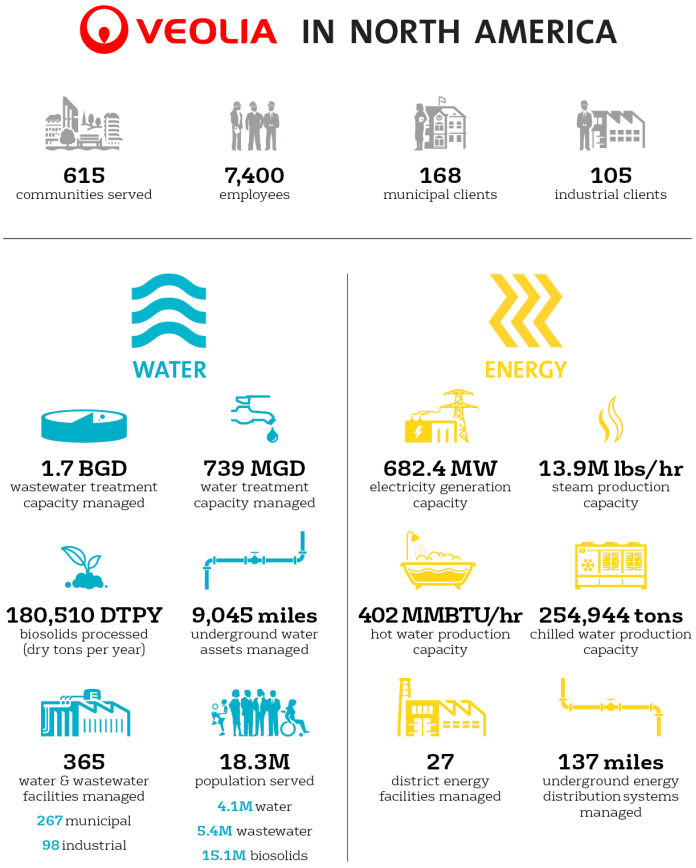
The company is a 100% subsidiary of **Veolia Water North America Operating Services, LLC**, an LLC that was established in 1986 under the laws of the State of Delaware. The company is also an authorized LLC in the State of Florida.

Both companies are 100% subsidiaries of **Veolia North America, Inc.**, which is a corporation under the laws of the State of Delaware, established 2017 and a subsidiary of **Veolia Environnement, S.A.**

Veolia Environnement is a French limited company and is publicly traded company in France. The company was first established in 1853 as Compagnie Générale des Eaux.

2. Operations Details

In 2008, in North America, Veolia manages 1.7 BGD of wastewater treatment capacity, 739 MGD of water treatment capacity and 682.4 MW of electricity generation capacity.



Veolia designs and provides water, waste and energy management solutions that contribute to the sustainable development of communities and industries. Through its three complementary business activities, Veolia helps to develop access to resources, preserve available resources, and to replenish them. This work involves supplying over 95 million people with drinking water and more than 63 million people with wastewater service, with other work in energy service (producing nearly 56 million megawatt hours of energy) and waste management (converting over 49 million metric tons of waste into new materials and energy).

The work of Veolia's global group covers the operation and management of some of the largest water and wastewater systems in the world, including:

- **Paris, France** - Syndicat des Eaux d'Ile de France (SEDIF) is the largest water authority in France and that agency's water operations have been managed by Veolia since its inception in 1962. The operations cover drinking water supply for 150 councils in the Paris suburbs and the Ile de France region. These systems supply more than 4.5 million inhabitants and include: three drinking water production facilities, as documented in the information sheet above, including the Choisy-le-Roi Plant (158.5-MGD), the Méry Sur Oise Plant (89.8-MGD), and the Neuilly Sur Marne/Noisy le Grand Plant (158.5-MGD); four bore field systems with a production capacity of 18-MGD; 48 secondary pumping stations; 69 water tanks; four raw water quality monitoring stations; 8,683 km of water distribution pipes; and 584,013 connections. SEDIF deals daily with strong challenges related to a highly urbanized service area, high population density and the strategic characteristics of many of its customers.
- **Prague, Czechoslovakia** - PVK is the first operation company in Czech Republic, providing water services to the 1.5 million inhabitants of the City of Prague and more than 200,000 other inhabitants in the suburban areas. Veolia is in charge of managing the whole water cycle operations, treatment and distribution of drinking water, and the collection and treatment of wastewater, under a 27 year agreement. The assets and operations include: two water treatment plants with a total capacity 265.7-MGD; 3,527 km of water lines and 51 pump stations; 3,647 km of sewer line and 313 pump stations; 21 wastewater treatment plants serving 1.6 million, with the largest plant (Prague 6) having a treatment capacity of 159.8-MGD. That plant uses primary physical and chemical treatment, secondary biological treatment including nitrification, denitrification and sludge treatment by thermophilic digestion with biogas recovery and energy production. The contract also covers responsibility for customer service for over 1.3 million (112,156 connections).
- **Shenzhen, Guangdong Province, China** –Shenzhen is a major city in Southern China, located at the border with Hong Kong, and is designated by the Chinese Central Government as a major economic zone. As the area developed and the need for better services became more apparent, the municipality opened up a number of public utilities services to the private sector. This included a public bidding process for the water sector organized in 2003. Veolia, in association with Beijing Capital Group, was awarded the Shenzhen contract. Under the agreement, Veolia co-manages SZWG's water production and distribution, wastewater collection and treatment and all customer services for residents in Shenzhen for 50 years. Shenzhen is one of China's most important business hubs, and Veolia's contract covers the Shenzhen special economy zone (the city's business district), which currently totals more than 2.2 million people, who are served by more than 2,400 employees.

3. Financial Details

Veolia is one of the largest environmental firms in the world with $30.1 billion in 2018 revenue and over 171,000 employees worldwide. Over the past few years Veolia has steadily improved its operational performance and increased profitability.

For example, in 2018, EBITDA came to $3.9 billion, an increase of 7.3% at constant exchange rates. Cost savings totaled $347 million, which is on target with the $344 million we had set. The $775 million in current

net income represented a 14.7% rise at constant exchange rates and excluding capital gains. Lastly, our net financial debt fell below the $11.5 billion mark as expected and is therefore under control. 2018 saw a continuation of the solid growth already seen in our results over the past few financial years. Indeed, the pace even picked up resulting in higher growth.

For the past three financial years, our revenue has annually increased by 4% at constant exchange rates, EBITDA by 5% and current net income by 10%. This is proof that we are firmly set on a path of profitable and sustainable growth.

Veolia is looking to grow, invest and acquire operations that align with our water, waste and energy activities. Recently, Veolia acquired an energy consulting business (Enovity) as well as the majority of the municipal water and wastewater OM&M contracts of a major competitor (American Water.

4. Number of Current Electric and Water Customers

In the U.S., Veolia ranks as the largest and most successful contract operator, with over $2.6 billion in revenue in 2018 and operations and management responsibility for: 210 municipal wastewater treatment plants that treat over 1.7 billion gallons of flow each day to meet the needs of more than 5.4 million people; along with 89 municipal water treatment plants that supply potable water to more than 4.7 million people.

Additionally, Veolia has more than 20 years' experience with the ownership, operations and management of energy systems in the U.S. and today encompasses responsibility for 36 energy facilities in the U.S. that can generate: 116.7 MW of electricity at Veolia's district energy facilities; 69.7 MW of electricity at commercial facilities operated for universities, hospitals, office buildings and shopping centers; 496 MW of electricity at facilities operated in industrial environments.

5. Existence of Unions, if any, of which the Respondent's current employees are members and a brief history of past collective bargaining agreement negotiations with each union

Veolia has proven experience in effectively working within a labor environment, with a strong unionized workforce in North America, with a total of 49 active union contracts and more than 910 employees covered under these agreements.

Our firm maintains a clear commitment to working with all union and non-union employees at our water and wastewater operations, and we respect all existing labor agreements when we work to transition current staff and operations. We also have a corporate Labor Relations and Human Resources Manager, Michael Schnack, who will work as part of Transition team and then remain engaged over the course of the long-term contract to support both union and non-union staff at this project site.

Veolia's experience and success with labor relations has also resulted in no work stoppages and effective resolution of grievances at our operated experience.

When we transition a new project and staff, Veolia works to accommodate any existing labor (union) agreements, and negotiates in good faith with unions to transition those agreement, make changes as required and negotiate new agreements where needed. Once agreements are in place, the existing unionized workforce is transitioned to Veolia under the terms of the contract and union agreement.

In the past 10 years alone, Veolia has transitioned over 500 staff from municipal clients and other contract O&M providers, and this experience includes:

- **American Water – Commercial Acquisition** - In 2018, Veolia acquired the municipal and commercial operations and staff of American Water in North America. This included more than 22 projects and more than 70 personnel in North America. This included both union and non-union staff groups.
- **Milwaukee, Wisconsin (wastewater)** – 200+ union and non-union staff.

- **Jackson, Mississippi (wastewater)** – 44 union and non-union staff
- **Fulton County, GA** – 80+ staff under two separate wastewater O&M contracts:
  - In 2010, Fulton County awarded Veolia a $56 million O&M services contract to manage their North Area wastewater operations; a system serves the needs of over 200,000 people. At the start of this contract, Veolia transitioned more than 50 employees from the County and other private O&M services providers to form a unified team that would be responsible for the long-term delivery of services.
  - In 2017, Veolia was then awarded a companion project for Fulton County's South Area contract. That project involved the transition/transfer of over 25 staff from a previous private operator and other staff the County.

This base of work demonstrates Veolia's recent experience in successfully assimilating employees into our employment, effectively addressing labor relations, contractual and legal issues, personnel benefits, employee orientation and training.

That new project with the JEA represents an exciting opportunity and Veolia as the global leader in water and wastewater management is excited to respond.

We can add significant value to unlock JEA's growth potential through a wide range of innovations, some that you have already identified, focusing first on the water and wastewater system but also from the electric and chilled water systems.

6. Extent of Involvement in Economic Development Activities and any funding provided in communities where current service is provided

Veolia is actively engaged in working in more than 615 communities in North America, on water, wastewater, energy, waste management and other environmental contacts.

In that work, we are engaged in the identification, recruitment and use of local businesses. The value of services purchased and capital funds spent can have a dramatic impact on the creation of local businesses of all types.

Many of our current operations, like those in Milwaukee (Wastewater), New Orleans (Wastewater) and Fulton County, Georgia (Water and Wastewater), ask for a specifically focused program.

We certainly expect to do the same thing for the City of Jacksonville and the Northeast Florida area.

Tab 6 of this response provides details on the community engagement activities of Veolia under large water and wastewater programs.

For more than nine years Veolia managed the largest municipal O&M contract for a U.S. water system. Under that contact Veolia was able to set a new standard for outreach and the utilization of small and disadvantaged businesses. Veolia increased MBE and WBE participation from just 10% to nearly 35%, well exceeding the City's goals. This increase represented twice the level of commitment required by the City and five times more than the previous water system manager. We also kept over $250 million in the local economy, purchasing goods and services from local businesses.

Additionally we provide programs such as the Veolia Innovation Accelerator (VIA) which seeks out emerging companies and technology. VIA has fostered innovation by using water and wastewater facilities as a pilot test platform.

7. Other Relevant Information

Apart from O&M contracts for water and wastewater operation, Veolia has also helped clients reach their potential through a wide range of innovations, and some key examples of this include work with:

- **New York City -** Under a comprehensive five-year agreement that began in 2011, Veolia worked with the New York City Water Board, the Department of Environmental Protection (DEP) under the Operational Excellence (Opx) program. Under this contract Subject Matter Experts from Veolia's North American and global operations groups teamed with public-sector professionals from the DEP to identify opportunities to make improvements in every aspect of New York City's water and wastewater infrastructure. Veolia provided analytical and technical expertise to measure baseline performance and analyze the impacts of potential improvements.

  Working together Veolia and the DEP implemented individual improvement ideas, and the overall benefits are provided over $82 million in savings and improvement on an annual basis. Veolia's approach to staffing this effort with New York City centered on bringing a broad cross-section of resources, including 50 staff from Veolia projects in Berlin, London and Paris, as well as veteran management staff from some of Veolia's largest North America operations. Under this approach, teams of New York City employees worked with Veolia's team of operations, maintenance, engineering and management specialists to implement more than 90 selected efficiencies. (Tab 7 provides a summary report for that program that discusses the approaches used and the results achieved.)

- **Managing Climate Change at the Local Level** - Veolia has also responded to the disruptive forces facing communities across the country and the globe. That work included resiliency studies for the communities of Milwaukee, Wisconsin, and New Orleans, Louisiana. The work at Milwaukee involved conducting an analysis of the risks and challenges facing this region, a prioritization exercise during workshops conducted with the 28 municipalities constituting the "Milwaukee Metropolitan Area" as well as a panel of stakeholders with vested interest in the process to outline a regional action plan for territorial actors. The resilience plan identified 20 actions chosen by stakeholders, grouped into three vision categories, and focus areas in-line with the 100 Resilient Cities focus areas. (Copies of these studies for Milwaukee and New Orleans are provided as Attachments to Tab 7 of this submittal).

TAB 5

Process Goals

Tab Five:

Process Goals

1. Greater than $3 billion of value to the City of Jacksonville

Veolia understands that the JEA is seeking approaches that will maximize customer, community, environmental, and financial value over the long term.

This is envisioned to be proposals that build upon JEA's strengths and seek to eliminate certain existing business constraints.

The electric system makes up a sizable portion of the total utility, but efficient water and wastewater operations, maintenance and management (O&M) will be needed to help generate savings to pay for the portion of the value associated with the water and wastewater assets. Energy utility owners, pure investors or concession financiers often do not have the skill set to extract this component on their own or risk compromising levels of service.

The acquisition of the utility in whichever Strategic Alternative is selected will potentially bring increased interest costs as municipal debt is exchanged for higher rate non-municipal debt and return on equity and debt and equity amounts increase. The core value of the present utility will be optimized by delivering the same or better level of service at a lower O&M cost.

These savings will allow for a greater acquisition price and can contribute to supporting the debt, or both.

While a financial partner will need to be the lead in terms of providing direct monetary value to the City of Jacksonville, many of the service-related value offerings will require technical capabilities that only Veolia and a few other firms can provide.

For example, JEA is also seeking the strategic flexibility to achieve its vision of the future and provide a valuable platform for growth.

The financial partner will want to maximize its investment. This would, as outlined in your ITN, involve leveraging your existing utility and operations platform to unlock growth potential in areas including:

1 - Front-of-the-Meter Innovations – Focusing on assisting JEA in expanding on your current business model to offer products, services and programs that hold the potential to enhance the value of the existing utility business while offering high-value enhancements in product offerings and resiliency to JEA's customers. That's been done for our client in Milwaukee, Wisconsin, where energy production and fertilizer are created as part of overall wastewater O&M responsibility.

2 - Behind-the-Meter Innovations – The customer service aspects of the water business are in their infancy. Veolia has been creating new options in Europe with its Home Rider system that provides valuable information to customers on their water use, services like back up alarms in the basement and even garbage pickup monitoring. Additionally, several of our clients are now using service line insurance as a protection against leaks. The options are unlimited for different access to the customer through the water meter.

3 - Geographic Growth Opportunities – This would focus on leveraging JEA's core operating capabilities to generate new revenue streams by providing cost-effective management and general services to other utilities, while at the same time creating significant value for customers. Veolia's client in the Borough of Naugatuck, Connecticut, does that now by providing merchant biosolids handling for other communities by

utilizing the excess capacity in its biosolids incinerator and subsidizing other operations. Today the Naugatuck plant processes biosolids from 60 other communities.

4 - Innovation beyond Energy and Water – Veolia's focus will be on the water and wastewater business. But that is becoming more complex with the creation of fertilizer products from biosolids like, and the energy production options are becoming more creative with the use of digester gas, in line generation from discharge pipe. There is also the new utility requirement related to stormwater, which many wastewater utilities are bringing together for economy of scale and water reuse. All of these can be new sources of revenue and a benefit to the Northeast Florida community.

The core approach in these areas would focus on removing the existing governmental constraints and incorporating strategic revenue growth opportunities in order to maximize customer, community, environmental, and financial value across its service territory.

Veolia began working with the Borough of Naugatuck, CT, in 2001, under an interim wastewater facilities O&M agreement that was expanded to a 20-year design/build/operate (DBO) agreement that covered the upgrade and expansion of the wastewater plant and implementation of a regional and merchant biosolids dewatering and incineration operation. Collectively, these facilities, which are located on the same site and comprehensively integrated with each other, are referred to as the Water Pollution Control Facility (WPCF). Veolia's merchant biosolids program at Naugatuck now addresses the needs of the Borough's wastewater plant and generates revenue by processing biosolids from 60 other communities. The merchant biosolids operations functions 24/7, with an average 95% processing uptime that achieves world-class benchmarks for solids incineration.

That is an exciting opportunity and Veolia as the global leader in water and wastewater management is excited to respond. Veolia is proposing a solution that will assist in maximizing the Customer, Community, Environment and Finance value for citizens.

Our objective in submitting this response to your request for Invitations to Negotiate is to detail the specific areas we can add value and propose a methodology to capture that value in the most beneficial and expeditious way to JEA.

2. Greater than $400 million of Value Distributed to Customers ($350+ paid to each JEA account; $1,400+ for customers with electric, water, sewer and irrigation accounts)

This would be part of a larger financial package by the ultimate owner (likely a financial institution/investor) of the system.

Veolia would provide the efficiency required to help generate savings to contribute the $350 per utility per customer in the water and sewer service.

3. At least Three Years of Contractually Guaranteed Base Rate Stability for Customers

The request for three years of rate stability can clearly be accomplished within a purchase or concession approach. The rate deferral, however, may decrease the enterprise value or result in larger rate increase after the hold-out period. Again, lowered O&M cost can help negate these impacts making rate stability more viable. Beyond the initial stay out period, O&M cost containment and prudent capital decision, execution and management are key to minimize future rate needs. Veolia brings these skills, proven at our clients across the country.

Veolia brings municipalities improved management and use of technology to help manage the keep rates stable over the first three years of the contract.

Veolia has demonstrated this at our long-term water operations at the City of Indianapolis, Indiana, where we provided a 350,000-customer water system (similar in size to JEA) with a three-year rate freeze.

That same type of impact can be made at the JEA.

4. Commitment to Develop and Provide the City of Jacksonville and the Duval County Public School System 100% Renewable Electricity by the year 2030

While this commitment will need to be made by the lead Financial Partner (and eventual asset owner,) Veolia works with its clients to phase-in capital improvements and operational strategies to conserve and generate renewable electricity. A frequent focus is on using wastewater biosolids as a source of renewable energy.

Veolia combines our company's expertise in wastewater with its energy expertise to increase biogas production through co-digestion, high strength waste (including fats, oils and grease) and wastewater treatment process improvements. We then can provide critical uptime guarantees for energy recovery systems such as turbines, dryers and other specialized equipment, thanks to our expertise with these technologies and our industry-leading asset management program.

The interest by the JEA in solar is an additional option for the wastewater facilities. Seen in some locations in the northeast and west, this is becoming a source of reliable energy for water and wastewater utilities. That alternative will be explored more fully at JEA.

Veolia has had extensive use in minimizing the amount of power used in treatment and pumping operations. A proprietary model is used to evaluate plants for the most efficient operating scenario. Our in-house energy-efficiency consulting experts can also focus their efforts on detailed tracking of energy usage and minimizing the use of energy through management, conservation and efficiency improvements.

A good example of this is our Milwaukee, Wisconsin, wastewater project where we helped our client implement a landfill-to-energy project, which supplements digester gas to greatly reduce the need to purchase electricity from the grid for a very large wastewater operation.

5. Commitment to Develop and Provide 40 MGD of Alternative Water Capacity for Northeast Florida by the year 2035

Veolia will explore and develop alternative water options for the utility. This can include helping with the existing pilot projects for water reuse, evaluating surface water, brackish water and sea water options. Veolia is involved in a wide range of alternatives across the country. This can also include working with local industry to minimize their water use or to increase recycle inside the factory.

Veolia for example assisted Toledo Refining, a petrochemical facility, in recycling 50% of its wastewater. Additionally, here in Florida, we provided construction management for the installation of an innovative Class V Aquifer Storage and Recovery (ASR) at **Palmetto** (profiled opposite), which is now part of the wastewater plant operations.

In addition, **Tampa Bay Water**'s 120-MGD surface water treatment plant was built by Veolia under a design/build/operate (DBO) framework in 2000 (66-MGD initial capacity) and then expanded under a CMAR process. This plant serves over

In 2015 Veolia completed a capital upgrade contract at Palmetto for construction management, startup and now O&M services for a new Class V ASR Test Well Pumping and Treatment System, Aquifer Storage and Recovery. The ARS allows the City's treatment plant to inject excess reclaimed water during wet seasons into the ground for storage, which then can be withdrawn to use during higher demand and drier seasons. The work was coordinated by our O&M team at and managed by our regional CPM group.

2.5 million people in a three-county area, including the cities of Tampa and St. Petersburg, along with major universities in the area (the University of South Florida and the University of Tampa). Veolia's DBO work was recognized with numerous awards, including the 2003 Infrastructure Award from the National Council for Public-Private Partnerships and the 2003 Grand Prize-Design award from the American Academy of Environmental Engineers. In 2007, Veolia's contract with Tampa Bay Water was expanded to double the size of this facility to a maximum capacity of 120-MGD. The DBO process provided Tampa Bay Water with performance guarantees for water quality, water quantity, construction timelines and a guaranteed not-to-exceed price for project delivery.

6. Protection of Certain Employee Retirement Benefits

We applaud the effort by the JEA to protect the employees and the benefits they have built up over the years. Veolia has completed the successful transition of municipal employees both union and non-union, including 450 employees at Indianapolis (Water) and 200 employees at Milwaukee (Wastewater).

Our work also includes experience with a broad range of Labor Organizations and CBAs. Transition involves a detailed assessment of the employee package and any financial negotiations with the eventual owner and the strategic alternative selected.

The discussion by JEA and the City regarding the pension program is certainly something that has to be evaluated in finalizing any commitment regarding benefits. Our standard benefits provide a competitive wage and benefit package.

7. Maintenance of Substantially Comparable Employee Compensation and Benefits for three years

For water and wastewater treatment staff, Veolia typically offers competitive employee compensation and benefits.

Our compensation package is designed to retain talented staff, and Veolia provides a range of incentives for water and wastewater staff to improve their certifications as well as educational opportunities and scholarships.

Additionally, by joining one of the world's largest water and wastewater firms, current JEA staff would give themselves an opportunity to expand their career beyond Jacksonville, with new internal Veolia positions posted regularly for roles in the U.S. and abroad.

8. Retention Payments to all Full-time Employees of 100% current base compensation

Veolia agrees with the idea of payment of retention bonuses to the employees.

Retaining the expertise of current staff is critical to a successful transition of operating responsibility.

The efficient operation of the utility will provide the funding needed in the transaction to provide those payments.

Veolia's projects at Indianapolis (Water) and Milwaukee (Wastewater) are representative of our approach to successful transition and retention for large-scale operations such as yours.

While this commitment will need to be made by the lead Financial Partner (and eventual asset owner), Veolia will be focused on the efficient operation of the water and wastewater so they will contribute to the financial package.

9. Commitment to New Headquarters and employees in downtown Jacksonville, contributing to the economic development of the community.

The lead of any project will be the actions of the new owner and primarily the electrical system. But Veolia would be committed to renting space in a new building for the water and sewer systems.

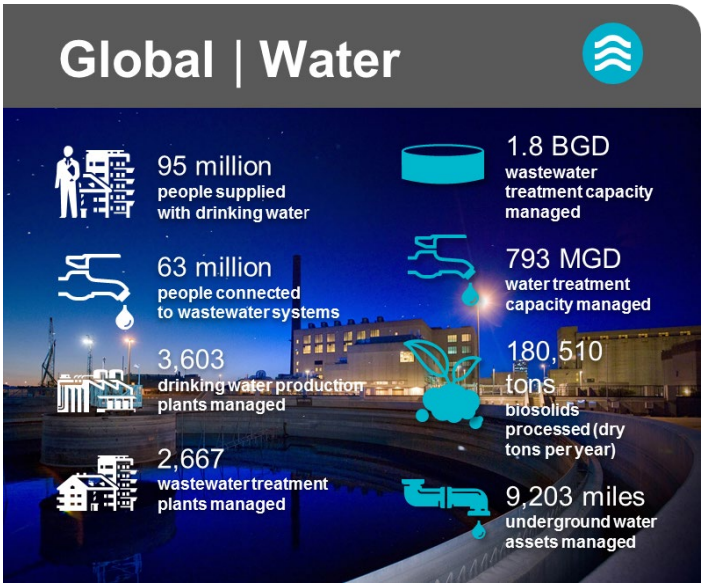
TAB 6

Response to Evaluation Criteria

Tab Six:

Response to Evaluation Criteria

1. Proposal to Achieve JEA's Goals in this ITN



Veolia is committed to meeting the goals set by JEA under this Invitation to Negotiate (ITN) process. In the response that your agency will receive to the ITN, JEA will likely find respondents interested in utility acquisition, concession or investors without operations. Respondents are likely to have significant energy OM&M experience but not comparable water and wastewater experience.

Veolia's intended role under any service structure that results from this process would be to provide the operations, maintenance and management (O&M) of the water and wastewater. Our commitment, as we have discussed in this response, would be to work with any investor or company that ultimately controls the utility regardless of which ever strategic option is selected. Therefore, in order to respect the process laid out by the JEA, we have not approached these potential respondents directly and would seek out teaming as the process moves forward.

Veolia, as outlined in the summary graphic (above), is a global leader in the water and wastewater industry, and some examples of the types of benefits that our firm can offer as an O&M provider for your water and wastewater utilities include:

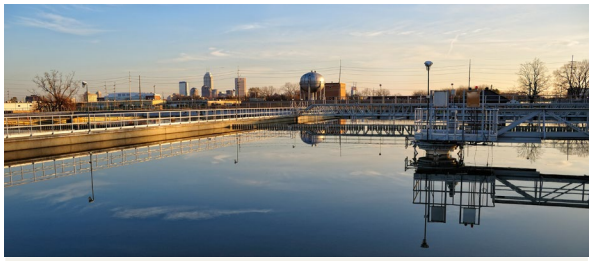
- **$3 billion or Greater Value** - Veolia as the O&M provider for water and wastewater would increase the value of a financial transaction from optimized operations and controlling cost. The acquisition will potentially bring increased interest costs as: a) municipal debt is exchanged for higher rate non-municipal debt return on equity, and b) debt and equity amounts increase. The core value of the present utility will be optimized by delivering the same or better level of service at a lower OM&M cost. These savings allow for greater acquisition price, can contribute to supporting the debt, or both. Veolia delivers this core competency across our customers.

  Examples can be found in the Veolia Capabilities and Results and Advantage sections of this response, and we would seek partners from respondents where our skills can work to increase the financial offer. Further, Veolia would look to exploit opportunities to expand the service territory or services offered in water and sewer potentially creating further value.

  Our firm's successful participation in acquisitions, concessions and other teaming relationships – as documented in the project examples presented in Section 3 of this response -- demonstrates our firm's ability to provide that value.

- **Commitment to $350 for Water, Sewer and Reuse** - Innovation, optimized organization, adopting industry-leading best practices and incorporating cutting-edge technology will all contribute to this commitment by reducing and controlling operating costs as part of a larger transaction.
- **Thee-Year Rate Stability** – Near-term rate stabilization without O&M reductions can bring greater future rate impacts since current revenue is not adequate to recover operating expenses and new debt and equity service. Shortfalls in rate recovery would require further short-term borrowing expense. Investors will ultimately seek recovery and return on all these costs. Maximizing asset value with near-term rate control and minimal future rate increase requires efficient O&M, and ideally reductions from present costs.

  Veolia has provided this type of guarantee before in Indianapolis Water, as profiled opposite, which provided service to water customers in and around that City – a service area encompassing almost a million people in Central Indiana.
- **Renewable Energy** - Veolia would support this objective as it relates to the water and wastewater facilities which may contribute to the overall goal.



For almost a decade Veolia managed an innovative water operations partnership with the **City of Indianapolis, IN**; delivering a transition approach that changed the management and operation of the City's water department. Veolia's management team achieved significant cost savings, organizational and operational improvements, technological advancements and management efficiencies. The Indianapolis water system is comprised of four surface water treatment plants (16-MGD to 96-MGD), five groundwater treatment plants (2-MGD to 24-MGD), a 4,300-mile distribution system, 29 water pump stations and multiple surface reservoirs and storage tanks. The Indianapolis water supply system also has multiple water pressure zones, with 15 districts and five sub-districts.

Veolia also initiated a new standard for water utility operations and service excellence at Indianapolis, completing the rigorous program for ISO 9001 and 14001 standards. This made Indianapolis the only major city in the U.S. that had achieved these standards for its water operations, and Veolia Water Indianapolis the first U.S. water company to be simultaneously certified in both.

Veolia's in-house, energy-efficiency consultants focus their efforts on detailed tracking of energy usage and minimizing the use of energy through management, conservation and efficiency improvements. At our wastewater operations in **Milwaukee, Wisconsin**, Veolia combined digester gas and landfill gas to generate onsite a portion of the power needs for a very large wastewater plant.

Veolia conceived the project while fulfilling our role in a larger O&M contract that includes operation of two large wastewater treatment facilities (630-MGD total). We supported the Milwaukee Metropolitan Sewerage District (MMSD) in the implementation of this complicated project and integrated the operations of the metering and generation facilities under our overall O&M agreement to maximize the value of this new renewable energy generation facility. The Jones Island renewable energy facility includes: landfill gas collection, gas conditioning, long gas pipeline conveyance system, a gas metering station, electricity generation facilities that serve wastewater treatment plants electrical loads, and waste heat-recovery systems utilized to produce a Class A marketable fertilizer.

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT
Wisconsin

Veolia helped delivered on our promise to achieve $27 million in annual O&M savings, and we have identified and implemented additonal innovations – such as the landfill-gas-to-energy project – which are further benefiting MMSD.

Contract Duration: 2008-2025
Capacity: 630 MGD

- **40-MGD of Alternative Water Capacity** - Veolia brings substantial experience in this area as an operator, maintainer and equipment supplier as well as through design/build/operate (DBO) of systems that use alternative sources (reuse, desalination, brackish water and industrial treatment). We would partner to explore and develop the most practical alternative for water whether conservation, reuse, surface water, seawater or storm water. This will include continuing the pilot programs already started for exploring

options. At Tampa Bay Water here in Florida, Veolia provided the DBO of a then new 60-MGD surface water plant in 2000 – saving that agency a projected $85 million over the life cycle of the facility.

Veolia is also experienced in working with our commercial and industrial clients in reducing industrial water demand. This has included working with industrial customers like the Toledo Refinery in Ohio where we recycle 50% of their wastewater back into the plant reducing demand on city water supplies.

- **Employee Benefits and Three Years of Comparable Compensation and Benefits** - Veolia has completed the successful transition of municipal employees both union and non-union. This includes more than 450 employees at Indianapolis and over 200 employees at Milwaukee where multiple unions were involved. These transition processes involved a detailed assessment of employee benefits packages and any financial negotiations with the eventual owner and the strategic alternative selected.

  Veolia's standard benefits provide a competitive wage and benefit package, and our company works with a broad range of Labor Organizations with CBAs in place across the country.

  - Retention Payments - The improved operations of the water and wastewater will contribute to the financial package offered by the eventual investor or company who owns JEA. This will help to assure payment of the retention payments. As JEA clarified the funding for this will ultimate come from sale proceeds.

In the past more than 10 years Veolia has transitioned over 500 staff from municipal clients and other contract O&M providers:

- Large-scale operations, including:
  - **Milwaukee, Wisconsin** (wastewater) – 200+ union and non-union staff
  - **Jackson, Mississippi** (wastewater) – 44 union and non-union staff
  - **Fulton County, GA** – 80+ staff under two separate wastewater OM&M contracts:
    - In 2010, Fulton County awarded Veolia a $56 million O&M services contract to manage their North Area wastewater operations; a system serves the needs of over 200,000 people. At the start of this contract, Veolia transitioned more than 50 employees from the County and other private O&M services providers to form a unified team that would be responsible for the long-term delivery of services.
    - In 2017, Veolia was then awarded a companion project for Fulton County's South Area contract. That project involved the transition/transfer of over 25 staff from a previous private operator and other staff the County.

- **Commitment to New Headquarters and Economic Development** - Working with the eventual owner of the utility, Veolia will commit to the necessary office space commensurate with its scope and compensation, and our company has made similar commitments in the past.

2. Experience and Customer Commitment

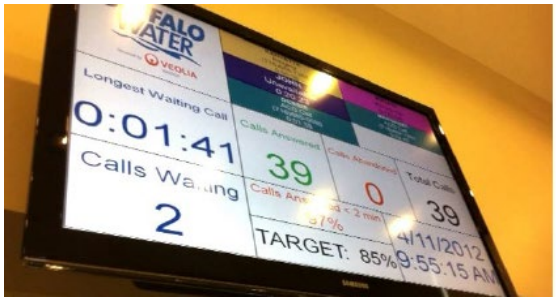
Longevity of utility generation, transmission, and distribution operations greater than 5 years

As the O&M provider, lowering costs and controlling them over the long term is the value that Veolia can bring to customers – as the graph (opposite) illustrates, Veolia delivered consistent savings to the City of Indianapolis, Indiana, under what was at the time the largest municipal water system under a contract O&M agreement – delivering some $18 million in savings over the almost 10 years of that contract.

Our approach is to control costs for the water and sewer system, and this can include upfront savings, or it can be in annual cost increases which match the CPI. The overall impact is a reduction in cost and long term control of costs. The resulting savings can be used by the owner of the systems to contribute to the City through annual payments, a downtown office building or other arrangement.

The success of Veolia's approach is demonstrated in our work as the largest O&M provider for water and wastewater in North America, with multiple contracts of that have been in place 20, 30 and even 40 years.

Successful customer relations demonstrated through customer outreach, surveys such as JD Power or other comparable sources



Veolia pioneered key performance indicator (KPI) based pay in under water and wastewater O&M contracts in the U.S. Veolia implemented customer service phone information systems, and in our partnership at **Buffalo, New York**, we worked to develop a customer-responsive organization. That ongoing project ranks as the largest water system under contract O&M in New York State, and Veolia is responsible for managing the day-to-day operations, maintenance and repair of the water systems of the treatment, pumping and distribution facilities.

Under that contract Veolia implemented new customer service phone/information systems and developed an improved customer service organization. That included re-engineering customer service at Buffalo to speed up call answering, improve performance and increase field visit timeliness. The use of metrics by Veolia was assured through the innovative communications with customers, customer surveys, advisory groups and community participation. All of this designed to provide an open and transparent utility to the community and employees in the form of regular reports about performance. By restructuring billing cycles, call center activity was leveled, which allows us to operate with fewer staff enabling reassignment to provide additional services. Veolia also established 20 key performance indicators (KPIs) to track and determine performance and accountability under this partnership, and we are exceeding all client customer service, billing and revenue performance standards.

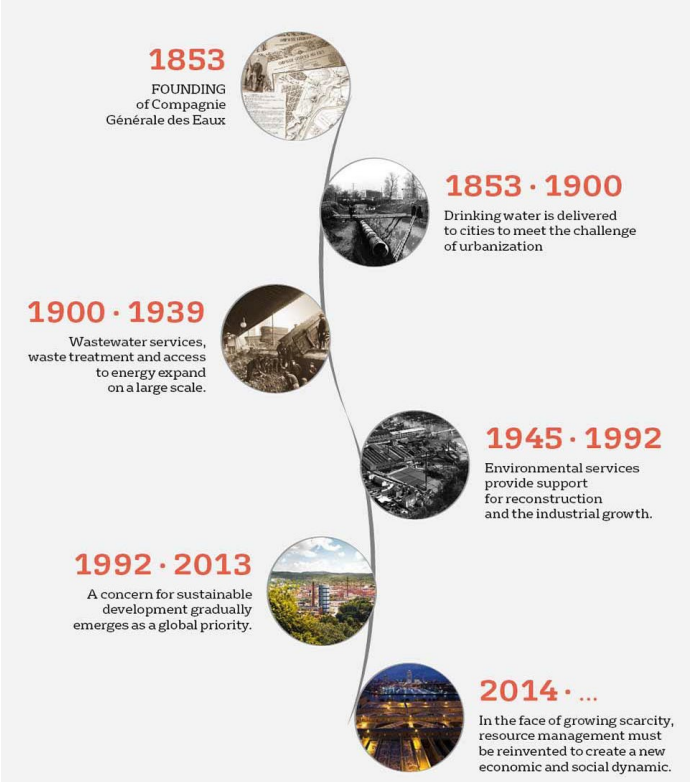
Corporate culture demonstrating a long-term commitment to operations

For more than 166 years globally, Veolia has provided local authorities and industries with the water management, waste-management and energy services vital to human development and sustainable performance.

Our company's commitment to deliver water and wastewater utility services – as tracked on the timeline (opposite) – has focused on providing compliant, dependable and affordable operations and management services backed by continued investment of millions of dollars in water research and development, as well as decades of practical operations and maintenance experience at thousands of facilities around the world.

In the U.S., Veolia has continuously operated contracts for nearly 50 years. Long-running projects that Veolia currently operates and has earned renewals/extensions include:

- **47 years** - Burlingame, CA
- **42 years** - Great Falls, MT
- **39 years** - Poughkeepsie, NY



- **36 years** - Leominster, MA
- **35 years** - Auburn, AL
- **35 years** - Southbridge, MA

Strong focus on maintaining reliability and minimizing time of disruptions

Veolia understand that a large problem facing the City of Jacksonville and the JEA is the changing climate situation. Rising sea levels and stronger hurricanes present and ever increasing threat.

Veolia has been engaged first-hand with the impact of hurricanes, and we have worked with communities such as the **City of New Orleans, Louisiana**, to address those threats and to plan for the future. Tab 7 of this submittal includes a copy of the Resiliency Report for this operation.

New Orleans - Hurricane impacts at the wastewater plants.

When hurricanes Katrina and Rita devastated the Gulf Coast and the City's East Bank wastewater plant was completely submerged under 22 feet of floodwaters. One month after the disaster struck, the East Bank plant had been completely dewatered, and two weeks later, 30 million gallons of water was flowing through the facility. Meanwhile, the U.S. Environmental Protection Agency (U.S. EPA) imposed a 60-day deadline to restore secondary treatment capabilities, Veolia successfully met the regulatory agency's goal with one week to spare. Out of $54.5 million in available funding to restore the New Orleans wastewater treatment facilities, Veolia completed some $47 million in hurricane recovery work, applying Federal funds to the maximum benefit of the affected facilities and the City of New Orleans. We directly coordinated projects with the Federal Emergency Management Agency (FEMA) as an agent for the City, providing damage estimates, defining scopes, cost estimates and work justifications.

Most recently, Veolia, in collaboration with Swiss Re and the City of New Orleans collaborated on the Building a More Resilient New Orleans study and report. This study looked at the impacts of Hurricane Katrina and identified approaches for the City to use in protecting itself against similar events and/or any other chronic stress or shock. As noted in this report, the City had set itself the priority of improving its understanding of exposure to risks and transforming its urban system. Resilience requires global risk management, combining physical and financial protection. This was the focal point of the risk assessment plan implemented by Veolia, Swiss Re and New Orleans, in the context of the first international public-private partnership on resilience. This partnership focused on optimizing prevention costs and reducing post-event losses, as well as the recovery period after a shock. For a period of four months some 30 Veolia and Swiss Re experts, in coordination with stakeholders in the City, examined 200 drinking water, sanitation and rainwater evacuation facilities in the City in order to determine their degree of vulnerability and recommend the

appropriate action to ensure these facilities are able to resist a shock. The results were documented in the report, which is provided with Section 7 (Attachment 7-3) of this submittal.

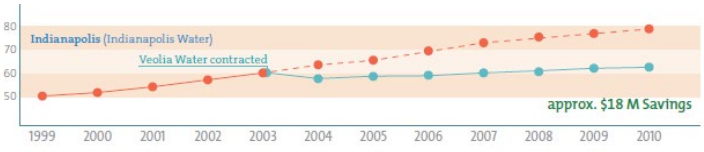
That same type of assistance could be useful for JEA in regards to your water and wastewater.

Focus on maintaining rate stability for customers, as illustrated through historical rates

Veolia has traditionally provided the O&M services to cities being a part of the overall operations and cost of the utility. As such Veolia has not managed the customer rates but been a part of helping to keep rates low. To do that, Veolia is proud of the savings we have delivered for large utilities under long-term O&M agreements with **Tampa Bay Water, Florida**, Milwaukee, Wisconsin and New Orleans, Louisiana.

We have also been engaged in large operations optimization programs working with some of the largest water and wastewater utilities in the U.S., including:

- **New York, New York** - Under a comprehensive five-year agreement that began in 2011, Veolia worked with the New York City Water Board, the Department of Environmental Protection (DEP) under the Operational Excellence (OpX) program. The work under this contract involved mobilizing Subject Matter Experts from Veolia's North American and global operations groups and then teaming those resources with public-sector professionals from the DEP. These working teams focused on identifying opportunities to make improvements in every aspect of New York City's water and wastewater infrastructure. Experts from Veolia provided the analytical and technical expertise needed to measure baseline performance and to analyze the impacts of potential improvements. Working together Veolia and the DEP implemented individual improvement ideas, and the overall benefits achieved were over $82 million in annual savings and improvements. Under this approach, teams of New York City employees worked with Veolia's team of operations, maintenance, engineering and management specialists to implement more than 90 selected efficiencies. Attachment 7-1, Tab 7, presents a copy of the final report for the Operational Excellence program, which provides further information on this program.
- **Washington, DC** - Veolia worked with the District of Columbia Water and Sewer Authority (DC Water) on a study of its largest wholesale customer of the Washington Aqueduct (Aqueduct). This water system, with a 240-MGD surface water treatment plant, 150-MGD surface water treatment plant and 10,000-ton/year residuals management facility, serves the needs of more than 1.1 million people in a service area that covers Washington, DC, and the surrounding area. The Aqueduct is a federally-owned public water supplier operated by the U.S. Army Corps of Engineers and DC Water's goal was to conduct a comprehensive evaluation of the Aqueduct's operations and related organization processes and then recommend improvements that add value to the delivery of services to its wholesale customers. Working in collaboration with Aqueduct staff, experts from Veolia reviewed every aspect of the Aqueduct's operations, including the treatment process, maintenance and all support functions. Some 25 individual improvement ideas were identified and thoroughly evaluated during study phase, and up to 15% in savings were identified by Veolia's team at the Aqueduct. Veolia prepared a comprehensive report to the DC Water on the results of the study and then helped to implement initiatives to improve the operations, and a copy of that report is provided at the end of this section with Tab 7, Attachment 7-4.



Additionally, in our work with the City of Indianapolis, Indiana (discussed earlier), Veolia provided a three year rate freeze for customers initially and then over the life of the contract worked to control and reduce costs, providing long term savings to that client; with $18 million in savings over the almost 10-year term of the agreement as the summary table (above) serves to document).

3. Economic Development and Benefits to Jacksonville

Veolia maintains a strong commitment to providing opportunities for small and disadvantaged businesses in all aspects of our work.

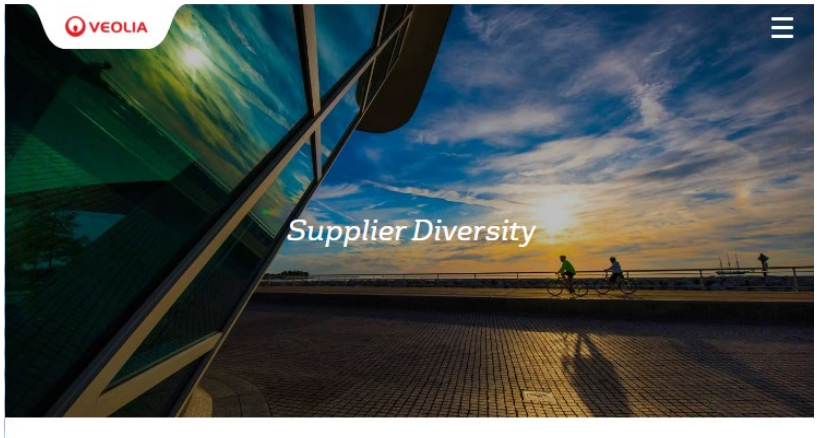
We are also actively engaged in working in more than 615 communities in North America, on water, wastewater, energy, waste management and other environmental contacts. In that work, both for new projects and existing operations, we are engaged in the identification, recruitment and use of all classes of small and disadvantaged businesses.

We identify small and disadvantaged businesses firms for specific opportunities using:

- Veolia's Supplier Diversity Program database of small and small disadvantaged businesses.
- The U.S. SBA Small Business Dynamic Search Website.
- The resources of the National Minority Supplier Development Council (NMSDC).
- Participation in local professional organizations promoting small business utilization.

Veolia also maintains a strong commitment to diversity and outreach at the corporate level, and in recent years our firm has maintained a focus on developing a cohesive strategy for supporting Diversity & Inclusion. This has included an effort to expand project procurement awards with local small businesses to support the communities in which we work and live through a robust Supplier Diversity program, mentor-protégé relationships, joint ventures, community relations and a strong commitment to local partners.

Additionally, Veolia's Corporate Procurement, Business Development and Human Resources groups are charged with developing and driving inclusion, diversity and innovative strategies in terms of our firm's hiring and subcontracting practices – reflecting the commitment of our company to the basic approaches outlined in our corporate Diversity & Inclusion charter.



Veolia Milwaukee recognizes supplier diversity as a proactive business initiative which supports our business strategies and values. Through our company policy and as a normal part of doing business, we offer small, veteran, minority, and women business enterprises (SWMBE) the opportunity to compete in the procurement process on an equal basis with all business enterprises.

Veolia Milwaukee believes that supplier diversity directly supports our strategy and values. Strengthening the minority business community economically contributes to the vitality and overall economic growth of our community, thereby making our community a better place to live. Therefore, is it our company-wide policy to offer minority owned businesses an opportunity to compete on an equal basis with all other bidders.

Procurement contact:
Barbara Brown
barbara.brown2@veolia.com
414.747.3852

Click here to learn more about how we work hand-in-hand with MMSD's minority business capacity-building program.

Veolia's Supplier Diversity Program has a national focus and is targeted at building and maintaining a vendor database to allow the company to meet all project needs by drawing from a diverse pool of prequalified subcontractors and ensuring the widest possible participation opportunity to all small and small disadvantaged businesses. We also establish local programs under large contracts, such as that with the MMSD in Milwaukee, Wisconsin. Those types of efforts have included local recruitment using dedicated website (illustrated above), local job fairs, and other ongoing awareness and recruitment efforts with local firms.

Specialized Recruitment, Tracking and Reporting Approaches

For a large project like JEA, Veolia establishes project specific sites where interested companies can register as potential subcontractors. These project and operations specific sites are used to support outreach and procurement efforts under large Contracts. One example of this (as shown on the previous page) is the website established and maintained for our wastewater contract at Milwaukee.

Past Performance

Veolia, in our work with government clients at the local, state and federal levels, has a long-term, proven record providing subcontracting opportunities for local, small and disadvantaged businesses. The following projects demonstrate Veolia's commitment and past and current performance utilizing small and small disadvantaged businesses to meet and exceed small business goals:

Veolia has an ongoing commitment to developing and driving Inclusion, Diversity and Innovations strategies in our hiring and subcontracting practices. Our proactive approach, using in-house tools and resources combined with active partnerships with advocacy agencies, achieves significant results in the area of small and disadvantaged project involvement. This work was recognized when Veolia's Milwaukee Metropolitan Sewerage District Project Manager received a commendation during "Small Business Week" for our small business outreach.

- **MMSD, Milwaukee, Wisconsin** – Under our wastewater, sanitary and stormwater collection and biosolids operations O&M services contract with MMSD, Veolia provides meaningful programs to strengthen the local small business community. Veolia's MMSD contract is the largest ongoing U.S. wastewater O&M partnership, providing wastewater treatment and flood management for 28 communities in the Greater Milwaukee area. To ensure support to local small businesses, we established a robust small, woman-owned (WBE) and minority-owned (MBE) Business Program and began an annual local Supplier Symposium coupled with an online vendor registration, adding 150 new suppliers to our active supplier database. As part of our outreach efforts, we established an active supplier development advisory committee which holds quarterly meetings with local small businesses. These efforts have allowed us to exceed contract goals by over 16%, with total small business participation of $4.09 million, and we continue to work to increase small business contracting spending year after year.
- **Fulton County, Georgia: Two Wastewater O&M Contracts**
  - North Area Operations - In July 2010, Fulton County awarded Veolia a $56 million O&M contract to manage its wastewater facilities that serve more than 200,000 people in the north area of the County. Veolia's initial small and small disadvantaged business outreach program included 17 subcontractors and vendors. Veolia's self-directed project goals provide for 12.7% involvement by minority owned firms and 13% involvement by woman owned firms (with an overall program of small and disadvantaged program involvement level of 25.7%, which exceeds the County's goals).
  - South Area (Camp Creek) Wastewater Operations - Veolia was selected as the O&M provider for Fulton County's companion system in 2016 under a new 10-year agreement. The new contract covers O&M responsibility for the 24-MGD Camp Creek Water Reclamation Facility, associated pump stations and the County's Maintenance facility. Veolia performed an outreach process as part of the Proposal development and identified a group of eight small, woman-owned and minority-owned firms. These firms were proposed as part of Veolia's team for this contract, providing a small and

disadvantaged program involvement level of 19.68%, which exceeds the County's goals for this contract.

- **Atlanta-Fulton County, Georgia** – Veolia provides O&M services to a 90-MGD surface water treatment plant, jointly owned by the City of Atlanta and Fulton County. Under this contract, our firm has utilized small, disadvantaged and woman-owned small businesses within our team for more than 25 years at participation levels that have exceeded 25% of our annual O&M fee value. More than two decades ago, Veolia implemented a mentor-protégé program for firms in Fulton County and the City of Atlanta. In 2010, we significantly expanded this participation program by including these same key partners in our Fulton County wastewater O&M contract. Under our most recent (2014) renewal of the Atlanta-Fulton County water contract, we increased our commitment to these partner firms to nearly 29% of a $4 million annual fee.
- **New Orleans, Louisiana** – In 1992, Veolia began a long-term O&M partnership with the Sewerage & Water Board of New Orleans for its wastewater facilities. Over 25 years, we have routinely met or exceeded our goal of providing 30% of our base budget to small and small disadvantaged businesses in the New Orleans area, including our extensive work in the recovery from the damage caused by hurricanes Katrina and Rita. In 2005, Veolia's spent 42% of our budget with City-certified (and other certified) MBE and WBE firms, keeping nearly $4 million in the local community. Additionally, two of our local small business partners have grown into large, stable businesses providing jobs for the local community. In 2014, Veolia's O&M partnership in New Orleans was renewed for a 10-year term based on our firm's strong record of performance. In this forward-going, long-term O&M services contract, Veolia is committed to exceeding the DBE minimum requirement of 30% of our base budget by utilizing a team of 14 local firms – an outreach effort valued at more than $3 million per year.
- **City of Indianapolis, Indiana** - From 2002 to 2011, Veolia operated the Indianapolis regional water system, serving the needs of almost one million people in central Indiana. The size and demands of this contract required a significant subcontracting program, and over the course of this agreement Veolia increased MBE and WBE participation from just 10% to nearly 35%, well exceeding the City's goals. This increase represented twice the level of commitment required by the City and five times more than the previous water system manager. We also kept over $250 million in the local economy, purchasing goods and services from local businesses.

For more than nine years Veolia managed the largest municipal O&M contract for a U.S. water system. Under that contact Veolia was able to set a new standard for outreach and the utilization of small and disadvantaged businesses. Added to that, the quality, safety and compliance standards that Veolia maintained at the Indianapolis water project were recognized with the water industry's first simultaneous certification under ISO 9001 and 14001 standards. These standards were maintained through the transition of the facilities and services to the new owner.

These projects are indicative of Veolia's commitment to promoting socioeconomic programs for our projects and our success providing meaningful roles to small and small disadvantaged businesses.

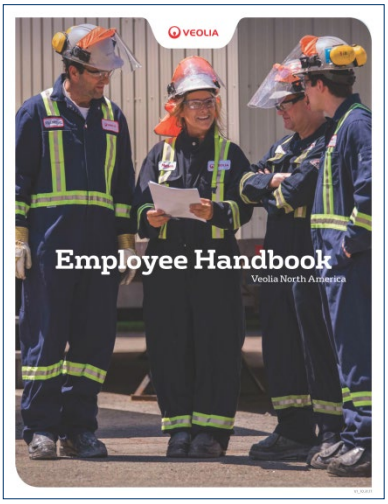
4. Employee Retention and Benefits

We applaud the effort by the JEA to protect the employees and the benefits they have built up over the years. Veolia has completed the successful transition of municipal employees both union and non-union – including the large scale transition efforts discussed earlier at Indianapolis (450 employees) and Milwaukee

(200 employees). These programs, as we discussed, involved performing detailed assessments of the employee package and any financial negotiations with the eventual owner and the strategic alternative selected.

The discussion by the JEA and the City regarding the pension program is certainly something that has to be evaluated in finalizing any commitment regarding benefits. Veolia's standard employee package provides a competitive wage and benefit package, and our firm is experienced in negotiating benefits with a broad range of unions.

For water and wastewater treatment staff, Veolia typically offers competitive employee compensation and benefits, that are outlined in our Employee Handbook, including:



- Medical Plans that offer a variety of coverage and co-pay options.
- Flexible Spending ACCOUNTS (FSA)
- Heath Savings Accounts (HSA)
- Prescription Drug Coverage Programs
- Health Care Assistance from Health Advocate
- Dental Plans offering various levels of coverage and co-pays
- COBRA Insurance Continuation coverages
- Vision plan with various levels of coverage and co-pays
- Affordable Care Act health coverage options

Veolia also provides sponsored education and other career development opportunities to our employees. For all full-time employees we also provide regular performance evaluations that set goals and assist each employee in developing a career plan. This program also allows employees to advance in terms of wages and job responsibility based on performance. Veolia also provides employment bonuses for staff that achieve professional licensing and advanced degrees.

Veolia's benefits and compensation plan and approach are designed to retain talented staff, and Veolia provides a range of incentives for water and wastewater staff to improve their certifications as well as educational opportunities and scholarships. Additionally, by joining one of the world's largest water and wastewater firms, current JEA staff would give themselves an opportunity to expand their career beyond the City of Jacksonville, with new internal Veolia positions posted regularly for roles in the U.S. and abroad.

Veolia also agrees with the idea of payment of retention bonuses to the employees. Retaining the expertise of current staff is critical to a successful transition of operating responsibility. The efficient operation of the utility will provide the funding needed in the transaction to provide those payments.

Veolia's large municipal operations, such as Indianapolis (Water) and Milwaukee (Wastewater), are representative of our approach to successful transition and retention.

While this commitment will need to be made by the lead Financial Partner (and eventual asset owner,) Veolia will be focused on the efficient operation of the water and wastewater so they will contribute to the financial package.

Labor Relations

Veolia recognizes that staff at JEA includes union represented employees, and our firm has proven experience working within a labor environment, with a strong unionized workforce, and Veolia manages/oversees a unionized workforce of 955 at over 30 contracts in the U.S., with a total of 49 active

union contracts. These unionized staff is represented by 50 union groups/locals under labor agreements that cover operators, clerical staff and laborers.

When we transition a new project and staff, Veolia works to accommodate any existing labor (union) agreements, and negotiates in good faith with unions to transition those agreement, make changes as required and negotiate new agreements where needed. Once agreements are in place, the existing unionized workforce is incorporated and transitioned into Veolia under the terms of the contract and union agreement (Collective Bargaining Agreements).

Veolia has transitioned a number of O&M projects in the U.S. with large staff sizes, and we have a well-defined process and a proven record of success.

Over the past ten years Veolia has transitioned over 500 staff from municipal clients and other contract OM&M providers:

- **Milwaukee, Wisconsin (wastewater)** – Municipal O&M - 200+ union and non-union staff
- **Jackson, Mississippi (wastewater)** – Municipal O&M - 44 union and non-union staff
- **Fulton County, GA** – Municipal O&M - 80+ staff under two separate wastewater OM&M contracts:
  - In 2010, Fulton County awarded Veolia a $56 million O&M services contract to manage their North Area wastewater operations; a system serves the needs of over 200,000 people. At the start of this contract, Veolia transitioned more than 50 employees from the County and other private O&M services providers to form a unified team that would be responsible for the long-term delivery of services.
  - In 2017, Veolia was then awarded a companion project for Fulton County's South Area contract. That project involved the transition/transfer of over 25 staff from a previous private operator and other staff the County.
- **American Water – Commercial Acquisition** – In 2018, Veolia acquired the municipal and commercial operations and staff of American Water in North America. This included more than 22 projects and more than 70 personnel in North America. This number included both union and non-union staff.

This base of work demonstrates Veolia's recent experience in successfully assimilating employees into our employment, effectively addressing labor relations, contractual and legal issues, personnel benefits, employee orientation and training.

5. Innovation Plan

At the heart of Veolia's strategy for innovations to meet its customer's challenges are our Research and Innovation efforts. This relies on scientific excellence in its research programs to improve the performance and productivity while preparing for the future. This effort involves three key actions, including:

- Cross functional and integrated innovation thanks to an internal research structure with skills and expertise recognized in the scientific world.
- Customer-focused innovation to improve the economic and environmental performance and productivity of acuities.
- Innovation opens to the world through an open innovation approach to support Veolia's entities and in contact with startups and innovative subject matter experts.

Veolia invests more than $100 million in research and development at global centers. The is effort involves more than 200 researchers and technicians working out of five research centers as well as arrangements with universities. There are more than 100 pilot tests being carried out at operational sites across the world. The result of this effort has been more than 2,100 patents filed by the company.

Additionally, in 2016, Veolia worked with one of our largest water clients to establish a new data and operations management center **ServO**.

This client, **SEDIF** (Syndicat des Eaux d'Ile-de-France), is a public entity established in 1923 and is the authority responsible for producing and distributing drinking water in 150 municipalities in the Greater Paris area. Veolia has worked with this client since 1962 to operate and manage their water utilities that serve more than 4.5 million people.

ServO, an integrated, state-of-the-art management center designed to handle over 1.25 billion data for the SEDIF system. By incorporating real time data treatment for all the service components: produce and distribute quality water in sufficient quantity under all operational configurations respond to all events affecting production, distribution or water quality provide water consumers with precise information in real time guarantee the network's technical performance, ServO provides a crucial decision-making aid to ensure continuous water supply, safety of consumer health, and crisis prevention and management.

Veolia's Hubgrade uses centralized monitoring and control centers that are tasked with managing clients' data to optimize their performance and reduce their environmental impacts. The monitoring service relies on automated protocols, and on the intervention of operators, who act on the basis of the information collected – temperatures, pressure, flow, electrical intensity, humidity, power emitted or consumed, average, peaks, dips in consumption, incidents, etc. The data monitored may vary widely depending on the type of system, the calculation capacity, the level of detail sought, and even the visualization or reporting solutions related to it. Applied to the field of energy, the monitoring service - also called energy management - is designed to raise the level of performance of an installation - for example a heating and cooling network in an office building or even of an entire business district. It contributes simultaneously to better user comfort and preserving the resources consumed.

ServO, the public water service management center, the fruit of 6.3 million euros investment, was designed by Veolia for SEDIF to centralize and consolidate all operation data, supervise and plan service management from the resource to the tap, and to suggest strategies to the operators to optimize energy consumption, environmental impact and operation costs.

Given today's challenges, which require the ability to adapt rapidly, Veolia is convinced that collective responses are the most efficient. In recent years our company has been developing innovative alliances and partnerships to embrace certain emerging businesses. Digital technology and innovation, in the broadest sense of the word, are enabling Veolia to totally transform its working methods and proposals. Customers are at the center of this transformation, which relies on collaboration between Veolia's teams around the world.

The ITN included a sample of ideas that JEA provided as potential ways to expand the utility, and Veolia has experience in many of them and has seen them cross over the water or energy to bring both together. Table 6-1, below, provides a sample of that experience in regards to water and wastewater.

Table 6-1. The Potential Future for JDA

JEA's Idea	Water or Energy	Veolia's Relevant Experience
Microgrids	Energy	Veolia has been working with wastewater plants to utilize digester gas to provide energy production. At the Milwaukee, Wisconsin, wastewater operations, Veolia, as profiled in this section, now generates 50% of the energy needs for the wastewater treatment plants, and we have helped use landfill gas to supplement the biogas produced onsite.
Beneficial Reuse	Water	Veolia utilizes wastewater for yard irrigation, agricultural irrigation and industrial needs. At our water reclamation operations project in Honolulu, Hawaii, we provide boiler feed, cooling tower feed and agricultural quality water.

Table 6-1. The Potential Future for JDA

JEA's Idea	Water or Energy	Veolia's Relevant Experience
		The treatment processes at this plant generate two qualities of water: high-purity reverse osmosis (RO) water, which is sold to industrial users for power and petrol-refining, and R1 water which is use by the City of Honolulu for irrigation. A 15-mile network of "purple pipe" distributes the reclaimed product to users.
Integrated Water Resources	Water	The rise of stormwater treatment has resulted in unique programs to store, treat and manage stormwater as well as to manage green infrastructure. Veolia's operations in Milwaukee have a large stormwater management component with 28.5 miles of stormwater lines and state-of-the-art programs that annually verify the operational readiness of critical system components and improve remote monitoring to provide more complete feedback on real-time system performance.
Battery Storage	Energy	The Rialto water wastewater operations project is now serving as a demonstration project for the BDP® EnviroTech energy saving technology. The project combines wastewater aeration technology and an integrated all-in-one bioreactor process. The all-in one bio-reactor saves construction costs and reduces footprint requirements compared to traditional systems. The assessment is to determine if energy consumption can be reduced. The demonstration project is funded through a grant from the California Energy Commission and is operated by Veolia's O&M team.
Conserve Water	Water	Veolia has experience working with industries to reuse large quantities of water for cooling water, boiler feed and production use. There is growing work with customer feedback for residential customers on their use through AMI meters.
Big Data	Energy	Veolia utilizes our Hubgrade management system to monitor remote operations, analyze data for maintenance and service response as well as providing valuable analysis for customers in water, energy and waste. Hubgrade uses centralized monitoring and control centers that are tasked with managing clients' data to optimize their performance and reduce their environmental impacts. The monitoring service relies on automated protocols, and on the intervention of operators, who act on the basis of the information collected.
Waste-to-Energy	Energy	The use of biosolids in a digester can be converted to gas or gas to energy. Complex systems are utilizing central heat and power (CHP) to maximize investments and to dry solids.
Organics Recycling	Water	Veolia is involved in converting biosolids into compost at wastewater operations in the U.S. and Canada. At the Milwaukee wastewater operations, as we discussed, Veolia is responsible for the production of the Millorganite fertilizer product, and we produce and market biosolids pellet products from our large biosolids operations in Chicago, Illinois, and Toronto, Ontario, as well as compost product from our operations in Baltimore, Maryland, as well as those in other parts of the U.S.

Table 6-1. The Potential Future for JDA		
JEA's Idea	Water or Energy	Veolia's Relevant Experience
Purified Water	Water	Veolia is involved with water purification, including reverse osmosis. Our operations in Paris (SEDIF) rank as some of the largest RO operations in the world.
Smart Building	Energy	Veolia, with Hubgrade tool, is monitoring buildings for water, sewer, gas, steam, cooling and energy. This includes providing as needed waste pickup based on remote monitoring of containers.
Renewable Gas	Energy	The use of anaerobic digesters can provide biogas for the utility that is available to power the fleet, enter a natural gas system or be used to generate power.
Solar	Energy	Veolia helped our long-term wastewater O&M client in the City of Gresham, Oregon, to reach and sustain net-zero energy using a combination of solar and digester gas for energy production.

6. Environmental, Social and Governance

Ensuring access to basic services, fair distribution of resources and conserve them for future generations are crucial challenges for our communities. Veolia works toward these goals on a daily basis by consistently monitoring our Corporate Social Responsibility (CSR) and ambitions add to our appeal with all our stakeholders, which most importantly include our customers, our employees and our investors. The way in which we integrate into our environment, support our employees and keep up a dialogue with our stakeholders determines our right to operate and has an impact on our competitiveness.

Collaboration at every level in the Group has clarified and identified the priorities in Veolia's CSR strategy. This long-term approach to progress goes right to the very top of the company. Because global sustainable development is essential, because sustainable development in the regions we serve is the reason for our existence, and because the well-being of our employees determines our performance, we have chosen to build and present our commitments and our performance on the basis of these three aspects.

Day to day, our ambition is "resourcing the world" to address the major environmental issues: conserving natural resources, combating climate change and protecting biodiversity. We deliver on this ambition every day through a determination to manage the sites we operate in an exemplary way and to provide the most efficient and innovative solutions to our customers. Since 2002, Veolia has measured and controlled the impact of its activities on both the environment and public health. Its environmental management system (EMS) is completely transparent and includes around one hundred indicators.

Veolia's business is characterized by its strong local roots and direct interaction with people's everyday lives. The Group's expertise and its development of original support solutions help it improve access to essential services across a broad spectrum of contexts and countries, meeting the expectations of the authorities who entrust Veolia with the management of their services. Efficient services enhance regional appeal and competitiveness.

In addition, Veolia seeks to deploy new relationship models with its stakeholders in order to jointly build partnerships that create value, support entrepreneurship and innovation, and maintain responsible relationships with its suppliers as part of a sustainable purchasing policy. In particular this includes incorporating sustainable development issues in the bidding process, evaluating the CSR performance of our suppliers and, through them, developing the local economic fabric. The societal value created is measured in the social reports and purchasing reports, the main indicators for which are given the CSR Performance Digest.

Veolia's prime responsibility is to ensure the well-being and fulfillment of its 171,000 employees. More than ever, in the context of a new, more integrated Veolia, the Group intends to fully assume its corporate social responsibility as an employer of choice for its employees and for the regions. Our commitment is reflected in the priority given to health and safety, through the attention paid to our employees' professional development, through the action and commitment of our managers to social responsibility and through respect for and dialogue with our internal stakeholders.

Since 2001, the Group has many indicators world-wide that are collected through a single tool especially for social data. It helps to accurately identify the realities and operational practices in terms of human resources.

Committed to social cohesion and stability, particularly at a time when our organization is changing we pay even more attention not only to the quality of social dialogue with employee representative bodies but also to respecting diversity, the principle of equality of opportunity and to fighting discrimination. Diversity and professional equality for women and men are one of the issues in performance, credibility and fairness. Veolia needs to attract all talents at all levels of the company and in all occupations.

As part of its diversity commitments, Veolia has established an action plan focusing on equality in the workplace and has set the following objectives for the end of 2020:

- 30% of women in management in 2020
- 25% of women in management teams (Comex-Codir - senior executives) in 2020

In 2018, the feminization rate for the Group's workforce as a whole was 21.04%, 26.5% of whom were women executives, and the feminization rate for the Board of Directors was 46%.

Veolia is evaluated on its governance, human resources management, environmental performance, sustainable purchasing, and societal performance, through which it qualifies for inclusion in specialized stock-market indexes.

In 2018, Veolia was doubly honored in RobecoSAM's Sustainability Yearbook, a benchmark publication for companies' CSR performance. Veolia was awarded Gold Class, presented to companies whose CSR performance is considered the best within its business sector, and the Industry Mover award for best CSR performance improvement by sector. As a result, Veolia now heads the ranking of companies in the Multi and Water Utilities category. Veolia also obtained an A– in the CDP Climate Change rating.

7. Community Stewardship

The JEA, in your ITN document, stated that "Respondents will be treated favorably for their willingness to make commitments to the City of Jacksonville and surrounding communities, including, but not limited to, volunteer activities, charitable contributions, an ongoing community relationship plan and comprehensive storm responsiveness plans."

Veolia's activities contribute to the communities' well-being, the efficiency of companies and the attractiveness of territories. By doing so, they directly or indirectly create value for stakeholders.

At Milwaukee (our biggest wastewater O&M contract in the U.S.) this year's Doors Open event at the Jones Island Water Reclamation plant saw more than 1,700 attendees join us for an immersive day on site. Our team led 39 tours in just under seven hours, and staff and volunteers engaged with approximately 250 people per hour throughout the one-day event. The tours offered an overview of how wastewater is treated before returning it to Lake Michigan. Half of the audience also enjoyed the hard-hat tour, which included a

walkthrough of the dewatering and drying facility where Milorganite®, Milwaukee Metropolitan Sewerage District's (MMSD) signature biosolids product, is made. In addition to the tours, guests enjoyed other exhibits and activities:

- **Collectible bug cards** - children visited different exhibits to collect seven cards that describe the microorganisms or "bugs" that help clean the water.
- **High-powered microscope presentation** - this exhibit captivated audiences of all ages with an educational demonstration of these microorganisms under the microscope.
- **Wastewater treatment maze** - children were invited to learn more about the treatment process by maneuvering through this giant paint maze.
- **Falcon spotting** - guests gazed to the skies to look for the peregrines that return to Jones Island site each year. Depending on the time of day, visitors could use the scope to spot these resident falcons.
- **Big truck display** - offered children a chance to get close and personal to some of our larger workhorses.
- **Milorganite® 5 pound bag giveaway** - visitors received free bags upon exiting the parking lot.
- **Veolia Theater** - a movie dedicated to the great work MMSD is doing throughout Milwaukee and how we're playing an important role.

In the City of Baltimore, Maryland, where Veolia has ongoing energy and wastewater operations, our firm has, since 2007, partnered with YouthWorks to help young adults gain industry-relevant work experience in their local area. Several interns became full-time employees after their initial engagement through YouthWorks. These summer jobs program offers thousands of people ages 14 to 21 five-week job experiences and typically employs around 5,000 people each summer. In 2018 and 2019, approximately 11,500 Baltimore youths completed the YouthWorks registration, highlighting the program's engagement in low-income communities.

Through the program, our team in Baltimore has embraced several partnerships focused on mentoring local young people while helping to close the city's skills gap. This summer five young people joined Veolia from June to September. They will learn firsthand about Green Steam – the steam generated through renewable energy – and the sustainable development that powers Baltimore while spending time in operations, marketing, purchasing and production.

Veolia has also established an internal group, the Veolia Foundation, to foster community programs. Created in 2004, Veolia Foundation supports community-oriented, nonprofit projects contributing to sustainable development, in France and abroad. Its priority areas of action are humanitarian emergencies and development aid, employment and social links, and environmental conservation and biodiversity. The foundation also supplies emergency aid in the wake of natural disasters. Since its creation, the foundation has supported more than 1,450 projects and carried out more than 200 skills volunteering missions. The foundation provides emergency aid to ensure access to drinking water along with energy and waste management in response to natural disasters and humanitarian crises. It also promotes development projects for these vital services, which are part of Veolia's core expertise.

The foundation supports organizations that help people who are isolated from the job market to find work through assistance programs and training, fostering the transition to employment and combating exclusion. Since finding a long-term job is a priority objective, the foundation seeks to build "bridges" between jobseekers and the company's business activities. The Foundation encourages initiatives to build public awareness and teach eco-responsible behavior. It also backs ambitious projects to further our understanding of and restore natural environments.

The foundation is unique in that every project it supports is accompanied by a sponsor who is a company employee, and because it provides the expertise of employee volunteers, through Veoliaforce, to emergency and development missions.

In 2010, Veolia Foundation donated $33,000 to the Chicago Southland Youthbuild Program.

The Veolia Foundation makes Veolia's expertise and know-how available to the international humanitarian organizations that enlist its assistance in responding to natural disasters and promoting lasting improvements in the living conditions of the most disadvantaged people. It has established partnerships with a number of bodies, including the French Red Cross, MSF (Doctors Without Borders), Médecins du Monde, UNHCR.

The Veoliaforce action team has 400 volunteers who represent all of Veolia's core businesses (Water, Energy and Waste Management). It dispatches its experts and equipment to provide emergency humanitarian aid and restore safe sanitary conditions in response to natural disasters. Veoliaforce also contributes to development projects for essential services supported by the foundation around the world.

In the fall of 2017, the Veolia Foundation intervened in Saint Martin, in the French West Indies, after the devastating cyclone Irma. In the face of the emergency, the Foundation's mobilization was total, in particular to restore water production in the particular context of the first days after the disaster. A mobile desalination unit was sent from Spain and the Foundation's experts worked on water distribution to supply 12 fixed points connected to the general network and managed with the French Red Cross. At the same time, Veoliaforce volunteers have been rotating more and more in the field to strengthen local teams in the search for and repair of leaks in the pipes of the general network. Within a few weeks, water production and distribution gradually returned to normal in Saint Martin.

Veolia also maintains a strong commitment to be a contributor to the communities that we serve, with community economic development and community workforce development types of programs. Our initiatives in this area include local hiring and **internship programs**, such as that under our ongoing contract with the **University of Minnesota**. Each semester, Veolia hires a student from the Engineering School to work with our onsite team, performing work such as creating/updating P&ID drawings, identifying single points of failure and assisting with root-cause analyses. The students are provided with valuable real-world experience to supplement their classroom education and gain a first-hand understanding of how energy systems function.

Beyond this local work, Veolia has maintained **active internship and mentoring programs** in other parts of the U.S, including an active internship program at our wastewater operations in **New Orleans**, where we work with community groups to recruit and training apprentice operators that with our O&M team at this site – in fact we have hired from this program to fill full-time O&M roles at the operations. Veolia's apprenticeship program at New Orleans is done in collaboration with our client (the Sewerage & Water Board) and Limitless Vistas, Inc. (LVI), a job-training, non-profit organization based in the City of New Orleans. This program provides summer-internship opportunities for inner-city youth at the wastewater operations, introducing local high-school level students to real and sustainable entry-level job opportunities in the

LIMITLESS VISTAS, INC

water and wastewater utility sector. Our current staff at New Orleans includes several full-time operators that are graduates of this program.

Other aspects of Veolia's internship program at New Orleans include business training, in areas such as office administration and financial aspects of wastewater facility operations and the basics of using office administration software for buying materials and parts and paying vendors' invoices.


Veolia's internship program team at New London.

Another example of Veolia's commitment to training an **internship programs** is our work at the **City of New London, Connecticut**, which is profiled in this excerpt from Plant Operator Magazine:

(Excerpted from "Get 'Em Early, Train 'Em Right" by Doug Day – "When the New London Pollution Control Authority signed a 10-year, $59 million contract with Veolia Water North America to operate and manage its wastewater and water systems in March 2008, the agreement required an intern program that would provide a source of staffing, along with educational and employment opportunities for people in the community.

Working with the city, Veolia Water has focused on mentoring and training, during which some candidates have discovered a passion for the environmental services field. The program also benefits team members at the plant, who see it as an opportunity to pass their knowledge on to the younger generation.

Although this internship program was initially a requirement, the City of New London used its partnership with Veolia as an opportunity to truly embrace the local community.

Having trained over 20 high-quality candidates who are strongly engaged in the environmental services field, Veolia ultimately employed 11 interns as full-time employees, four of them now managers and all of them local to the community with promising careers ahead of them. As environmental service is the core of the partnership, Veolia has worked with the city to further encourage these principles among local residents as well.

To this end, the partnership implemented a unique scholarship program in which Veolia designates $5,000 to well-deserving high school seniors interested in the environment. Veolia is also engaged in local learning institutions, using this New London infrastructure as a classroom for local middle school, high school and colleges to learn about their natural resources."

These are the types of programs that Veolia can offer to the JEA and the City of Jacksonville to support this new initiative.

8. Financial Stability

Veolia is one of the largest environmental firms in the world with $30.1 billion in 2018 revenue and over 171,000 employees worldwide. Over the past few years Veolia has steadily improved its operational performance and increased profitability.

For example, in 2018, EBITDA came to $3.9 billion, an increase of 7.3% at constant exchange rates. Cost savings totaled $347 million, which is on target with the $344 million we had set. The $775 million in current net income represented a 14.7% rise at constant exchange rates and excluding capital gains.

Lastly, our net financial debt fell below the $11.5 billion mark as expected and is therefore under control. 2018 saw a continuation of the solid growth already seen in our results over the past few financial years. Indeed, the pace even picked up resulting in higher growth.

For the past three financial years, our revenue has annually increased by 4% at constant exchange rates, EBITDA by 5% and current net income by 10%. This is proof that we are firmly set on a path of profitable and sustainable growth.

Veolia is looking to grow, invest and acquire operations that align with our water, waste and energy activities. Veolia has recently acquired an energy consulting business (Enovity) as well as the majority of the municipal water and wastewater O&M contracts of a major competitor (American Water.)

TAB 7

Additional Information

Veolia - Indianapolis, IN

Water Partnership

Tab Seven:

Additional Information

Introduction

Through this Invitation to Negotiate (ITN) the JEA is seeking strategic flexibility to adapt in a "once in a generation" type of transformation to help your achieve with its vision to improve the lives of its citizens in Northeast Florida.

That is an exciting opportunity and **Veolia**, as the global leader in water and wastewater management, is excited to respond.

We can add significant value to unlock JEA's growth potential through a wide range of innovations, some that you have already identified, focusing first on the water and wastewater systems. Veolia and also bring this same type of an approach to support your electrical and chilled water systems operations.

Veolia is proposing a solution that will assist JEA in maximizing the Customer, Community, Environment and Finance value for citizens by building on your strengths. This will be done while also taking advantage of our ability to innovate without the constraints that JEA is currently faced with.

JEA is the eighth-largest government-owned utility company in the U.S. and the largest in Florida. Over 466,000 electric customers, more than 359,000 water customers and over 270,000 wastewater customers rely on JEA services.

Other objectives that Veolia has in submitting this response to your ITN are to detail the specific areas where we can add value, and also to propose a methodology for capturing that value in the most beneficial and expeditious way for the benefit of JEA and your utility customers.

In this section we provide examples of where Veolia has been able to work with municipal utilities like yours to develop innovations to address current and projected future needs and issues.

Veolia Work Example: Innovative Management Approach

Under a comprehensive five-year agreement that began in 2011, Veolia worked with the **New York City Water Board, the Department of Environmental Protection (DEP) under the Operational Excellence (Opx) program**.

The work under this contract involved mobilizing Subject Matter Experts from Veolia's North American and our global operations groups and then teaming those resources with public-sector professionals from the DEP.

These working teams focused on identifying opportunities to make improvements in every aspect of New York City's water and wastewater infrastructure. Experts from Veolia provided the analytical and technical expertise needed to measure baseline performance and to analyze the impacts of potential improvements.

Working together Veolia and the DEP implemented individual improvement ideas, and the overall benefits achieved were over $82 million in annual savings and improvements.

"To say we've gotten our money's worth from [Veolia] is an understatement."
– Steve Lawitts, NYC DEP Chief Financial Officer.

Veolia's approach with New York City centered on bringing a broad cross-section of resources, including some 50 staff from our operations and projects in Berlin, London and Paris, as well as veteran management staff from some of our largest North America operations.

Under this approach, teams of New York City employees worked with Veolia's team of operations, maintenance, engineering and management specialists to implement more than 90 selected efficiencies.

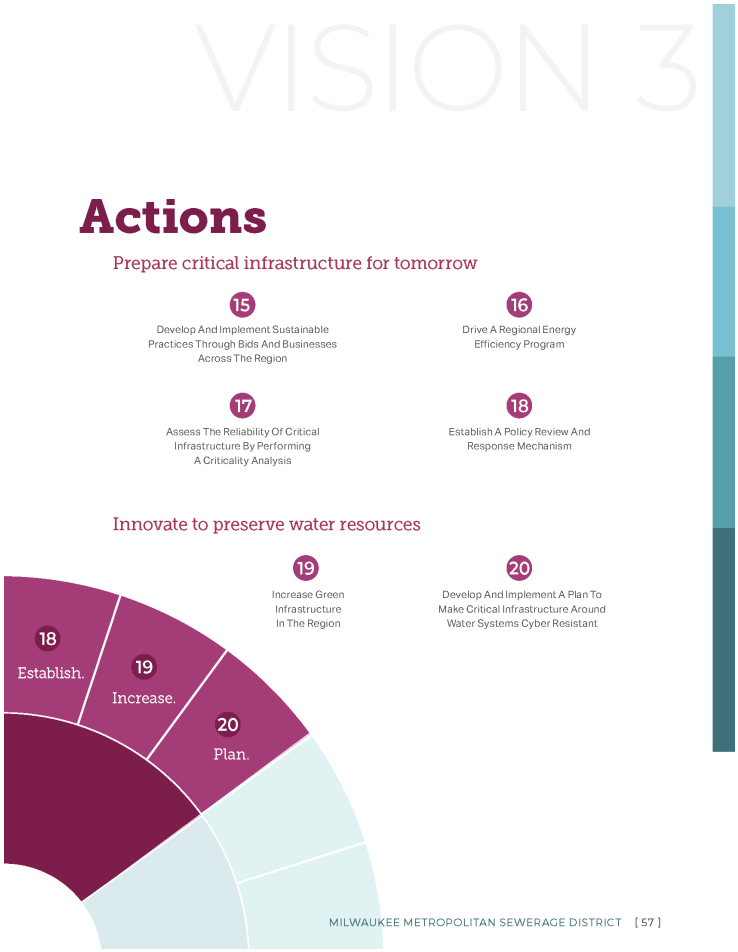
[Attachment 7-1 to this section provides a copy of the final report for the Operational Excellence program, which provides further information on this program.]

Veolia Work Example: Resiliency

In our work with utilities like yours, Veolia has responded to the disruptive forces facing communities across the country and the globe. That work included a resiliency study for **Milwaukee, Wisconsin**.

The work at Milwaukee involved conducting an analysis of the risks and challenges facing this region. A prioritization exercise was performed during workshops conducted with 28 municipalities in the Milwaukee Metropolitan Area and a panel of stakeholders with a vested interest in the process. The focus of this effort was to outline a regional action plan for territorial actors.

This resiliency planning work identified some 20 actions. These actions were chosen by stakeholders, and grouped into three vision categories. The focus areas selected aligned with focus areas of the 100 Resilient Cities organization, and included:



Vision 1 – Focuses on creating a path toward increasing well-being for community members by mobilizing them around key issues and by improving the quality of public spaces and services. The recommended actions under this Vision focus on addressing the environment and society.

Vision 2 – Focuses on ways to improve access to jobs by creating and connecting people to current and future opportunities in order to close the wealth gap and ensure that quality of life is not determined by race or ethnicity. The vision is to create a community in which intergenerational wealth-building opportunities are accessible to all and that youth are connected to educational opportunities that prepare them for their careers. The recommended actions under this Vision focus on addressing the economy and society.

Vision 3 – Focuses on understanding that infrastructure (both new and aging) strains budgets and can limit the growth potential for businesses and communities. Innovation and new technologies have the potential to save time and money and individually contribute to resilience. But to have a truly resilient region, new systems must be created and old ones adapted. The recommended actions under this Vision focus on

addressing infrastructure and the environment. This will involve using collaborative approach for adapting critical infrastructure to the challenges of the 21st century in order to mitigate risk, optimize assets and enhance the quality of life.

Each of these visions was accompanied by a set of actions, including those to support the water and wastewater infrastructure.

[Attachment 7-2 to this section provides a copy of the Milwaukee Resiliency Report, which provides further information on this program.]

Veolia Work Example: Hurricane Planning and Recovery

Veolia has worked as the operations, maintenance and management (O&M service provide to the **New Orleans Sewerage and Water Board (S&WB), Louisiana**, since 1992. This O&M partnership has been renewed multiple times, most recently in 2014 for a 20-year contract term that covers operations and facilities that include: two wastewater plants, the East Bank Plant (a 122-MGD pure oxygen secondary treatment plant), and the West Bank Plant (a 20-MGD trickling filter plant); septage receiving and processing; a 40 dry ton per day fluidized bed incinerator (FBI) unit for sludge/biosolids disposal (11,489 dry tons per year); wetlands assimilation; as well as the management of capital projects.

New Orleans - Hurricane impacts at the wastewater plants.

When hurricanes Katrina and Rita devastated the Gulf Coast and the City of New Orleans, the S&WB's East Bank plant was completely submerged under 22 feet of floodwaters. One month after the disaster struck, the East Bank plant had been completely dewatered, and two weeks later, 30 million gallons of water was flowing through the facility.

Meanwhile, the U.S. Environmental Protection Agency (U.S. EPA) imposed a 60-day deadline to restore secondary treatment capabilities, Veolia successfully met the regulatory agency's goal with one week to spare.

Out of $54.5 million in available funding to restore the New Orleans wastewater treatment facilities, Veolia completed some $47 million in hurricane recovery work, applying Federal funds to the maximum benefit of the affected facilities, the S&WB and the City of New Orleans. We directly coordinated projects with the Federal Emergency Management Agency (FEMA) as an agent for the S&WB, providing damage estimates, defining scopes, cost estimates and work justifications.

As part of the overall hurricane response efforts at New Orleans, Veolia mobilized a global aid effort through Veoliaforce (a part of the Veolia Foundation), which is an emergency relief team established within our company in 1998. The mission of this group involves stepping in quickly when relief is needed anywhere in the world. Our company sent equipment and experts from across the world to provide clean water and aid in

facility recovery. Veolia companies also contributed over $1 million to the Red Cross for hurricane recovery efforts.

Veolia is also engaged in education and environmental projects at New Orleans and Tulane University is key a beneficiary of the partnership. Under this initiative, Veolia donated money to Tulane for students to research wetland assimilation and alternative disinfection processes. The wastewater treatment plants and staff provide a field laboratory and samples to study effluent disinfection. These efforts contribute to the initiative of restoring the wetlands and cypress forest in Louisiana. In another project, ash from sludge (biosolids) incineration will be used to help with improving the natural landscape of New Orleans while eliminating the amount of ash sent to landfill.

Most recently, Veolia, in collaboration with Swiss Re and the City of New Orleans collaborated on the Building a More Resilient New Orleans study and report.

This study looked at the impacts of Hurricane Katrina and identified approaches for the City to use in protecting itself against similar events and/or any other chronic stress or shock. As noted in this report, the City had set itself the priority of improving its understanding of exposure to risks and transforming its urban system. Resilience requires global risk management, combining physical and financial protection. This was the focal point of the risk assessment plan implemented by Veolia, Swiss Re and New Orleans, in the context of the first international public-private partnership on resilience. This partnership focused on optimizing prevention costs and reducing post-event losses, as well as the recovery period after a shock.

For a period of four months some 30 Veolia and Swiss Re experts, in coordination with stakeholders in the City, examined 200 drinking water, sanitation and rainwater evacuation facilities in the City in order to determine their degree of vulnerability and recommend the appropriate action to ensure these facilities are able to resist a shock.

The results were documented in the report, which is provided as Attachment 7-3 at the end of this section.

Veolia Work Example: Generating Results in a Complex Management Structure

Veolia also worked with the **District of Columbia Water and Sewer Authority (DC Water)** on a study of its largest wholesale customer of the **Washington Aqueduct** (Aqueduct).

"The Veolia report is probably the best report we've ever received from a consultant in terms of the work they did and the way they carried it out." – Sarah Neiderer, Special Assistant to DC Water General Manager George Hawkins (globalwaterintel.com, Vol. 14, Issue 12, December 2013)

This water system, with a 240-MGD surface water treatment plant, 150-MGD surface water treatment plant and 10,000-ton/year residuals management facility, serves the needs of more than 1.1 million people in a service area that covers Washington, DC, and the surrounding area.

The Aqueduct is a federally-owned public water supplier operated by the U.S. Army Corps of Engineers and DC Water's goal was to conduct a comprehensive evaluation of the Aqueduct's operations and related organization processes and then recommend improvements that add value to the delivery of services to its wholesale customers.

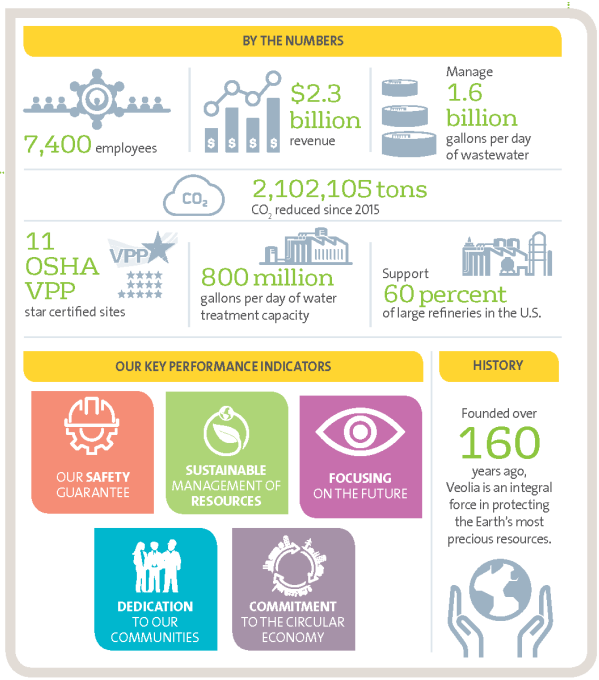
Working in collaboration with Aqueduct staff, experts from Veolia reviewed every aspect of the Aqueduct's operations, including the treatment process, maintenance and all support functions.

This review included the Aqueduct's capital program and an assessment of financial performance, as well as a high-level asset valuation.

Additionally, Veolia's team worked to benchmark the Aqueduct's operations against some of our company's own operations, as well as other publicly operated utilities in order to identify gaps in performance and efficiency.

Some 25 individual improvement ideas were identified and thoroughly evaluated during study phase, and up to 15% in savings were identified by Veolia's team at the Aqueduct.

Veolia prepared a comprehensive report to the DC Water on the results of the study and then helped to implement initiatives to improve the operations. A copy of that reports is provided at the end of this section as Attachment 7-4.



Veolia's Corporate Commitment to Sustainability

Veolia, as a company, has made a commitment to resource recovery and solutions in water, waste and energy.

In fact, our company has been leading this effort for decades, both across North America and the world, putting us at the forefront of enhancing customer value through sustainability.

Attachment 7-5, at the end of this section, provides a copy of our 2018 Sustainability Report, which documents those efforts.

Attachment 7-1

Operational Excellence Program
Final Report to the New York City Water Board

Veolia

October 2017

OPERATIONAL EXCELLENCE (OPX)

Final Report to the Water Board

Prepared by Veolia for DEP and the Water Board | October 2017

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EXECUTIVE SUMMARY

Operational Excellence (OpX): The Best Always Do Better

In 2011, the New York City Water Board, the Department of Environmental Protection (DEP) and Veolia embarked on a journey; one designed to help the agency achieve its goal to be the safest, most productive, cost-effective and transparent water utility in the nation.

After years of double-digit rate increases, DEP leadership understood then (and does today) that before asking ratepayers to do more, the agency needed to ensure that it was doing everything possible to mitigate rate increases and ensure affordability of water services for all New Yorkers. Rather than undertake more across the board budget cuts, DEP and Veolia worked together to find real opportunities to save money through operational changes and help an already world-class team of professionals implement their own and outside ideas for improvement.

The groundbreaking Operational Excellence program, or OpX, teamed public-sector professionals with their peers in the private sector to identify opportunities to make improvements in every aspect of New York City's water infrastructure – from the upstate watershed, to the thousands of miles of in-city distribution and collections networks, the 14 water pollution control plants, and customer service operations. Veolia teamed with McKinsey & Company and Arcadis to provide additional analytical and technical expertise to measure baseline performance and analyze the impacts of potential improvements.

The OpX program looked beyond individual projects and encompassed a number of transformational initiatives, including enhancing performance management, strengthening core capabilities in human resources and procurement, and fostering an organizational culture focused on performance and continual improvement.

Throughout the program, one thing was clear – DEP has been and continues to be a world leader in meeting drinking water and wastewater compliance and achieves performance levels well above similar sized utilities around the globe.

DEP's foundation is rooted in the strength of its employees, their quality of work and their commitment to being the best. The program's tagline, "The Best Always Do Better" reflects the thinking of DEP leadership and nearly 6,000 employees – we are the best at what we do today, but there is more that we can do tomorrow.

CONTEXT

OpX is providing a lasting and sustainable impact on DEP's bottom line. 2015 and 2016 rate increases were the smallest in years and the savings and efficiencies achieved through the OpX program are, in part, responsible for this. Inside this final program report, DEP and Veolia present to the Board in detail, the overall successes of OpX. We are proud of our efforts to date and, building on DEP's strong foundation, are confident that the improvements will offer financial and quality of life benefits for 9 million New Yorkers for years to come.

Operational Excellence Program – Primary objective

At the outset of the OpX Program, DEP asked Veolia to help it:

1. Use resources and material efficiently and sustainably
2. Help DEP's workforce become more effective
3. Improve revenue collection for services rendered
4. Strengthen fact-based performance culture (change management)
5. Invest in organization support, culture and technology

OpX was designed to build on the proactive steps that DEP had already taken to improve performance, transparency, customer service and financial accountability. These steps helped reduce the organization's operating costs by more than 15 percent during the three years prior to the start of OpX.

Rather than responding to ongoing financial pressures with budget cuts that might weaken critical services, the OpX initiative fostered smart improvements that strengthen DEP operations well into the future.

The OpX program aimed to streamline workflows, boost efficiency, and continuously identify opportunities for improvements that will allow DEP to maintain its high level of customer service, safety, and productivity while minimizing rate increases for its roughly 836,000 rate-payers. To achieve this, the Commissioner set an ambitious goal for OpX.

OPERATIONAL EXCELLENCE PROGRAM
Methodology

The initial, six-month diagnostic phase of OpX involved almost all aspects of DEP operations and supporting administrative functions. During this phase, we compared DEP with other leading utilities around the world and gained a deep respect for the strengths that make DEP a world-class organization, while also identifying areas for improvement.

Working with DEP, the team identified more than 100 ideas that warranted additional analysis and evaluation. Ideas reflect external industry best practices, data analysis, and ideas generated by DEP personnel. Functional experts, operators, and managers from other American and European large-scale water utilities were involved in the assessment and modeling of DEP's operations and contributed case examples of alternative strategies.

The team evaluated each idea for impact, feasibility, and potential barriers to implementation. As ideas were substantiated, they were put through an established escalation process to receive input from and to be vetted and approved by DEP senior management.

Operational Excellence Program – Final Results

Managing the implementation of the 87 individual improvement ideas was a complex task. DEP employees and OpX as a whole benefitted from the experience of content experts familiar with the challenges to implementing and sustaining change. In addition, a proven governance structure and tools such as capability-building workshops, field application and coaching aided in the development and execution of change. The overall benefits are provided here.

	Sum of Average Annual Impact	Cumulative Impact (over OpX program history)
Program Total	**$82,231,000**	**$218,974,000**

Use resources and materials efficiently and sustainably

Leverage technical innovation and best-in-class processes and procedures to continue delivering high-quality service cost-efficiently. Examine and analyze drivers of resource usage and impact to ensure that DEP is getting maximum productivity out of the resources it uses.

Energy Efficiency

Drove 15 energy efficiency initiatives within BWT and BWS. In wastewater alone, efficiency was increased by over 18M kWh/year, which represents an average drop of 7% across 14 plants.

- **Increased energy generation** and reduced the volume of sludge transported for disposal by improving sludge thickness from gravity thickeners in wastewater treatment plants
- **Managed energy demand** and increased participation in demand response programs

Chemical Dosage

Implemented 18 chemical dosing initiatives across three bureaus including, BWT, BWS and BWSO.

- **Optimized chemical dosage** amounts to align with revised national guidelines
- **Reduced operating expenses** by optimizing chemical dosage

Additional focus in BWT

Drove 14 additional initiatives in BWT to reduce operating expenses by reorganizing maintenance assets, changing contract specifications, and targeting modifications to wastewater treatment process

> **"The systematic approach to implementing initiatives and the best management practices we have instituted under OpX have increased our openness to trying new approaches, which will help to foster innovation in the future."**
>
> –April O'Neil, NYC DEP OpX Director

Help DEP's workforce become more effective

Ensure existing equipment is available for use, provide more appropriate and innovative tools and equipment, plan work better, implement automation where safe and feasible, reduce administration, and simplify processes.

Bureau of Wastewater Treatment

BWT implemented 14 initiatives to improve its workforce efficiencies through improved operational structures and standardization.

- **Seven (7) facility managers were employed** to provide holistic management of plant sites
- **Six (6) maintenance facilitators were employed** to drive maintenance program optimization
- **Three (3) performance analyst roles were created** to track continuous improvement of processes
- **Strengthened maintenance planning process** to ensure right people with the right equipment are sent to do the right job (staff talent and capabilities)
- **Developed toolkits** for staff to optimize their daily activities to drive overall performance improvement
- **Realigned job classifications** of operational-affiliated positions and right sized shift operations head count at four plant sites

Bureau of Water Supply

BWS implemented 14 initiatives to improve its workforce.

- **Created one centralized** BWS operations center
- **Identified staff development opportunities** and consolidated positions for optimal resource utilization

Bureau of Water and Sewer Operations

- **Introduced and integrated new equipment** into daily activities and operations to streamline process and increase productivity

Central Functions

The Central Functions work stream implemented 19 improvement initiatives related to procurement of goods and services, the management of DEP's vehicle fleet, and use of cell phones and other mobile devices.

- **Reduced 3rd party spend for good and services** by improving sourcing specifications, actively increasing competition among suppliers, and supporting contract negotiations. Provided negotiation training to DEP staff to build in-house capabilitie**s**
- **Applied spend analytics, price benchmarking, clean sheets and spec reviews** to determine overall savings potential achieving price reductions as high as 25% on some contracts and to identify focus spend categories
- **Achieved quick-win savings** by end of FY13 through price negotiations and rebids with improved specs
- **Realized savings** by right-sizing of DEP's light- and medium-duty vehicle fleet, adapting preventive maintenance practices to industry standard, and increasing the availability of critical heavy-duty equipment

> **"DEP is a world leader and our teams take justifiable pride in their work. As a global company, Veolia was able to suggest ideas they had seen work somewhere else that we were able to then blend with our teams' local expertise and know-how to produce maximum results."**
>
> – April O'Neil, NYC DEP OpX Director

OPERATIONAL EXCELLENCE PROGRAM | OBJECTIVE 3

Improve revenue collection for services rendered

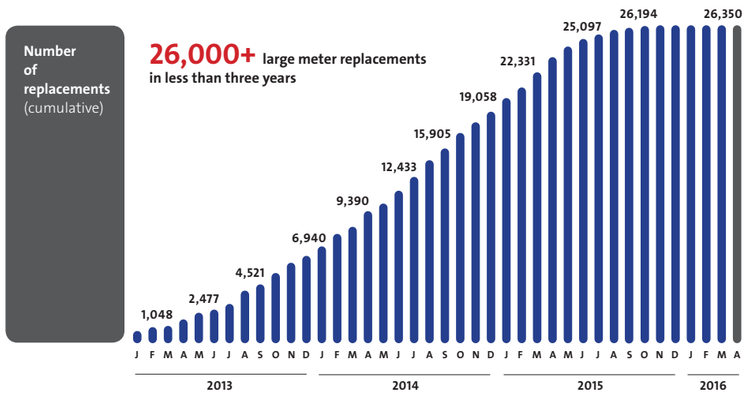
Minimize the under-recording of consumption due to meter inaccuracies so that customers are billed equitably and fairly, thereby optimizing DEP's revenue collection and minimizing revenue erosion. The program replaced about 26,000 meters by targeting NYC's largest water consumers, including some of the largest commercial buildings in the city. This program ensured the largest consumers paid their fair share to keep water rates as low as possible for the average consumer.

Bureau of Customer Services

With Veolia's support, BCS implemented a rigorous large meters replacement program that transformed processes, systems, and tools related to meter management and enabled a significant increase in the revenue collected for the agency.

- **Generated significant annual reoccurring savings** by targeting and prioritizing DEP's meter replacements using statistical data driven methods
- **Replaced over 26,000 large (1.5 inches and above) meters** In less than four years by implementing rigorous process tracking and project management practices
- **Provided automated analytics that diagnosed where bottlenecks** were occurring, allowing the city to proactively address issues
- **Supported the development of a best-in-class** meter testing facility by helping define testing protocols, improve data collection and analysis, and institute robust processes
- **Instituted a comprehensive meter replacement strategy** that can be used to target and prioritize under recording meters, beyond Veolia's engagement

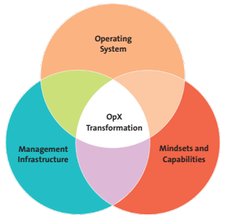
One of the largest programs of its kind worldwide



OPERATIONAL EXCELLENCE PROGRAM | OBJECTIVE 4

Strengthen fact-based performance culture (Change management/performance management)

Increase emphasis on fiscal transparency, understanding, and accountability across DEP through scorecards and operational metrics. This initiative would build upon the transparency that already exists through H2OStat and allow DEP to cascade responsibility and ownership down the line, empower the entire organization to drive performance, and promote good stewardship of public funds.



A proven Performance Transformation approach built around three core elements was used to ensure sustainable performance improvements during implementation: Operating System, Management Infrastructure, and Mindsets and Capabilities.

Operating System: Streamlining the processes and flows of information and materials to make the change happen. This included optimizing tools and systems and developing SOPs for everyone to follow in performing their jobs. For example,

- **Implemented additional process controls** for aeration, thickening, dewatering and & digestion, and disinfection
- **Increased use of available technology** to improve data management
- **Completed analysis of alternative technology** options to drive further efficiencies
- **Documented over 200 processes** and implemented process improvements
- **Led process redesign workshops** and trained staff in redesign and transformation approaches with the aim of improving efficiency and the quality of service delivery

Management Infrastructure: Establishing comprehensive performance management system for the project that included stringent project management and governance along with a clear set of roles and responsibilities developed for implementing the project. For example,

- **Created 14 wastewater treatment plant scorecards** to track performance in real-time
- **Developed dashboards and reporting tools** to support decision making processes
- **Developed site-level reporting** for wastewater treatment plants to provide new facility managers with transparency to manage safety, compliance and efficiency
- **Established new governance structures** to provide oversight on initiative progress
- **Improved alignment of roles and responsibilities** within operating teams

Mindsets and Capabilities: Creating a clear vision, direction and compelling purpose for the project, which engages the organization. The vision is supported by strong leadership, team alignment, communication and a focus on improving individual capabilities. For example,

- **Developed and rolled out a Process Transformation** to 13 plants in 12 months, to be used to implement process improvements and instill a culture of continuous improvement
- **Provided training for 41 laborers and 9 supervisors** on how to better utilize equipment in the field
- **Implemented Management of Change** process to mitigate process change risk
- **Facilitated multiple prioritization workshop**s to engage staff and drive idea generation
- **Created program branding** including a roadshow by the Commissioner and COO to all DEP sites, newsletters, posters, and an employee suggestion program

> **"The quality delivered and value-added by the members of the Veolia team is measured not only by the impact of business process improvements we've accomplished, but by the new willingness of my employees to own the process."**
>
> – Diana Jones Ritter,
> Deputy Commissioner OD& HR, NYC DEP

Invest in organizational support, culture and technology

Providing the foundational needs necessary to achieve the goals and objectives contained in the first four themes. Strengthening support functions and governance that contribute to every financial and core operational performance improvement, and are critical to organizational change at DEP. Each requires that DEP has the right capacity and capabilities in people, culture, and tools.

Additional services were provided to support specific organizational needs from the bureaus.

Bureau of Customer Service

BCS requested support to safeguard against future revenue erosion by taking a proactive and data driven approach to meter management while ensuring that best practices are followed in the future management of its meter replacement program.

- **Created a thorough fact base on the current state** of DEP's large meter management program from 'cradle to grave' and identified immediate and longer term opportunities for improvement.
- **Designed a future state** that can support objectives of large meter management and ensure agreement on a path forward

Bureau of Wastewater Treatment

BWT requested support to both enhance the existing capability and effectiveness of the Computerized Maintenance Management System (CMMS) data capture and develop a data management strategy for operational data.

- **Improved maintenance management** by increasing CMMS data capture and reporting
- **Improved operational asset management** by increasing ability to track asset condition and prioritize asset replacement planning
- **Documented business requirements** for the future management and use of operational data
- **Developed an implementation plan** for the automation of current processes into a future solution

Fleet Services

Fleet services requested support to optimize the availability and renewal of the current fleet

- **Identified over $2M** in savings by optimizing the procurement of DEP vehicles
- **Developed vehicle specifications** that increased vehicle safety and better matched operator needs
- **Developed a 30-year dynamic capital replacement plan** that can be applied to any vehicle type
- **Developed and implemented a digital solution** that analyzes vehicle data and provides key metrics

> **"Taking a look at our standard process practices is good, as it facilitates assessment of concepts that can optimize efficiency."**
>
> – Facility Manager

Organizational Development & Human Resources

OD&HR requested support for their goal of improving service delivery and commitment to key strategic and operational goals.

- **Worked with Commissioner** to raise the profile of Organizational Development and Human Resources by **creating a new Deputy Commissioner position** and giving the new OD&HR department a broader mandate
- **Business Process Improvement** (BPI) Project focused on improving work flow consistency with roles and responsibilities, document management, and customer engagement communications
- **Streamlined the hiring process** to ensure that on-boarding effectively prepares new hires and build talent through right developmental experiences
- **Assessed DEP's organizational culture** and implemented targeted interventions to provide a foundation to develop a more positive environment with a workforce committed to the organization's values
- **Supported and helped develop a best-in-class employee service center model** that aims to improve service delivery, workflows, accountability, communication, standardization, employee satisfaction, technology utilization, document and forms management, and knowledge transfer
- **Supported and helped develop a CRM system** to improve service delivery, employee communications, process automation and metrics tracking

CRM = Customer Relationship Management

Bureau of Engineering, Design and Construction

BEDC requested support to assess project delivery productivity and provide peer support on cost management practices.

- **Developed and expanded formal governance frameworks** from project level to management level to clearly define accountability and improve overall operations
- **Transitioned project cost management** into new automated ePMIS system while providing staff augmentation and training support
- **Established action plans** for 15 high priority contracts
- **Created program and project level reporting tools** to support improvements in accountability and oversight
- **Developed a three year strategic plan** for the project management office

> **"It's great having a formalized process for getting everyone's input and determining which ideas should move forward."**
>
> – Process Engineer

Vision for the future

The OpX program has resulted in increased affordability of critical water and wastewater services for 9 million New Yorkers and set DEP on a path to a sustainable future as the safest, most productive, cost-effective and transparent water utility in the nation. DEP employees are largely responsible for the success of the OpX program and were key and critical in achieving the ongoing successes that the city should celebrate.

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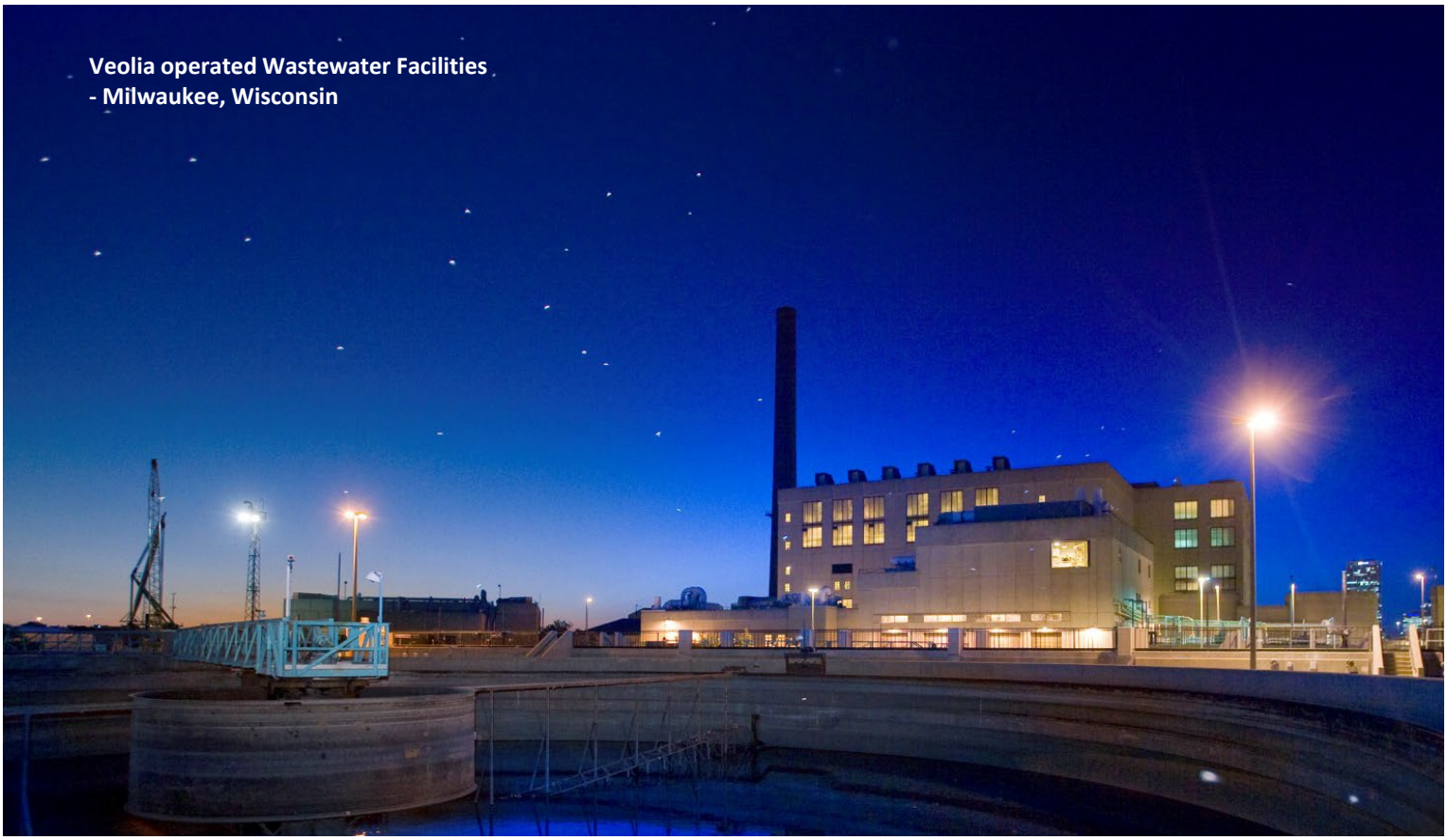


Veolia operated Wastewater Facilities
- Milwaukee, Wisconsin

Attachment 7-2

2019 Resilience Plan

Milwaukee, Wisconsin

2019

RESILIENCE PLAN

A framework for how the Milwaukee metropolitan area can address complex threats for a stronger, more resilient region.

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT

MMSD.COM

Letter from the Milwaukee Metropolitan Sewerage District

COMMISSION CHAIR

Our Resilience Plan is a testament to our love for the Great Lakes and the region that surrounds the great City of Milwaukee. The plan accentuates the region's rich history of using the bounties of Lake Michigan to enhance the livelihood and well-being of its people. Hard-working people have worked tirelessly to make the Milwaukee region the beautiful place it is today, and that collaborative spirit will be key to the success of this plan moving forward.

A healthy environment, strong schools, robust economy, and collaborative governments are the foundational elements of this Resilience Plan. The Plan builds from these strengths, identifies the emerging challenges, and charts a path to our future. This future path was built from the ground up around three visions:

VISION 1

Make the Milwaukee region a better place to live by improving the public's participation in decision making and their environment

VISION 2

Boost the region's economic vitality through innovative job creation and access to equal opportunities

VISION 3

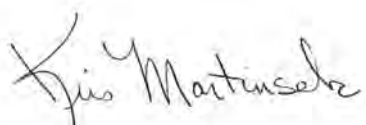
Adapt infrastructure to the challenges of the 21st century

The action steps found in each of these visions will be implemented by many partners over many years, and the Milwaukee Metropolitan Sewerage District (MMSD) is excited to collaborate to do its part.

Providing sustainable, livable employment is one of the great challenges identified in the Resilience Plan. As the Chairwoman of the MMSD Commission, I look forward to MMSD providing leadership associated with addressing the effects of climate change and connecting the under-employed with jobs that will be created through the innovation of our 21st century infrastructure.

The Milwaukee region is on an upward trajectory. Working collaboratively as a region to realize these visions will take us to a more sustainable, resilient future. I hope we can all take part in this experience and move onward.

Sincerely,



KRIS MARTINSEK
MMSD Commission Chair

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The Resilience Plan provides general recommendations for how to address risks that are impacting 28 communities in southeastern Wisconsin. Risks and recommendations were decided on collectively by stakeholders. The recommendations can be implemented individually or integrated into projects. The recommendations are flexible and can be applied at various scales depending on the need and the budget.

Note from the Milwaukee Metropolitan Sewerage District

EXECUTIVE DIRECTOR

KEVIN SHAFER
MMSD Executive Director

Our climate is changing and we need to change with it. Increasingly intense storms in our region make sewer overflows and flooding bigger threats. Incremental steps taken now will help us reduce these risks in the future.

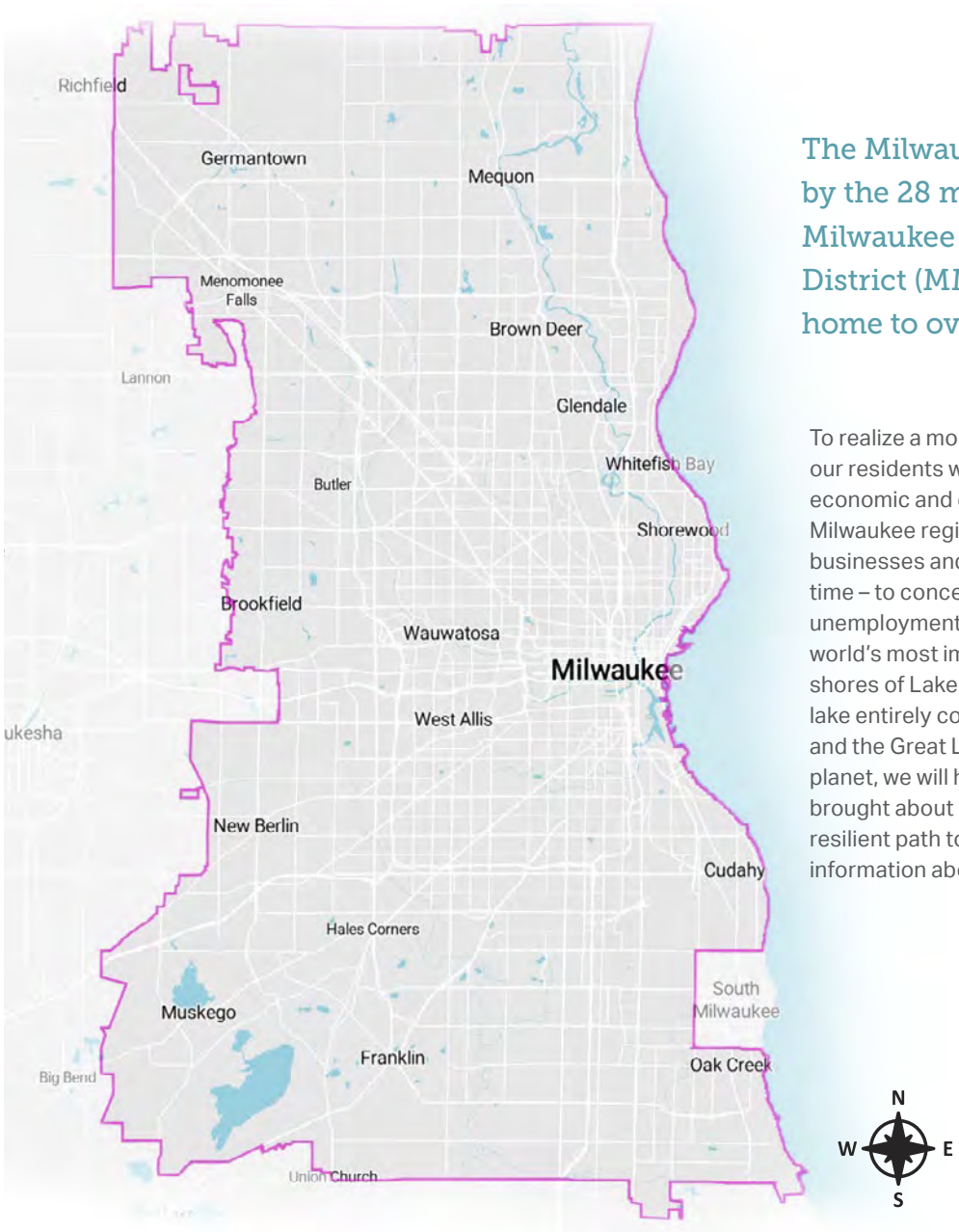
While water flows downhill, adapting to climate change is a dangerous uphill battle. Nevertheless, if each of us takes steps to manage rainwater where it falls, we can reduce the risk of basement and street flooding and the amount of water that leaks into our sanitary systems causing sewer overflows.

PART 1
Resilience Challenges [i]

Part 1

01

BACKGROUND



The Milwaukee region is defined by the 28 municipalities that the Milwaukee Metropolitan Sewerage District (MMSD) serves and is home to over 1.1 million people.

To realize a more sustainable, resilient future for our residents we need to understand the social, economic and environmental climate of the Milwaukee region. Our region is home to flourishing businesses and neighborhoods and – at the same time – to concentrations of poverty and high unemployment. We are located on one of the world's most important natural resources along the shores of Lake Michigan (the largest freshwater lake entirely contained within the United States) and the Great Lakes; yet, along with the rest of the planet, we will have to adapt to the uncertainties brought about by climate change. To chart a more resilient path to our future, here is some basic information about who we are.

Bayside
Brookfield
Brown Deer
Butler
Caledonia
Cudahy
Elm Grove
Fox Point
Franklin
Germantown
Glendale
Greendale
Greenfield
Hales Corners
Menomonee Falls
Mequon
Milwaukee
Muskego
New Berlin
Oak Creek
River Hills
Shorewood
St Francis
Thiensville
Wauwatosa
West Allis
West Milwaukee
Whitefish Bay

By the year 2035 our region is projected to grow by about +16 %

Part 1

02

POPULATION

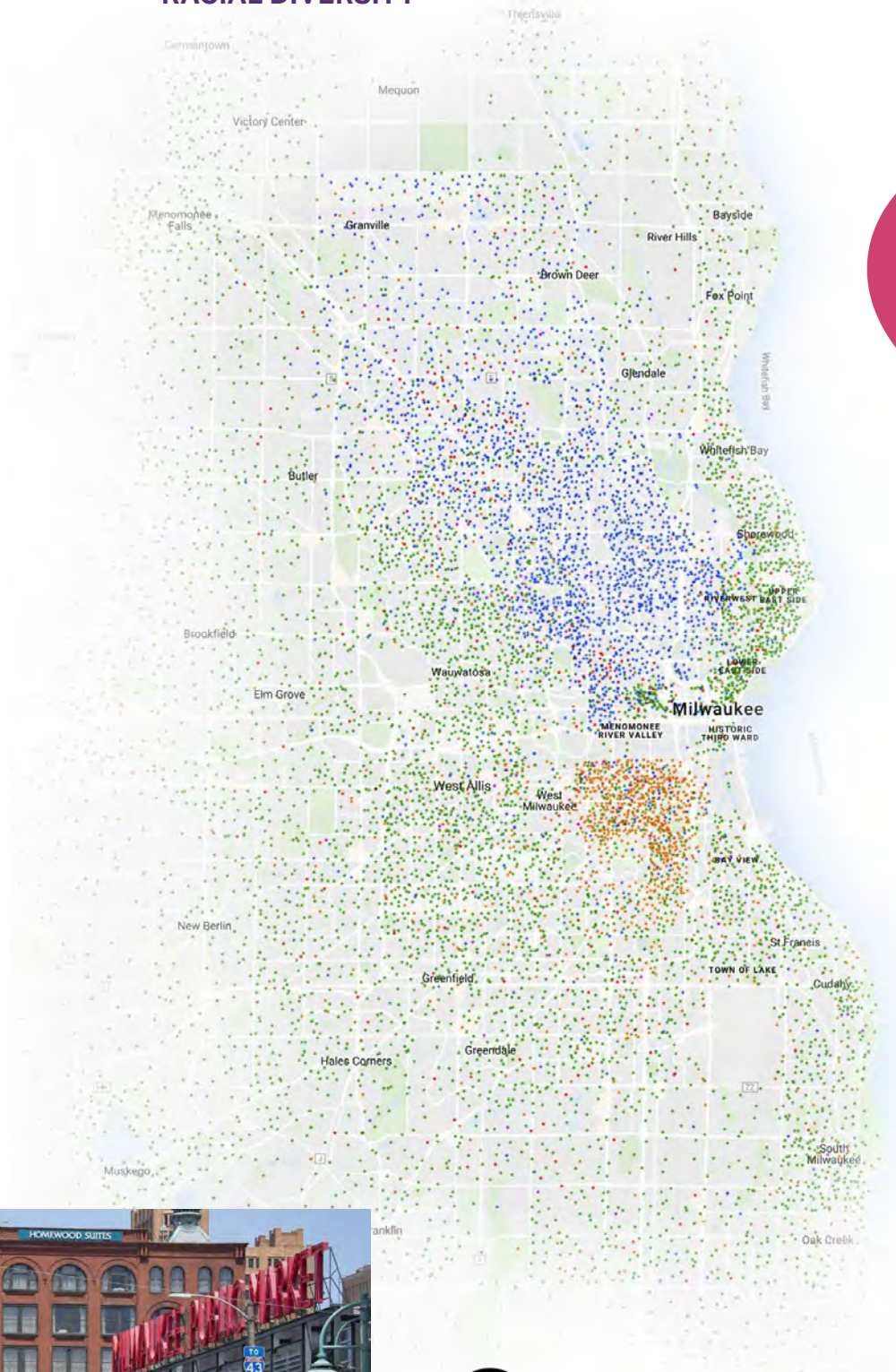
Relatively slow population growth has been one of the challenges facing our region. The Milwaukee region has grown by about 2% since 2000. The full four-county metro area has grown by about 5%. This is somewhat slower than our peer metro areas in the Midwest that have grown on average by about 10% since 2000. It is significantly slower than our peers in other parts of the county, that have grown on average by about 26% since 2000.

The populations of the communities in the Milwaukee region range from about 1,600 residents in River Hills to over 595,000 residents in Milwaukee; however, 18 of our 28 communities have lost population since 2000. Suburban communities such as Oak Creek, Franklin, Muskego, and Menomonee Falls have experienced the most growth in the region since 2000. This population shift and slow growth equate to a reduction in potential property taxes and municipal income that pays for the critical services that communities rely on.

These inequalities are far more pronounced in our region than almost any other large metropolitan area in the country. The four-county Milwaukee metropolitan area has the highest segregation index for black-white segregation (for 2013-2017).[ii] Our minority populations are four times less likely than non-minority populations to have a high school diploma, per capita income for non-minority populations is over two times that of minority populations, and poverty rates are nearly four times higher for minority populations.

Perhaps the greatest challenge facing our region is the continued concentration of minority populations. Nearly two-thirds of City of Milwaukee residents identify as a racial or ethnic minority, while all but three communities in the Milwaukee region report more than 75% white, non-Hispanic populations. The concentration of minority populations aligns with significant disparities in income, poverty rates, and educational attainment between minority populations and non-minority populations.

RACIAL DIVERSITY



COMMUNITY COMMENTS

Often people of color are left out of the conversations that affect their neighborhoods and only looped in after the plan has been developed...Rarely, are people of color given a place at the decision making table.

Map Key

One dot = 120 people

CENSUS GROUP

- Black
- Hispanic
- Asian
- White
- Others

There are also economic and educational disparities between the residents of the City of Milwaukee and some inner-ring suburbs and the outlying communities of our region. These disparities are exacerbated by limited housing and transportation choices that reduce access to opportunities in more affluent outlying communities. Less affluent neighborhoods also experience a reduced amount of neighborhood revitalization, higher rates of crime, and higher rates of unemployment.

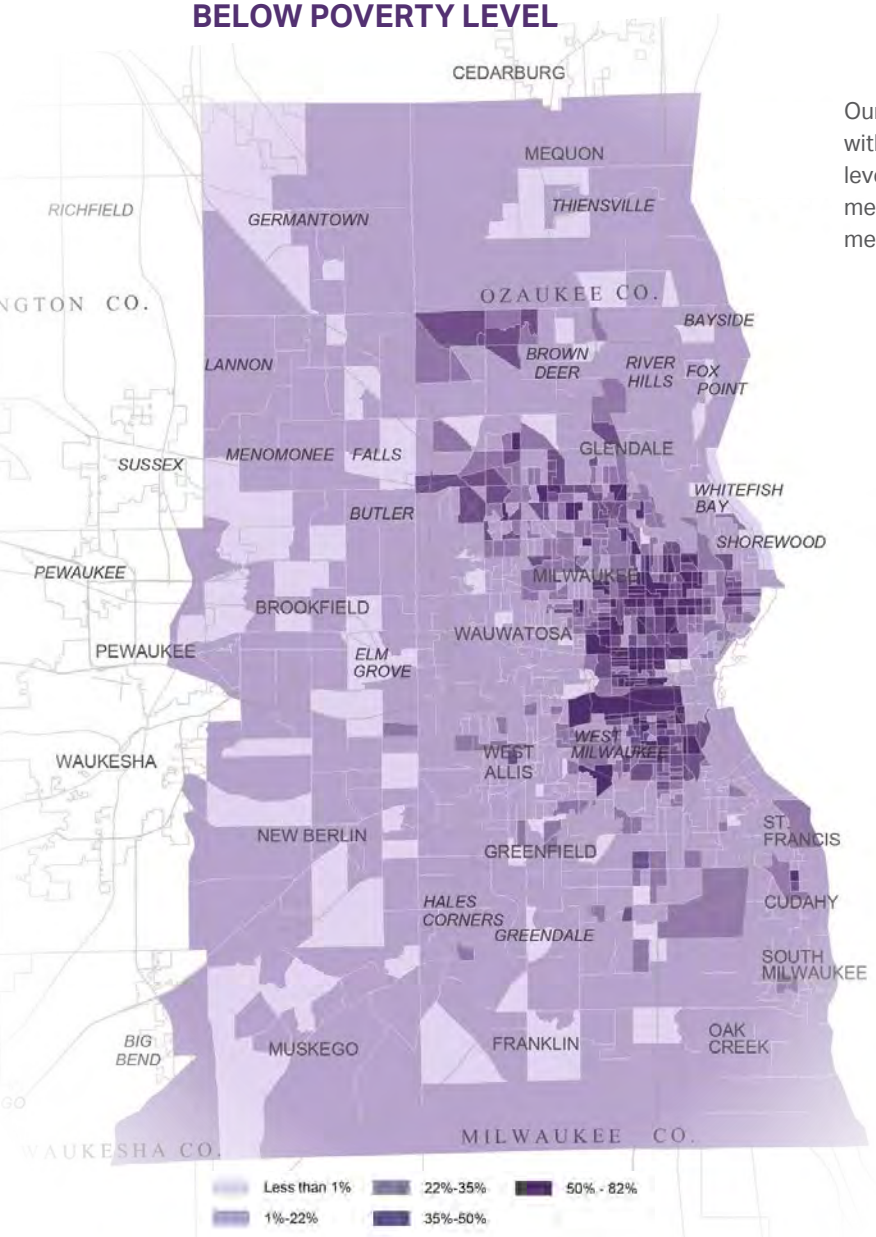
Map: University of Virginia | Weldon Cooper Center for Public Service

Part 1

03

ECONOMY

PERCENTAGE OF POPULATION BELOW POVERTY LEVEL



Our region's relatively slow population growth is coupled with economic challenges including relatively low income levels and long-term job losses. In 2015, the Milwaukee metro area ranked 78th out of the nation's 100 largest metro areas for recovery from the recession.[iii]

COMMUNITY COMMENTS

Engage schools to create more opportunities for students to go into the trades-machinists, electricians, plumbers, etc.

Despite the comparatively slow growth rate, the Milwaukee region has also seen economic success stories with over 25 firms listed in the top Fortune 5000 firms in the country including Northwestern Mutual Life Insurance Company, Kohl's Corporation, WEC Energy Group Inc., and Briggs & Stratton Corporation.[iv] The region's economic future is in part reliant on positioning firms to compete in global markets. Systems like the Port of Milwaukee are already in place to support international trade via an extensive waterway network of over 2,340 miles and over 2 million tons of cargo moving through annually.[v], [vi], [vii]

MANUFACTURING JOBS ARE A CORE RUNG ON THE REGION'S LADDER OF OPPORTUNITY

There are

149,300

manufacturing jobs in the region representing 16% of regional employment.

manufacturing jobs are a core rung on the region's ladder of opportunity, paying

+31%

more than the average job in the region.

Unemployment rates can indicate the health of an area's economy. Although most of the region is experiencing record low unemployment, the unemployment rate is currently higher in parts of the region with higher concentrations of minority populations.

The types of jobs available matter, too. According to the Milwaukee Region's Global Trade & Investment Plan, "...manufacturing in the region accounts for 149,300 jobs, or 16% of regional employment, making the Milwaukee region second for manufacturing intensity among the top 50 U.S. metropolitan areas. Moreover, manufacturing jobs are a core rung on the region's ladder of opportunity – paying 31% more than the average job in the region."[viii] With an unemployment rate for minorities at 12.2%[ix], there is job opportunity in skilled manufacturing such as machinists, technicians, and engineers. Currently, the workforce is not able to meet the demand and the gap poses a threat to the region's economic growth.[x]

A significant challenge is the ability to pay for the critical services (such as police, schools, waste collection, water infrastructure, etc.) people need. Levy limits imposed in 2005 connect how much a municipality can levy in property tax to net new construction. With most municipalities seeing construction rates at less than 1.5%, municipal governments are limited in the amount of property tax they can collect to pay for critical services.[xi] This is particularly concerning to communities in the Milwaukee region that have little developable land and have to rely on infill development and redevelopment for new construction to occur.

Part 1

04

CLIMATE CHANGE

The Earth's climate has always changed. Science tells us that the Earth's climate is now changing much more rapidly than ever before. Climate change is caused by natural factors such as volcanic eruptions, changes in the Earth's orbit, changes in how much energy is released from the sun and now human factors contribute, too, according to the U.S. Environmental Protection Agency. For most of human history, the Earth's atmosphere contained about 275 parts per million of carbon dioxide. More recently, the Earth's atmosphere has been found to contain about 390 parts per million of carbon dioxide...and that number is rising by about 2 parts per million each year. Most scientists (97%) agree that our carbon emissions are likely influencing the Earth's climate. This influence affects the Earth's rainfall patterns, temperature, plant and animal populations, and more. In an urban environment, the impacts of these changes can be magnified because of dense development and more complex infrastructure.

-- MMSD Sustainability Plan 2012

> ...ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth — all while tackling climate change and working to preserve our oceans and forests.
>
> *-United Nations Sustainable Development Goals*

Climate change puts additional stress on our critical infrastructure when it must be maintained, improved, and expanded in an uncertain financial and physical environment. Critical infrastructure includes systems which are socially, economically, or operationally essential to the functioning of a society or community.[xii] These systems can include transport, electricity, water and communication systems. Ensuring that infrastructure is climate resilient will help reduce direct losses and reduce disruption of service.[xiii]

Projections

Based on climate projections, there will be seasonal impacts on our region. Winter months are predicted to be warmer, with more precipitation occurring as rain instead of snow. This may mean an increase in freezing rain storms, and those will cause problems for transportation, above-ground power lines, and other infrastructure. The projections tell us that the number of large rainstorms (greater than two inches of rainfall in a day) will increase by 25% and occur predominantly in the spring and fall. What's more, this trend is already happening. The Milwaukee region storms of 2000, 2002, 2005, 2006, 2008, 2009, 2010, 2012, 2013, 2015, 2016, and 2018 produced significant flooding, basement backups, and sewerage overflows that caused millions of dollars in damage. These large storms demonstrate that the region's existing grey infrastructure, that includes traditional sanitary and storm sewer systems, was not designed for these larger events.[xiv]

An important part of our infrastructure is our transportation system that connects our residents with employment, education, health care, and other important services. While our region is slow growing compared to other large metropolitan areas, our population is still projected to increase by about 16% by the year 2035. This will require not only replacing, but also improving and expanding an already aging transportation system. Roadway condition and traffic flow are critical factors to the growth of our region's

>>>

Part 1 04

CLIMATE CHANGE

>>> economy and the safety of our residents. A financial analysis completed for the regional transportation plan (VISION 2050) shows that expected revenues will be insufficient to reconstruct major roadways, particularly our freeway system, as recommended in the plan by the year 2050.[xv] This may have a negative impact on commerce and safety in our region.

And it's not just about transportation. Looming changes in the environment will also have repercussions for all types of infrastructure. The Intergovernmental Panel on Climate Change has concluded that the Earth is experiencing climate change, with an increase in average surface temperature that has been linked to changes in precipitation patterns and storm severity. The possible effects of climate change on Wisconsin were investigated by the Wisconsin Initiative on Climate Change Impacts and found the Milwaukee region may experience a warmer and wetter climate by mid-century, with an increased frequency of large storm events.[xvi] This may result in more flooding, more sewer overflows, more polluted stormwater, reduced air quality, and extreme heat.

WHAT DOES THIS ALL MEAN?

The data illustrate that socio-economic issues such as social equity and environmental problems such as climate change pose some of the greatest risks to the resilience of our region. These two sets of issues are on a collision course over the next several decades without this plan. For instance, critical infrastructure (water mains, sewerage pipes, and energy lines) are connected systems that become increasingly vulnerable with increased precipitation, disinvestment, and population growth. While these risks could hinder the resilience of our region in the face of a "perfect storm," the data also show that our region is comprised of a diverse array of neighborhoods and communities. The actions recommended in the Resilience Plan can help build upon the strengths of our communities and natural resources to make the Milwaukee region an attractive and inclusive place for all residents.

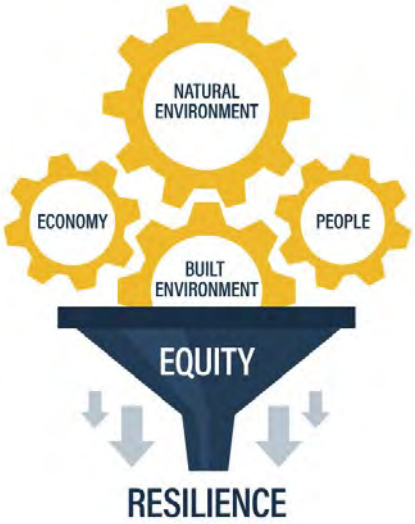
PART 2

Why A Resilience Strategy?

Part 2

01 URBAN AREAS

Our urban areas are complex and constantly adjusting to changes.[xvii] In particular, climate changes are driving the need to adaptively plan to manage the risks and reduce the impact to our communities.



Changes in the climate are likely to cause prolonged periods of heat, less severe winters, floods, droughts and heavy precipitation events in this region.[xviii],[xix],[xx] Our urban areas will continue to see population increases that are projected at an additional 16% by 2035,[xxi] and our critical infrastructure is stressed and in need of repair.[xxii] We must plan for this, and plan in a new way.

Previously, a problem or risk was identified, and a plan was made to 'fix' the problem. Today, we see our risks connected to each other, and creating a 'fix' is more difficult because these connections have a cascading impact within a broader system where social, economic, environmental, and financial risks are connected.[xxiii] Addressing these risks in a comprehensive and creative way is more important now than ever. Resilience planning looks holistically and proactively at how these systems interact. It creates integrated, inclusive and robust responses through recommended actions.[xxiv]

Urban areas depend on critical infrastructure systems (power, drinking water, wastewater, and communications) functioning properly. Those systems are dependent on each other and are equally vulnerable to changing urban conditions such as fluctuations in temperature and rainfall, varying land use conditions, population influxes, and poverty rates. Therefore, the risks herein are addressed and understood as they relate and correlate to other components of the built, natural and social environments. Oftentimes, a disturbance within one area of infrastructure will result in an impact or disruption in other areas.

Increasing demand on natural resources, infrastructure, and public services challenges cities' sustainable development and economies. Smarter planning, development and management of infrastructure and

WHAT IS CLIMATE RESILIENCE?

Climate resilience is the ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate. Improving climate resilience involves assessing how climate change will create new, or alter current, climate-related risks, and taking steps to better cope with these risks.[xxvii]

The purpose of the Resilience Plan is the identification, evaluation, and prioritization of risks followed by coordinated and economical application of recommendations to minimize, monitor, and control the probability or impact of unfortunate events or to maximize the realization of opportunities.

Regional Planning is...

A necessary governmental function in large metro areas across the country because development and infrastructure problems often transcend the political boundaries and fiscal capabilities of individual communities. A regional approach is necessary to provide efficient, cost-effective public works systems...Regional planning is also a sound approach to address issues such as flooding, air and water pollution, changing land use, and preserving natural and agricultural resources.

—About SEWRPC Handout, March 2018

public services for our cities will be an absolute necessity. The American Society of Civil Engineers cites the lack of investment in infrastructure as an impediment for Wisconsin to compete in an increasingly global marketplace.[xxv] Wisconsin needs to invest $1 billion in drinking water infrastructure and $6.33 billion in wastewater infrastructure over the next 20 years.[xxvi]

Cities across the world are developing resilience plans to proactively prepare communities to take on the systematic and intertwined risks facing populations today for a stronger future tomorrow. Prioritizing risks and strategies to reduce those risks is becoming a matter of importance for utilities, municipalities, and private and public partners.

Public, non-profit, and private partners will continue to fund crucial services and projects. The Resilience Plan is a guide with agreed-upon risks and actions that can be used to respond to the ever-changing environmental and social conditions in an uncertain financial future. We must broaden our perspectives and see that our problems, solutions and responsibility to act are connected.

Part 2

02 OUR PROCESS

Reinventing the wheel was not required for this effort! The planning effort used two tried-and-true processes to involve leaders who, in turn, identified strategies:

No. 1 **THE 100 RESILIENT CITIES EFFORTS,** a Rockefeller Foundation-supported initiative, develops a road map for cities, engages a broad range of stakeholders, identifies priorities, and creates an actionable set of initiatives. The project team completed an extensive review of existing **100 Resilient Cities** plans as well as local plans to identify and incorporate the best components into a single strategy while filling identified gaps. The project team used the City Resilience Framework to group the essential systems of cities into four areas: **Health & Wellbeing**; **Economy & Society**; **Infrastructure & Environment**; and **Leadership & Strategy.**[xxviii]

No. 2 COMMUNITY RESILIENCE BUILDING WORKSHOPS

is a structured process that identifies and prioritizes actions that accelerate resiliency. This process was developed in part for The Nature Conservancy and has been used in over 45 municipalities. This community-driven process facilitates dialogue and decision making by using a risk matrix to define risks, identify vulnerabilities and develop and prioritize actions for the community. This process ensures that all voices are heard and results in consensus among diverse stakeholders.

Meaningful participation for this planning effort from community representatives was crucial to:

- Ensure previous plans and stakeholder goals were included
- Understand how the good work happening now can be scaled up and used by all
- Create a consensus future goal

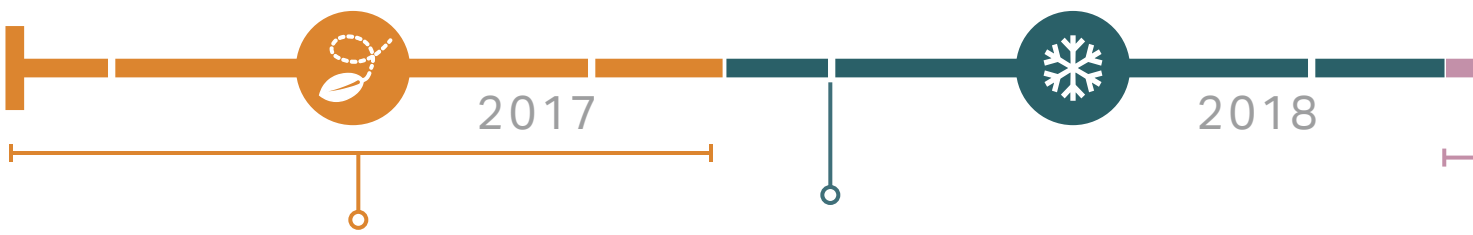
The project team gathered information using a variety of techniques including individual interviews, case studies, online surveys, and stakeholder workshops. Participants fell into two groups: municipal representatives and community representatives from public, private, nonprofit, utility and academic institutes from across the greater Milwaukee area.

Part 2 02

OUR PROCESS

TIMELINE

Over the course of 12 months, the project team completed the following:



2017 / FALL → 2018 / WINTER

LITERATURE REVIEW

The team completed a review of over 45 local, regional, state, national and international planning documents to identify best practices.

2017 / FALL

STAKEHOLDER INTERVIEWS

Representatives from all 28 municipalities were invited to participate in this process and included mayors, village presidents, engineers, and planners. The project team completed 17 interviews, representing 22 municipalities, to better understand the unique challenges, opportunities, and assets for each community. The challenges were synthesized during the development of the risks.

Identified community assets include:

- Relationships & collaborations with other municipalities
- Lake Michigan & area rivers
- Municipal employees
- Strong community leaders & organizations
- People living in the communities & diversity
- Sense of community
- Affordable housing

2017 / DECEMBER

RISK WORKSHOP

The project team held workshops to review the methodology used to identify the risks, prioritize the top 12 risks, and determine the top six risks. The workshop included both small and large group exercises and discussion.

The goals of the workshop were to:

- Understand the implications and connections between risks
- Discuss strengths and vulnerabilities of municipalities
- Identify initial opportunities to reduce the impacts from risks

ONGOING

ADVISORY COMMITTEE

The Advisory Committee included representatives from universities, planning agencies, utilities and community leaders who provided direction during the planning process. The group served as a sounding board for strategy and advocates for engagement in the planning process within the communities.

2018 / SPRING

ACTION PRIORITIZATION WORKSHOP

The project team identified 35 actions as the most relevant strategies to address the risks. During the workshop, stakeholders narrowed down the actions that should be considered as priorities in the Plan. Participants scored each action according to feasibility (i.e., how difficult the action is to implement) and level of impact (i.e., how effective the action would be in decreasing the risk, increasing quality of life, and providing cost savings). Each participant then ranked each action as: should be included in the Plan, may be included, or not included at all. Each participant had an equally weighted vote, and after all the votes were aggregated, the team identified the top 20 actions.

2018 / SUMMER

DIGITAL COMMUNITY SURVEY

A digital survey was conducted to ensure that community members were able to weigh in on which actions should be a priority. 144 participants provided input and chose the top two priority actions in each Vision category:

VISION 1

- Improve Public Spaces, Community Health And Reduction In Crime Through Sensible Environmental Design
- Accelerate Local Efforts To Improve Communities By Replacing Grey Impervious Surfaces With Green Space

VISION 2

- Create A Job Training/Shadow Program With The Schools And Major Employers In The Region
- Support The Creation Of/And Training For Jobs Related To Sustainability In Specific Industries And Trades

VISION 3

- Increase Green Infrastructure In The Region
- Integrate Energy, Waste, And Sustainable Material Components Into RFPs And/Or Bids

Part 2 02

OUR PROCESS

>>> The Resilience Plan helps us understand how our investments can be leveraged to reduce the risks associated with climate change and fiscal constraints, and the overall benefits of social wellbeing.

Why MMSD?

As a regional government agency, the Milwaukee Metropolitan Sewerage District (MMSD) understands the need for reliable infrastructure systems. MMSD plans for replacement of equipment, maintenance of the system, and adjustments to how we operate. Increasingly, we see that factors external to our systems such as rainfall, population changes, and changes in land use impact our ability to deliver service...and this will only continue. MMSD undertook and led the development of the Resilience Plan because understanding the external risks driven by climate change and shifts in the urban environment are crucial to our ability to provide reliable and cost-effective services. We understand that for every dollar spent on infrastructure there is an impact on social, environmental and economic components of the region.

Prioritizing the top risks and actions across the region helps identify where MMSD and other agencies could make a difference. Although the Resilience Plan addresses the top risks, MMSD will only invest in the actions that have a benefit to a risk related to our infrastructure. We hope that through the development of this plan, the stakeholders involved will take ownership of the actions related to their goals through implementation. Stakeholders came from all sectors, and through this planning effort have agreed on the risks and actions needed to improve our communities. Addressing these issues will only happen through structured collaboration and commitment.

The core focus of any clean water agency is to be a well-run utility that meets or exceeds its public health and environmental obligations, provides value to its ratepayers, is a responsible steward of its assets and is financially sustainable. A changing climate creates greater uncertainty regarding future conditions and can make each of these factors more challenging—making resilience planning imperative."[xxix]

— NACWA Principles On Climate Adaptation & Resiliency

Part 2

03

RISK IDENTIFICATION

The process was complicated, but well worth it!

Managing risks starts with identifying and estimating the probability and impact of given threats.[xxx] The project team (consisting of Veolia, MMSD, Southeastern Wisconsin Regional Planning Commission (SEWRPC), and The Nature Conservancy) identified as many risks as possible through stakeholder interviews and a comprehensive plan review. The project team then ranked the risks by likelihood and negative impact. During the workshop, the top 12 risks were presented and stakeholders prioritized and chose the top six risks for the focus of this planning effort.

COMMUNITY COMMENTS

Engage stakeholders in a way that they realize their individual decisions and help water quality overall.

Here is the process:

No. 1 RISKS IDENTIFIED FROM STAKEHOLDER INTERVIEWS

Interview participants identified the following hazards facing their communities (listed in alphabetical order):

- Aging infrastructure
- Drinking water supply
- Economic hazards—availability of jobs, getting people to jobs, succession planning and filling middle-level positions
- Flooding and extreme weather events
- Impacted quality of life—potentially from increased traffic and lack of services that residents want
- Limited public financing—due to State levy limits

No. 2 COMBINED ALL RISKS AND STARTED TO GROUP INTO CATEGORIES

The project team combined risks identified from the qualitative interviews with the comprehensive list of risks identified during the plan review. During the plan review more than 200 individual preliminary risks were identified and categorized according to The City Resilience Framework categories (Health & Wellbeing; Economy & Society; Infrastructure & Environment; and Leadership & Strategy). Examples of the 200 individual preliminary risks include financial gaps, crime and violence, pollution, inadequate public transportation systems, welfare system failure, water supply failure, and floods.

>>>

Part 2 03

RISK IDENTIFICATION

>>> **No. 3**

Risk Board

ASSIGNED VALUES OF FREQUENCY, LIKELIHOOD, AND CONTROL TO RISKS

Each of the 200 risks was evaluated based on three parameters. The parameters include potential impact, likelihood/frequency, and level of control. The potential impact (the effect of the risk occurring in the most likely scenario) was scored based on how a risk would affect finances, population and/or the environment. The likelihood/ frequency describes how often a risk may occur. The level of control relates to the current risk-mitigation activities that are in place to address a risk. Lastly, the risk was given a correlation score. This score evaluated how strongly a risk was connected with another risk. For example, vulnerability of critical infrastructure is impacted by climate change. If pipes are designed to take in one unit of rain but the rainfall consistently is three units, then climate change impacts the ability for the pipes to function properly. Each score was entered into an equation that produced a single combined score. The risks that had the highest combined score were the top 12 risks for the region.

	Specific Risks	Impact	Frequency	Criticality (I x F)	Level of Control	Correlation (x)	Correlation (y)	Scoring incl. Correlation
1	Financial constraints	2.85	3.71	10.22	2.73	0.36	0.39	8.11
3	Social equity	3.43	04.04	13.72	3.23	0.09	0.36	7.75
	Efficiency of mitigation plans	3.11	4.25	13.38	3.57	0.61	0.32	7.75
2	Vulnerability of critical infrastructure	3.55	2.98	10.35	3.29	0.36	0.48	7.02
	Effectiveness of emergency and crisis management	3.12	2.65	8.01	3.06	0.45	0.27	6.05
4	Climatic hazard	2.78	2.56	7.13	2.80	0.32	0.09	5.25
	Soil and water pollution	2.38	3.50	8.31	3.25	0.11	0.32	5.00
5	Ability to adapt and respond to job market changes	2.69	3.88	10.38	3.88	0.25	0.25	4.81
	Suburban sprawl	2.04	3.77	7.65	3.70	0.43	0.20	4.25
6	Distribution of public services	1.93	3.55	6.99	3.93	0.32	0.32	3.89
	Water quality and supply security	2.64	1.87	4.44	3.46	0.27	0.30	3.82
	Access to healthcare system	1.81	3.25	6.47	4.47	0.20	0.50	3.07

Action Workshop

COMMUNITY

Develop process to look at the array of workforce development efforts and needed training at a systems level to better address the need for family supporting jobs and to fulfill employer needs for trained employees.

COMMENTS

No. 4 RISK WORKSHOP TO VET TOP 12 RISKS AND COME TO CONSENSUS ON TOP SIX

Participating stakeholders ultimately determined which risks should be the focus of the plan. Information about the risks presented during workshops included methodology, correlation, descriptions and background information. Through a guided process, each stakeholder chose their top five risks and discussed their decisions as a small group.

The group came to consensus that the most pressing risks, in order of priority, are:

FINANCIAL CONSTRAINTS

Budget constraints due to tax policy (infrastructure investment, public workforce shortage, etc.).

SOCIAL EQUITY

Social issue due to segregation: inequalities, crime and violence.

VULNERABILITY OF CRITICAL INFRASTRUCTURE

Risk associated with aging infrastructure and infrastructure failure (pipes, buildings, bridges, highways, communication networks, industrial areas, etc.), significant and rising costs of maintenance and repair.

CLIMATIC HAZARD

Climatic events (flooding, electrical storms and tornadoes, cold snaps) which impact existing assets.

ABILITY TO ADAPT TO JOB MARKET CHANGES

Risk of non-alignment of skills, competencies and demand. The need to maintain local skills and human capital (competitive workforce training and regional attractively) to an evolving labor market.

DISTRIBUTION OF PUBLIC SERVICES

Ability of public services to meet basic needs (accessibility, equitability and effectiveness).

Part 2

04

DEVELOPING ACTION STRATEGIES

The identified actions are intended to be a menu of strategies that can be implemented by public, private and non-profit partners. The recommendations can be implemented individually or integrated into projects. The recommendations are flexible and can be applied at various scales depending on the need and the budget.

These actions, some of which are already underway, continue and expand existing efforts and adapt best management strategies used in other resilient communities for the risks and needs in the region. Implementation of the actions is intended to happen on an ongoing basis and the actions can be integrated into existing plans/projects or be implemented as a standalone strategy. The visions (categories) and accompanying actions address the range of critical risks at different scales. The goal is that as stakeholders implement actions, the risks will decrease over time because everyone is moving towards the same risk reduction goals.

COMMUNITY COMMENTS

Provide more online/ social media avenues for residents to voice their opinion on public spending issues. Attendance at public meetings is difficult.

Nothing moves forward without strategies.

>>>

Part 2 04

DEVELOPING ACTION STRATEGIES

Action Workshop

>>> The actions were selected using the following process:

1 Urban Review

Review of 36 urban resilience plans from around the world resulted in the identification of 200 potential actions that would address the six risks.

2 State Review

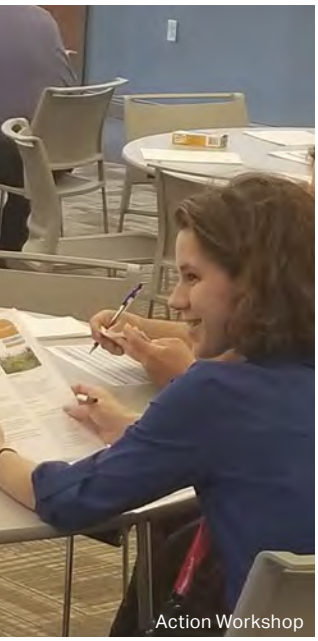
Review of 70 state, regional, and municipal plans were used to match recommendations identified in other plans to the 200 identified actions.

3 Present

Present top 30 actions to the Advisory Committee and refine based on feedback.

4 Assess

Assess the actions for level of impact, scale of implementation necessary to address the risk, and regional applicability.


Action Workshop

5 Categorize

Categorize the 30 actions by Vision in alignment with the 100 Resilient Cities categories.

VISION 1 Environment & Society

Make the Milwaukee region a better place to live by improving the public's participation in decision making and their environment

VISION 2 Economy & Society

Boost the region's economic vitality through innovative job creation and access to equal opportunities

VISION 3 Infrastructure & Environment

Adapt infrastructure to the challenges of the 21st century

6 Refined 30 actions presented at Action Workshop where stakeholders prioritized each action for impact, feasibility and consideration to include in plan (yes, no, maybe)

Regional Infrastructure Resilience Plan: Vision-Initiative-Action Score Card

Vision - Initiative - Action	High	Med	Low	High	Med	Low	YES*	Maybe	NO
Vision #1									
1.1.1 Identify the Gaps in Partnerships and/or Employment Sectors to Create Stakeholders Relationships	X				X			X	
1.1.2 Create a Regional Resilience Resource Center - Space for Consolidated Community Resources	X			X			X		
1.1.3 Develop A Climate Risk Engagement Campaign		X			X			X	
1.1.4 Engage Stakeholders in Collaborative Decision Making - Watershed Restoration/Water Quality Plans		X				X		X	
1.2.1 Accelerate Local Efforts to Improve Communities - Replace Impervious Surfaces with Green Spaces	X			X			X		
1.2.2 Launch an Urban Farming project at the South Shore Waste Reclamation Facility			X			X		X	
1.2.3 Add Addititional Healthy Food Programs - Access to Fresh, Locally Sourced Foods		X			X			X	
1.2.4 Improve Public Spaces, Community Health, Reduce Crime through Sensible Environmental Design	X			X				X	
1.2.5 Increase Value Of Existing Resources (Such As 286 - City) By Improving Access, Adding Necessary Organizations/Services, And Connecting Residents Quickly		X			X			X	
1.2.6 Expand Litter Pickup Programs - Change Behaviors through Targeted Communications Campaigns		X			X				
Vision #2									
2.1.1 Launch a Utilities Efficiency Program to Improve Low Income Housing and Boost Employment		X				X			
2.1.2 Create a Job Training/Shadowing Program with Schools and Major Employers in Region			X		X			X	
2.1.3 Develop Entrepreneurship Opportunities with Direct Links to Water and Energy Technologies that meet Future Job Needs			X			X		X	
2.1.4 Facilitate Development of Social Enterprise Sector through "Pop-up" Projects		X			X			X	
2.1.5 Support Creation of and Training for Jobs Related to Sustainability in Specific Industries and Trade		X		X			X		
2.2.1 Create Pathways to Career Success for Young Men and Women of Color		X			X			X	
2.2.2 Design a Suite of Inclusive Economic Development Services to Help Entrepreneurs of Color Gain Equal Footing in Milwaukee Region's Economy			X			X		X	
2.2.3 Advance Racial Equity in Private Sector	X				X			X	
2.2.4 Create "Colaboratorios" as Public Experimentation Workshops		X				X		X	

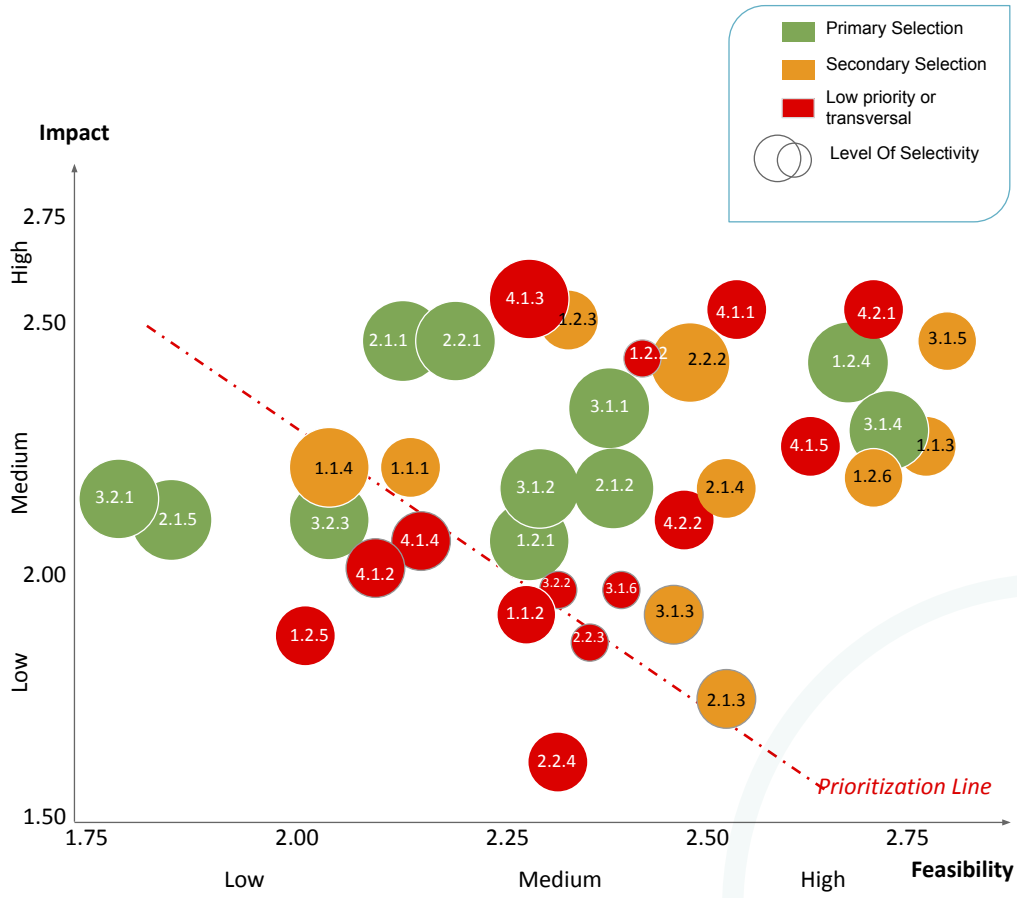
** Please no more than 10 "X"s in the "Yes" column.*

^ Vision - Initiative - Action score card sample

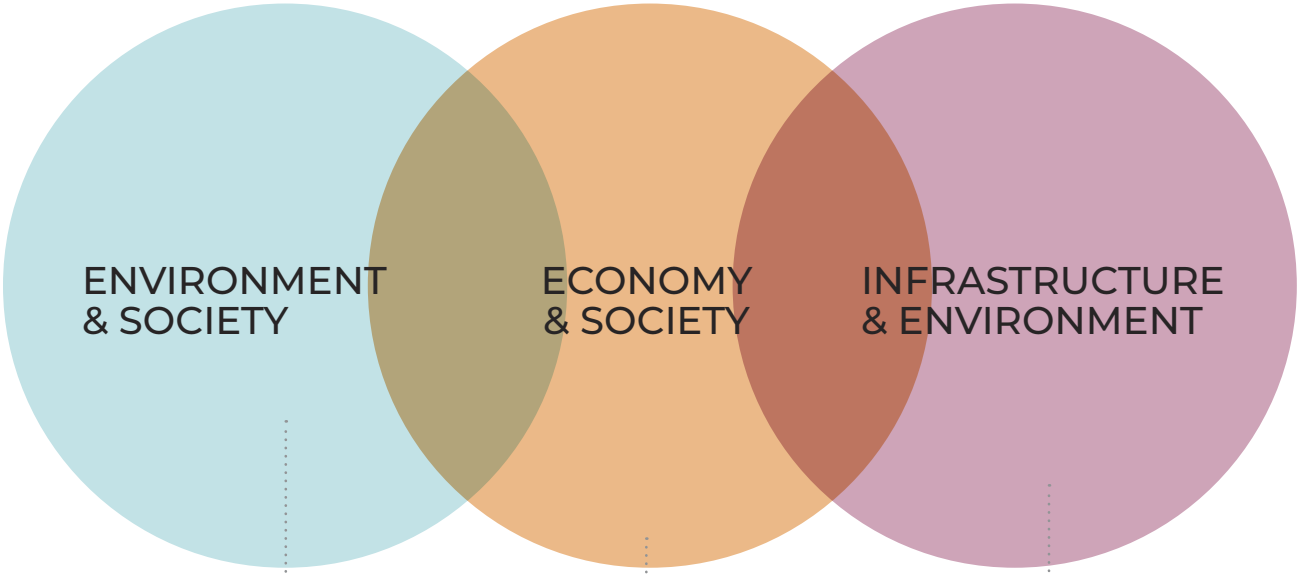
Part 2 04

DEVELOPING ACTION STRATEGIES

>>> **7** Qualitative rankings were given numerical values and ranked on an action feasibility and impact matrix that showed a fully weighted score and allowed the project team to identify the most highly prioritized actions



8 Resulting top 20 actions are the Resilience Plan recommendations



VISION 1

1 Identify Gaps That May Exist In Current Partnerships And/Or Employment Sectors To Create More Meaningful And Intentional Stakeholder Relationships

2 Create A Regional Resilience Resource Center That Can Serve As A Space For Consolidated Community Resources

3 Engage Stakeholders In Collaborative Decision Making And Implementation Of Watershed Restoration & Water Quality Plans

4 Accelerate Local Efforts To Improve Communities By Replacing Grey Impervious Surfaces With Green Spaces

5 Add Additional Healthy Food Programs So More Residents Have Access To Fresh, Locally-Sourced Foods

6 Improve Public Spaces, Community Health And Reduce Crime Through Environmental Design

7 Increase Access To And Understanding Of Existing Resources By Connecting Residents To Available Community Resources

8 Expand The Existing Litter Pickup Programs And Change Behaviors Through Targeted Communication Campaigns

VISION 2

9 Launch A Utilities Efficiency Program To Improve Low-Income Housing And Boost Employment

10 Create/Connect Job Training / Shadowing Program With The Schools And Major Employers In The Region

11 Develop Entrepreneurship Opportunities With Direct Links To Water And Energy Technologies That Meet Future Job Needs

12 Support The Creation Of And Training For Jobs Related To Sustainability In Specific Industries And Trades

13 Create Pathways To Career Success For Young Men And Women Of Color

14 Design A Suite Of Inclusive Business Development Services To Help Entrepreneurs Of Color Gain Equal Footing In The Milwaukee Region's Economy

VISION 3

15 Develop And Implement Sustainable Practices Through Bids And Businesses Across The Region

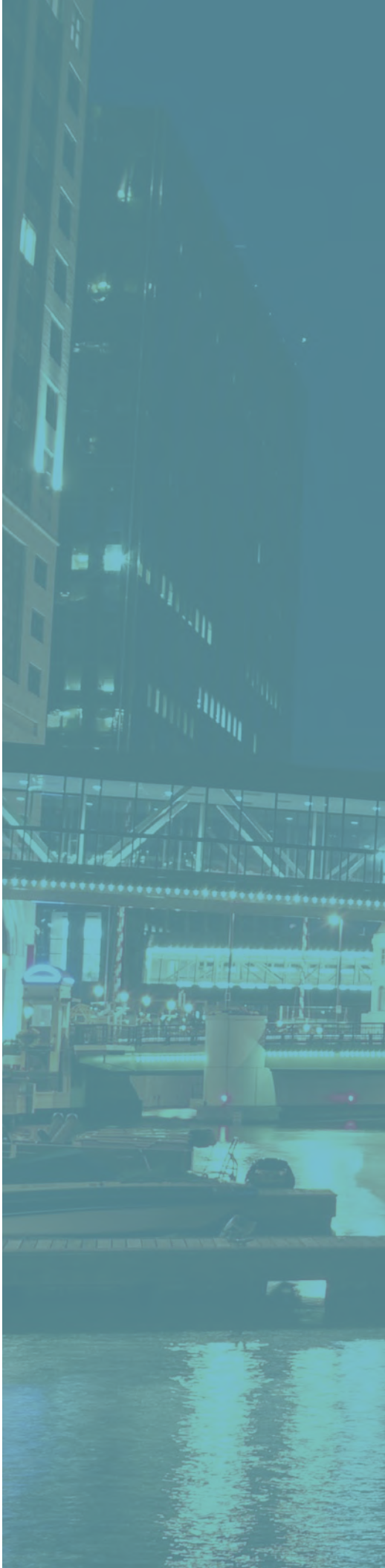
16 Drive A Regional Energy Efficiency Program

17 Assess The Reliability Of Critical Infrastructure By Performing A Criticality Analysis

18 Establish A Policy Review And Response Mechanism

19 Increase Green Infrastructure In The Region

20 Develop And Implement A Plan To Make Critical Infrastructure Around Water Systems Cyber Resistant



PART 3

Visions and Action Strategies

Part 3

01

ACTION STRATEGIES

The following section details the 20 actions chosen by stakeholders. The actions are grouped into three vision categories and have focus areas that are in-line with the 100 Resilient Cities focus areas.

1

VISION 1 ENVIRONMENT & SOCIETY

focuses on creating a path toward increasing well-being for community members by mobilizing them around key issues and by improving the quality of public spaces and services. The actions focus on addressing the environment and society.

2

VISION 2 ECONOMY & SOCIETY

looks to improve access to jobs by creating and connecting people to current and future opportunities to close the wealth gap and ensure that quality of life is not determined by race or ethnicity. The vision is to create a community in which intergenerational wealth-building opportunities are accessible to all and that youth are connected to educational opportunities that prepare them for their careers. The actions focus on addressing the economy and society.

3

VISION 3 INFRASTRUCTURE & ENVIRONMENT

understands that infrastructure (both new and aging) strain budgets and can limit the growth potential for businesses and communities. Innovation and new technologies have the potential to save time and money and individually contribute to resilience. But to have a truly resilient region, new systems must be created and old ones adapted. This vision takes a collaborative approach on adapting critical infrastructure to the challenges of the 21st century to mitigate risk, optimize assets, and enhance the quality of life. The actions focus on addressing infrastructure and the environment.


VISION 1
VISION 2
VISION 3
1 Identify.
2 Create.
3 Engage.
4 Improve.
5 Access.
6 Design.
7 Connect.
8 Expand.
9 Launch.
10 Connect.
11 Develop.
12 Support.
13 Create.
14 Design.
15 Implement.
16 Drive.
17 Assess.
18 Establish.
19 Increase.
20 Plan.

01

ACTION STRATEGIES

VISION 1

Make the Milwaukee region a better place to live by improving the public's participation in decision making and their environment.

Action Pages

On the following pages each action includes a goal, an objective, risks addressed (identified by the icon in the upper left corner), as well as the status and suggested lead. The Plan is meant to be a guide, rather than a prescription and stakeholders will play varying roles in implementation.

Actions

Improve dialogue with residents and key stakeholders

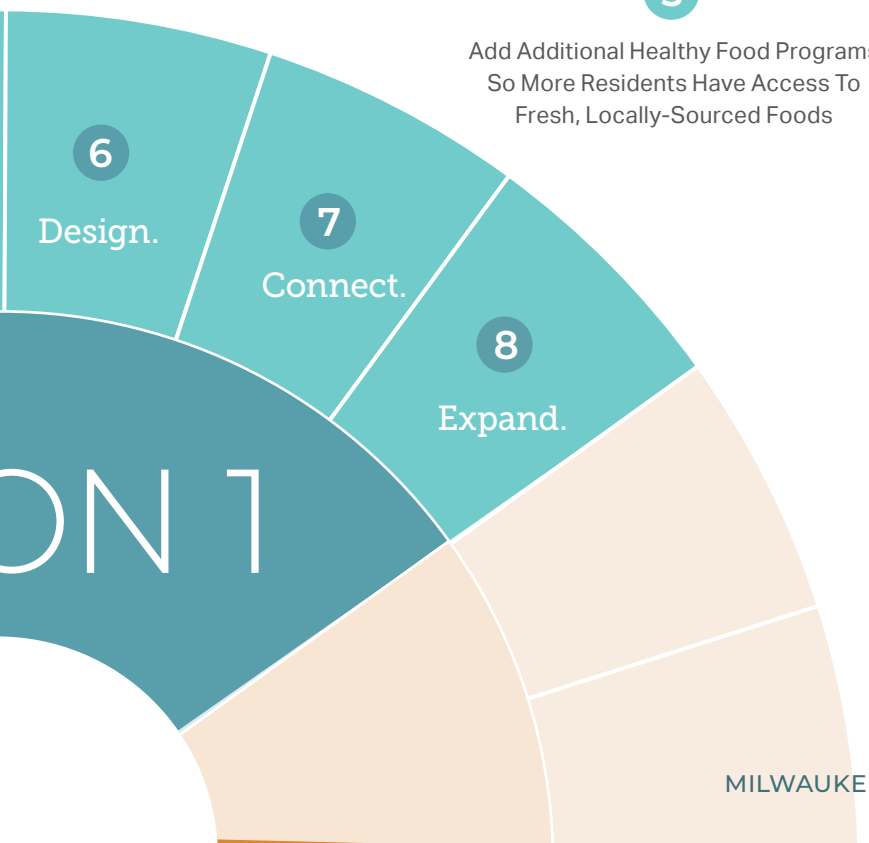
1. Identify Gaps That May Exist In Current Partnerships And/Or Employment Sectors To Create More Meaningful And Intentional Stakeholder Relationships

2. Create A Regional Resilience Resource Center That Can Serve As A Space For Consolidated Community Resources

3. Engage Stakeholders In Collaborative Decision Making And Implementation Of Watershed Restoration & Water Quality Plans

4. Accelerate Local Efforts To Improve Communities By Replacing Grey Impervious Surfaces With Green Spaces

Promote a safe and sustainable community



5. Add Additional Healthy Food Programs So More Residents Have Access To Fresh, Locally-Sourced Foods

6. Improve Public Spaces, Community Health And Reduce Crime Through Environmental Design

7. Increase Access To And Understanding Of Existing Resources By Connecting Residents To Available Community Resources

8. Expand The Existing Litter Pickup Programs And Change Behaviors Through Targeted Communication Campaigns

Action 1

Identify Gaps That May Exist In Current Partnerships And/Or Employment Sectors To Create More Meaningful And Intentional Stakeholder Relationships

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

SOCIAL EQUITY

ABILITY TO ADAPT TO JOB MARKET CHANGES

DISTRIBUTION OF PUBLIC SERVICES

RISK MITIGATION

By developing partnerships between companies, communities, municipalities and public entities at the regional level, this action would help job seekers to better understand the local job market. This action would represent an improvement in the distribution of public services and would contribute to creating better social equity.

OBJECTIVE

Leverage existing partnerships and identify new opportunities with stakeholders to create and expand meaningful employment and job training opportunities.

DESCRIPTION

Boosting employment opportunities for underserved communities can be achieved by establishing and increasing partnerships between companies, communities, municipalities and public entities at the regional level. The intent of this action is to create a regional cohesive working group of municipalities, local businesses and non-profit organizations whose mission is to:

- Identify the gaps between employment opportunities and demand in sectors ranging from trades to technologies
- Identify the initiatives that are already in place in the region that can be leveraged such as UMOS's workforce development program, LISC's leadership and training program and West Allis's Five Year Strategic Plan
- Establish partnerships between municipalities, businesses and non-profit organizations to help fill the gaps and boost employment at the local level

IMPLEMENTATION

1. Identify existing local initiatives/ partnerships
2. Establish intentional stakeholder partnerships and create a one-stop shop to fill gaps
3. Identify gaps that exist

PARTNERSHIP EXAMPLES: *School Districts, Businesses, UMOS, Meta House, Employ Milwaukee*

REFERENCE

West Allis, WI

The City of West Allis has identified this action in its City of West Allis Five Year Strategic Plan: 2017 –2021.

Action 2

Create A Regional Resilience Resource Center That Can Serve As A Space For Consolidated Community Resources

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

SOCIAL EQUITY

FUNDING SOURCE EXAMPLE

Municipal Planning/ Development Departments, Emergency Management Departments of Emergency Response Services.

RISK MITIGATION

Improve social equity by ensuring that every neighborhood has the ability to access information and assistance.

REFERENCE

West Allis, WI

West Allis plans to create the "City 101 Academy" to deepen resident and stakeholder knowledge regarding city services and budget/plans/priorities, and strategic goals and outcomes/ progress of city-wide plan alignment. The initiative could be used as a basis for the creation of a Regional Resilience Resource Center.

source: World National Bank Database

OBJECTIVE

Promote resilience at the local level and across the region by creating a resource center with consolidated information and services.

DESCRIPTION

A Regional Resilience Resource Center can increase residents' knowledge and participation in resilience at the local and regional level. Community resources include events that promote: health and human services (e.g., lead education), recreation and culture (e.g., park programs), and decisions about municipal projects (e.g., street repaving with additional pedestrian enhancements). The goal is to:

- Inform residents of how being proactive can improve resilience and how resilience benefits the community
- Present and promote local projects, initiatives and services around resilience
- Host workshops & classes with emergency services
- Organize community resource mapping initiatives to map neighborhood assets in order for the residents to better identify what the community assets are (social, infrastructure, emergency), the characteristics and places that make neighborhoods strong, and provide crucial support in times of emergency
- Enhance residents' participation and empower stakeholders in the decision-making processes to guide public investment. This can be done by ensuring meeting times and locations are offered for people working during the day (i.e., night meetings) and including meaningful opportunities for decision making about expenditures. Using non-traditional ways of engaging people such as webinars, electronic communication, training and surveys, should also become a standard

The Regional Resilience Resource Center could be accessed through the municipalities' websites and could be a shared resource by multiple municipalities.

IMPLEMENTATION

1. Create inventory of programs and events
2. Consolidate existing programs and events into a single space
3. Identify new needs and opportunities for information and services
4. Create community mapping plan
5. Advertise and promote events

PARTNERSHIP EXAMPLE: *Planning, Neighborhood Development, Communications, Emergency Departments*

LEADERSHIP: *Civic leagues, faith-based communities, non-profit organizations*

Action 3

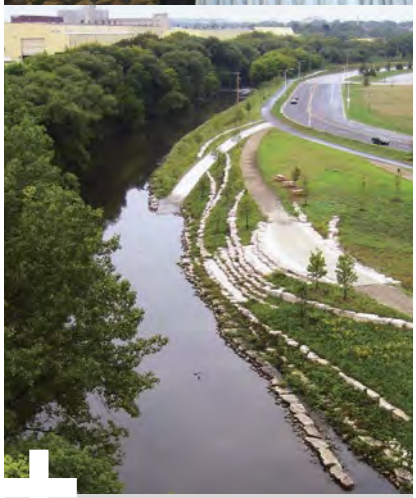
Engage Stakeholders In Collaborative Decision Making And Implementation Of Watershed Restoration & Water Quality Plans

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

CLIMATIC HAZARD

SOCIAL EQUITY



RISK MITIGATION

From a financial perspective, identifying recommendations that meet multiple goals (e.g., habitat and recreational) provides an opportunity for the development of cost-effective projects that address climate change and can reduce overall project costs.

OBJECTIVE

Engage stakeholders (both professional and public) in decision-making around the connections between land, water and people.

DESCRIPTION

Watershed restoration plans provide comprehensive recommendations for watershed health that address four interrelated areas: flooding, habitat conditions, water quality and recreational use. Engaging stakeholders (both professional and public) in decision-making in plan development allows for recommendations to move beyond decisions around land and water. Understanding how land and water projects can be designed to incorporate more benefits (i.e., extension of trails, park improvements, acceleration of other capital projects in the neighborhood) can improve the quality of life for residents within the watershed and provide an opportunity for multiple stakeholders to benefit from these long-term plans.

Public and private partners are working together to develop water quality improvement plans that will provide additional guidance to delist impaired water bodies and identify actions to improve the overall quality of water resources. The water quality improvement plans will incorporate and dovetail with existing and future watershed plans.

IMPLEMENTATION

1. Create engagement strategy and project milestones
2. Ensure stakeholders understand the problem
3. Present options and provide meaningful ways for decision making
4. Incorporate multi-faceted quality of life components

REFERENCE

SEWRPC Community Assistance Planning Report No. 316, A Restoration Plan for the Root River Watershed

Using existing plans and recent scientific data from established sources, planners at the Southeastern Wisconsin Regional Planning Commission, working with an advisory group of experts and interested parties, developed specific, targeted recommendations to improve water quality, recreational access and use, habitat conditions, and to reduce flooding in the Root River Watershed. These water quality recommendations include measures to reduce the levels of phosphorus, bacteria, and pollutants and can be found at www.sewrpc.org/SEWRPCFiles/Publications/CAPR/CAPR-316-root-river-executive-summary.pdf.

Action 4

Accelerate Local Efforts To Improve Communities By Replacing Grey Impervious Surfaces With Green Spaces

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

CLIMATIC HAZARD

SOCIAL EQUITY

DISTRIBUTION OF PUBLIC SERVICES

VULNERABILITY OF CRITICAL INFRASTRUCTURE

FUNDING SOURCE EXAMPLE

Municipal Planning/Development Departments, Emergency Management Departments of Emergency Response Services.

RISK MITIGATION

Removing impervious surfaces and replacing them with green (grass, trees, etc.) not only makes the spaces more attractive, but also creates spaces that contribute to lowering air temperatures during a heat wave, reduces stormwater runoff, and improves the neighborhood environment and air quality. This action addresses the climatic hazard and vulnerability of critical infrastructure while improving public services and social equity.

OBJECTIVE

Reduce stormwater runoff, energy costs, impacts of climate change, and the urban heat island effects.

DESCRIPTION

Depaving and removing grey impervious surfaces reduces stormwater runoff, allows for natural infiltration and creates public green spaces. This action aims to accelerate work that is being done by the municipalities and entities like MMSD to green the region's public spaces by continuing to push for green infrastructure to "manage rainwater where it falls" (MMSD Regional Green Infrastructure Plan) as well as increasing tree canopy in the public spaces (playgrounds, streets, sidewalks), with a focus on low-income neighborhoods. Tree City USA is an example of a program that supports municipalities in increasing tree canopy. Municipalities such as Milwaukee, Oak Creek and Wauwatosa are already part of that program, and their experience should be shared with the remaining Milwaukee region.

IMPLEMENTATION

1. Identify and prioritize publicly owned parcels with substantial impervious space
2. Increase funding that can support investments in green space and associated co-benefits
3. Identify and eliminate duplication of effort and waste
4. Implement projects that meet multiple triple bottom line objectives (i.e., social, environmental and economic)
5. Share best management practices with other partners

REFERENCE

depave

depave is a non-profit organization in Portland, Oregon that promotes the transformation of over-paved places to overcome the social and environmental impacts of pavement. They engage communities and reconnect urban landscapes to nature through action-oriented projects, education, advocacy and stewardship.

Action 5

Add Additional Healthy Food Programs So More Residents Have Access To Fresh, Locally-Sourced Foods

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

SOCIAL EQUITY

DISTRIBUTION OF PUBLIC SERVICES

FUNDING SOURCE EXAMPLE

Local Food Promotion Program (see Description).

RISK MITIGATION

Identifying clusters of negative health outcomes will help to target the evaluation of available food and food services. Focusing implementation of food programs and workshops in these areas as a start would directly impact social inequality by improving the health of residents through targeted services and programs.

OBJECTIVE

Expand programs to promote access to local and healthy food.

DESCRIPTION

Increasing access to healthy food can improve the health and well-being of the region's population. A healthy population is essential to the resilience of the region. With over 83% of Milwaukee Public Schools students enrolled in the Free and Reduced Lunch program, including schools in the Green and Healthy School Program, this would help to support access to healthy food. The Green and Healthy School Program addresses nine focus areas related to health, sustainability and the environment. Related to food, schools evaluate their effort to provide proper and balanced nutrition and couple that with curriculum related to food systems, physical health, and school policies. However, this model should be expanded beyond schools to address social inequality.

Increasing the quantity and accessibility of healthy food programs can be coupled with municipalities and public partners hosting workshops to teach residents how to prepare meals, use healthier food options and read nutrition labels. Programming around how to use SNAP benefits, particularly connecting residents to local farmers markets that accept SNAP should be part of workshops.

The Local Food Promotion Program (LFPP) offers grant funds with a 25% match to support the development and expansion of local and regional food business enterprises to increase domestic consumption of, and access to, locally and regionally produced agricultural products, and to develop new market opportunities for farm and ranch operations serving local markets.

IMPLEMENTATION

1. Identify target neighborhoods through GIS mapping
2. Create mobile market to send to priority areas
3. Replicate successful healthy food workshops
4. Create and implement promotional strategy for program awareness

REFERENCE

Sixteenth Street Community Health Centers: Healthy Choices Program

Through family education and community advocacy, the Healthy Choices Program strives to improve health outcomes through education. A 12-week bilingual family program provides nutrition education, healthy cooking strategies, physical activities that can be replicated at home, and stress management techniques.

Action 6

Improve Public Spaces, Community Health And Reduce Crime Through Environmental Design

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

SOCIAL EQUITY

VULNERABILITY OF CRITICAL INFRASTRUCTURE

FUNDING SOURCE EXAMPLE

City budget provided to the Mayor's Office of Criminal Justice (MOCJ) and asset forfeiture in the case of NYC.

RISK MITIGATION

To promote public safety in high-crime neighborhoods, CPTED principles could be developed for low- and no-cost changes to buildings, parks, and other features of an established environment that could reduce crime, improve social equity and decrease the vulnerability of critical infrastructure. Public spaces can be improved through investments in green infrastructure that reduce stress on the water infrastructure system and can integrate CPTED principles during design.

OBJECTIVE

Improve the quality of life for residents and reduce crime by altering the physical design of public and private spaces.

BUDGET EXAMPLE

Budget required: $51.5 M - (ratio: $6.3/inhabitant) for NYC
Cost savings: For every $1 invested = $1.33 in return

DESCRIPTION

The social determinants of health are conditions in the places where people live, work and play; oftentimes, they can have a greater impact on health outcomes than access to health care. Proper urban design of public spaces can ensure physical activity, positive activation of the space, integration of multi-modal transportation, and Crime Prevention Through Environmental Design (CPTED). CPTED is a multi-disciplinary approach to deterring criminal behavior by altering the physical design and encouraging legitimate use of public spaces. CPTED design components should take into consideration sight lines, lighting, landscaping and physical security. Integrating CPTED principles into planned retrofits or redevelopment can help build a sense of community and help neighbors gain control of their public spaces.

IMPLEMENTATION

1. Identify priority areas based on population, available space, and planned expenditures
2. Create comprehensive plans that take into account all aspects—the public should be engaged at all stages of planning
3. Create and implement a phased approach for public space redevelopment
4. Amend land use regulations, such as zoning ordinances, to incorporate CPTED principles

REFERENCE

30th Street Corridor flood relief project—Milwaukee, WI

*Concept rendering of project site (left)

Partners including MMSD, the City of Milwaukee, the Milwaukee Police Department, the Milwaukee Fire Department, the Milwaukee County District Attorney's Office, Safe and Sound, WHEDA, Wisconsin Department of Natural Resources, The Corridor, Clean Wisconsin, and Northwest Side Community Development Corporation have worked together to create a new green space in the heart of a neighborhood plagued with flooding. Although the primary function of this space is to hold 8.5 million gallons of stormwater, residents held an active seat at stakeholder and community meetings through the planning and design phases to ensure priority neighborhood aesthetic, recreational and safety concepts were incorporated into the project.

Action 7

Increase Access To And Understanding Of Existing Resources By Connecting Residents To Available Community Resources

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

DISTRIBUTION OF PUBLIC SERVICES

SOCIAL EQUITY

RISK MITIGATION

The purpose of this action is to improve communication with residents and provide simplified public access to the local government, thus contributing to better access to public services and improved social equity by providing all residents easy access to affect change in their neighborhoods and lives.

REFERENCE

Milwaukee, WI

In June of 2006, the City implemented (414) 286-CITY (2489), the single access telephone number for all City services and information. The purpose of (414) 286-CITY (2489) is to streamline public access to City government. The same suite of services are also available online in an easy to use portal.

OBJECTIVE

Increase awareness and use of community resources to improve the quality of life for vulnerable populations.

DESCRIPTION

Community resources exist to help address a variety of issues that residents may face. The problem is, some of the people that may benefit the most from these resources are unaware of their existence and/or do not use them. Increasing awareness of these resources will lead to increased use of the resources. In doing so, resilience is improved because awareness, access, and use of services decreases inequity.

Community resources including social services, municipal services and public safety are available to all residents. Because of a lack of awareness, the use of these services is not being maximized particularly by the people that could benefit the most from the services. Not knowing about these resources increases disparity and can negatively impact the quality of life for the most vulnerable populations (i.e. minorities, non-native English speakers, low-income, and elderly).

Community resources fall into the following three categories:

1. **Social services:** Provides connections to information and resources related to utility assistance, housing, food, elder care, crisis intervention, alcohol and drug recovery and more. This service is provided through Impact 2-1-1 and can be accessed by calling 2-1-1.
2. **Municipal services:** Provides connections to report and request more information related to public services such as trash/recycling, replacement of street lights, graffiti, and property nuisances. See reference below.
3. **Public safety:** Provides access to both emergency and non-emergency police. Often, residents are unaware that they can report crime anonymously. By opening communication with police, crimes can be logged more accurately which results in more accurate man power distribution.

IMPLEMENTATION

1. Identify resources offered for your community
2. Create communication platform to increase awareness
3. Promote use through integration with existing outreach efforts

Action 8

Expand The Existing Litter Pickup Programs And Change Behaviors Through Targeted Communication Campaigns

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

DISTRIBUTION OF PUBLIC SERVICES

SOCIAL EQUITY

FUNDING SOURCE EXAMPLE

- People could opt to donate a monthly fee on their water bill.
- Corporate sponsors.

Adopt-A-Beach

RISK MITIGATION

Awareness and communication campaigns should highlight creating a social norm for clean communities with a focus on individual behavior. It will enhance social equity and contribute to improved distribution of public services regarding waste removal. The goal is to beautify public spaces and build social cohesion.

OBJECTIVE

Empower and educate residents in order to reduce the amount of litter in public spaces and on the street and take pride in their community.

DESCRIPTION

Every April, Milwaukee Riverkeeper helps clean 55 locations across the Milwaukee River Basin and involves 4,000 volunteers. Developing and scaling up litter pickup programs in conjunction with a communications platform allows people to gain ownership of their spaces and participate in keeping their community clean and safe.

A strong contributor to littering is the presence of existing litter and lack of receptacle bins. Ensuring consistent and ongoing cleanup efforts at a neighborhood scale is crucial. As stated in the 'Broken Windows' theory, visible signs of decay in a neighborhood signal public disinterest and encourage crime. Keep America Beautiful suggests property values may decrease by 7% due to the presence of litter. In addition, getting individuals to physically touch litter by picking it up is proven to be an effective way of raising awareness about waste management that leads to behavior change: reduce, recycle, reuse, restore.

IMPLEMENTATION

1. Create Adopt-A-Street program
2. Contract out litter pickup with workforce development agency
3. Municipalities provide containers to households
4. Cigarette butt campaign to reduce litter

REFERENCE

Keep America Beautiful

Litter is costly to clean up, degrades our quality of life and economic development, and eventually ends up in our waterways and Lake Michigan. Changing behavior is key to preventing littering. The presence of litter and lack of receptacles encourages littering. The cost of litter abatement is substantial and is estimated at $11.5 billion annually for the U.S. Studies suggest that ongoing cleanup efforts are necessary at all scales (individual to municipal).

02

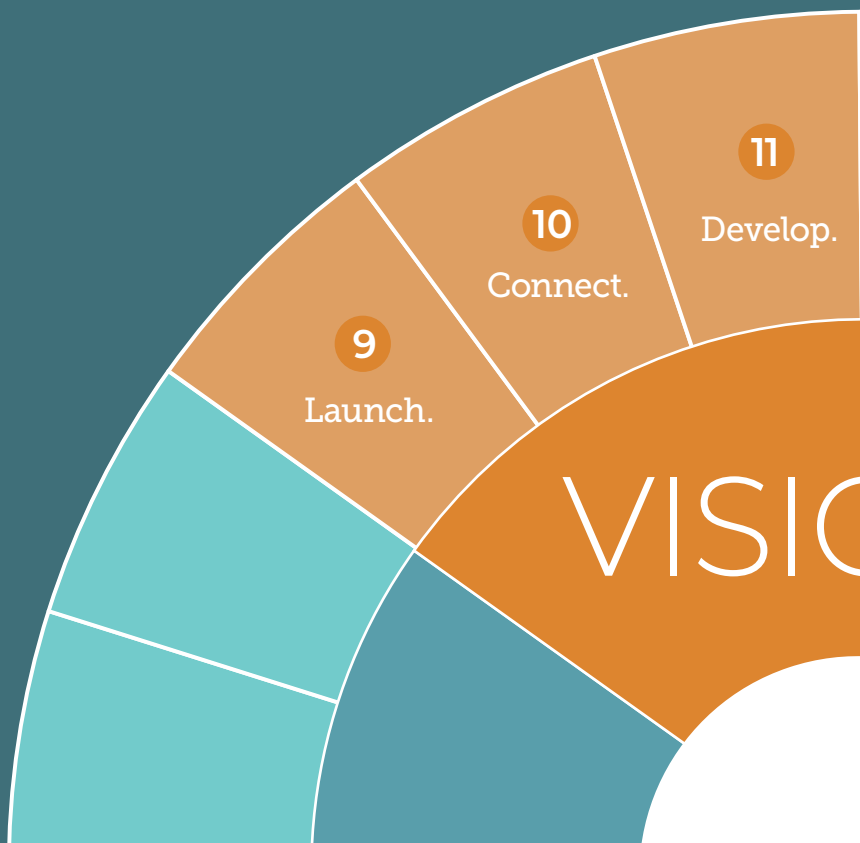
ACTION STRATEGIES

VISION 2

Boost the region's economic vitality through innovative job creation and access to equal opportunities

Action Pages

On the following pages each action includes a goal, an objective, risks addressed (identified by the icon in the upper left corner), as well as the status and suggested lead. The Plan is meant to be a guide, rather than a prescription and stakeholders will play varying roles in implementation.



Actions

Establish a direct link between regional innovation and job creation

9 Launch A Utilities Efficiency Program To Improve Low-Income Housing And Boost Employment

10 Create/Connect Job Training / Shadowing Program With The Schools And Major Employers In The Region

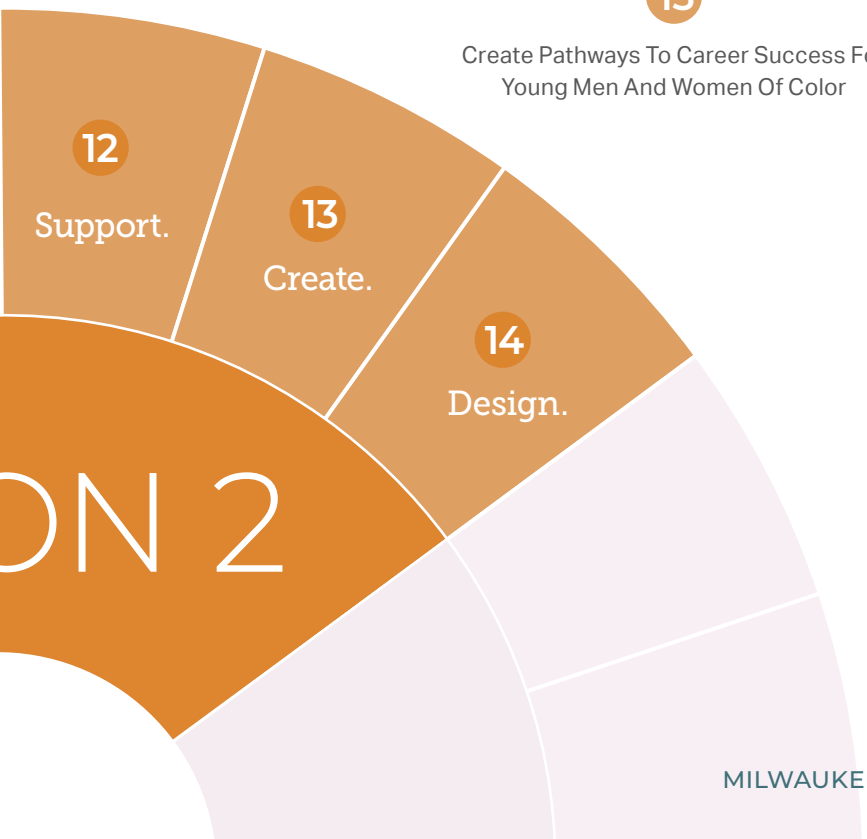
11 Develop Entrepreneurship Opportunities With Direct Links To Water And Energy Technologies That Meet Future Job Needs

12 Support The Creation Of And Training For Jobs Related To Sustainability In Specific Industries And Trades

Equal opportunity for all

13 Create Pathways To Career Success For Young Men And Women Of Color

14 Design A Suite Of Inclusive Business Development Services To Help Entrepreneurs Of Color Gain Equal Footing In The Milwaukee Region's Economy



Action 9

Launch A Utilities Efficiency Program To Improve Low-Income Housing And Boost Employment

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

ABILITY TO ADAPT TO JOB MARKET CHANGES

SOCIAL EQUITY

DISTRIBUTION OF PUBLIC SERVICES

RISK MITIGATION

Providing support to low-income populations with training programs would mitigate risks related to adaptation to job market changes, social equity and distribution of public services.

OBJECTIVE

Create workforce development opportunities and improve low-income housing by creating and expanding training programs for under- and unemployed residents.

DESCRIPTION

Efficient home energy and water systems save property owners and taxpayers money by reducing overall utilities consumption. Energy efficiency also reduces the use of traditional energy sources thus reducing climate-change-causing greenhouse gasses. Yet not everyone can afford to make the up-front investment in water or energy-saving systems.

This is especially true for low-income residents.

Improving the utilities efficiency of low-income housing can create new jobs in the water and energy fields such as plumbing, heating and cooling. Reduced energy consumption through efficiency programs improves local housing stock through the investment, reduces the use of fossil fuels and saves homeowners money.

This action aims to:

- Provide training and employment opportunities by implementing partnerships between municipalities and contractors
- Form a task force at the municipal level with newly trained workers to repair and improve damaged utilities systems for low-income households

Neighborhood Improvement Development Corporation
In partnership with the City of Milwaukee

Me² MILWAUKEE ENERGY EFFICIENCY
ecoCITY of MILWAUKEE

IMPLEMENTATION

Steps for implementation will be identified with partners.

REFERENCE

Reference: Existing Programs

This action is inspired by two programs already implemented in Milwaukee that could be replicated and / or scaled up:

- the Milwaukee Energy Efficiency (Me^2) program aimed at financing energy saving improvements
- the TIN (Targeted Investment Neighborhood) program designed to sustain and increase owner-occupancy

Action 10

Create/Connect Job Training/Shadowing Program With The Schools And Major Employers In The Region

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

ABILITY TO ADAPT TO JOB MARKET CHANGES

SOCIAL EQUITY

DISTRIBUTION OF PUBLIC SERVICES

MMSD Workforce Development

RISK MITIGATION

Increasing job opportunities for youth reduces social inequalities while helping the population to adapt to job market changes and improving the distribution of new public services.

OBJECTIVE

Identify opportunities to connect youth with companies to introduce them to a variety of jobs through hands-on job training and shadowing programs.

DESCRIPTION

According to the Education Commission of the States, business leaders in Wisconsin cannot find the science, technology, engineering and mathematics (STEM) talent they need to stay competitive.* At the same time, STEM jobs are expected to grow by 8% in the next 10 years whereas non-STEM jobs are expected to grow by 4%.* The industry projections developed by the Wisconsin Department of Workforce Development predict that demand in sectors such as education and health services and financial activities are expected to grow through 2024. Those numbers support the creation of job training / shadowing programs in partnership with the schools and major employers in the region to meet future job market needs.

Before creating a new program, programs that already exist should be identified as well as the gaps between those and the job market needs and the local businesses willing to participate in a job shadowing / training program. Partnership agreements between schools and local employers could be put in place to create a pipeline of students to training opportunities. These efforts can be scaled up by establishing partnerships with new businesses, providing additional training, and better connecting youth to these opportunities.

IMPLEMENTATION

1. Identify existing programs and gaps
2. Create partnerships with schools and employers
3. Promote to schools and students

REFERENCE

Milwaukee 7 Talent Partnership GROW HERE Campaign

GROW HERE brings industry and education together to help students discover careers. GROW HERE is a partnership that connects companies and career coaches with educators and students. GROW HERE is designed to dramatically increase career-based learning in the Milwaukee region and drive young people to careers in high-potential growth industries through career-based learning experiences.

***Partnership Examples:** School Districts, Businesses, UMOS, Meta House, Employ Milwaukee, Social Development Commission, LISC*

* http://vitalsigns.ecs.org/state/wisconsin/overview

Action 11

Develop Entrepreneurship Opportunities With Direct Links To Water And Energy Technologies That Meet Future Job Needs

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

ABILITY TO ADAPT TO JOB MARKET CHANGES

VULNERABILITY OF CRITICAL INFRASTRUCTURE

RISK MITIGATION

By creating an environment conducive to innovation, investment and job opportunities, this action aims to create long-term benefits that would reduce costs and increase efficiency of water and energy facilities .

OBJECTIVE

Support the emergence and reinforcement of entrepreneurship and innovation to adapt to market changes in the water and energy sectors.

DESCRIPTION

© The Milwaukee Water Council

The region continues to emerge as a major national actor in the water and energy sectors. The Water Council, the Global Water Center and the Midwest Energy Research Consortium (M-WERC) are initiatives that demonstrate the vitality of the region as a hub for the water and energy sectors. The intersection between water and energy sectors represents an opportunity for synergistic research programs and entrepreneurship initiatives.

This action seeks to identify the use of existing facilities, programs and resources such as the Global Water Center, the M-WERC, and the Milwaukee County Research Park in Wauwatosa. The goal is to identify and grow the region as an attractive national leader in the water and energy sectors.

IMPLEMENTATION

1. Identify the synergies between the water and energy sectors' stakeholders
2. Build a joint entrepreneurship program based on the identified needs
3. Accompany and mentor startups
4. Develop internship programs

LEADERSHIP: Water Council, M-WERC

PARTNERSHIP EXAMPLE: Milwaukee County Research Park, We-Energies, MMSD, Milwaukee Water Works, Universities, The Water Equipment and Policy Center

REFERENCE

Municipal Strategic Plans

This action is inspired by two strategic actions identified by the cities of Milwaukee and Wauwatosa:

- Grow Milwaukee's cluster of energy efficient and clean tech companies to create local jobs and exports (ReFresh Milwaukee Plan)
- Advance efforts to plan for and accommodate spin-off businesses generated by the Research Park and educational institutions (Wauwatosa)

Action 12

Support The Creation Of And Training For Jobs Related To Sustainability In Specific Industries And Trades

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

ABILITY TO ADAPT TO JOB MARKET CHANGES

SOCIAL EQUITY

RISK MITIGATION

Supporting the creation of and training for jobs related to sustainability requires an understanding of the barriers and an identification of the gaps between supply and demand.

The action would also benefit residents living in low-income neighborhoods by providing jobs.

OBJECTIVE

Promote, adjust and create jobs related to sustainability.

DESCRIPTION

The water, waste and energy sectors represent job opportunities that must be taken advantage of by the region.

In the water sector alone, between 130 and 150 water-related companies are located in the Milwaukee region, including five of the 11 largest water firms in the world. Therefore, training and preparing individuals for jobs related to sustainability makes sense now and for the future.

Through partnerships between public entities like MMSD and private companies, the goal is to provide job opportunities to train residents in needed workforce sectors, particularly those related to infrastructure.

Examples of jobs include wastewater treatment operator, sustainability analyst, electrical field technicians, production managers, solar panel technician, green HVAC/R technician, sustainable industrial designer and green construction manager.

IMPLEMENTATION

1. Partner with public agencies
2. Develop training and certification programs
3. Establish partnerships with private sector
4. Support creation and development of businesses that can supply workers
5. Develop policy that guides opportunities to impacted communities

REFERENCE

Green infrastructure jobs

- The Department of Environmental Protection (DEP) of New York City plans to hire 260 maintenance and horticultural workers to monitor and maintain the agency's growing number of bioswales (9,000) and other stormwater- management tools in public areas.
- The Northeast Ohio Regional Sewer District (NEORSD) in Cleveland will create 146 direct jobs to maintain green infrastructure, and indirectly create 73 jobs.

NEORSD employees
facebook.com/yoursewerdistrict/photos

Action 13

Create Pathways To Career Success For Young Men And Women Of Color

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Region
- Non-profit/ Business Partner
- MMSD

ABILITY TO ADAPT TO JOB MARKET CHANGES

SOCIAL EQUITY

FUNDING SOURCE EXAMPLE

Philanthropy, corporate sponsorships

RISK MITIGATION

This action supports social equity by increasing the number of people of color who are succeeding academically and socially in schools. An additional benefit is the ability to introduce individuals to new careers or vocational opportunities.

OBJECTIVE

Increase job opportunities for people of color to reduce social inequalities.

BUDGET EXAMPLE

Budget required: $25 M - (ratio: $60/inhabitant)
Cost savings: For every $1 invested = $2 in return

DESCRIPTION

The Milwaukee Public Schools District has already joined the My Brother's Keeper effort and will collaborate with families, other branches of government, local businesses and community organizations to increase the number of males of color who are succeeding academically and socially in schools. The goal is to improve long-term outcomes of men and boys of color.

This and other programs provide strategies to help ensure children enter kindergarten ready to learn, all students graduate from high school ready for college or a career, and that students have access to higher education or job training. The creation of pathways to career success for people of color should be scaled up all across the region through local programs like *Teens Grow Greens* and *Earn & Learn*.

IMPLEMENTATION

1. Create mentor program to connect students to volunteer mentors from local businesses, organizations and associations
2. Develop professional skills like goal setting, communication and time management
3. Provide career exploration in partnership with local universities

LEADERSHIP: Region

PARTNERSHIP EXAMPLE: Municipalities, school districts, local colleges and universities, local employers, Urban Strategies Council

REFERENCE

Reference: Oakland, CA

The City of Oakland is advancing the My Brother's Keeper Local Action Plan. As part of Oakland Promise, the city is going to launch Future Centers, which are college and career hubs on middle-school and high-school campuses.

They will provide support to these students to develop college and career plans. Future Centers will also help connect students with financial aid, scholarships, and internships.

The *"Classroom2Careers"* program will offer meaningful opportunities for youth to gain real-world internship experience.

Action 14

Design A Suite Of Inclusive Business Development Services To Help Entrepreneurs Of Color Gain Equal Footing In The Milwaukee Region's Economy

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Region
- Non-profit/ Business Partner
- MMSD

ABILITY TO ADAPT TO JOB MARKET CHANGES

SOCIAL EQUITY

OBJECTIVE

Create a diverse and thriving job base that supports communities of color.

BUDGET EXAMPLE

Budget required: $1 M /year (loan volume) in Oakland, California
Cost savings: $6 M at the end of year three for Oakland

DESCRIPTION

The region should expand and scale up the offering of programs, such as chambers of commerce, to benefit lower-income and minority entrepreneurs. These efforts should be integrated into an inclusive suite of services that help local businesses to expand, including referrals to service providers, location assistance, mentoring, and hiring assistance. Services should include training on business development plans, marketing, and mentorship. Minority-owned businesses oftentimes struggle to compete for contracts, meet bonding or other contractual requirements, and secure business loans. Numerous businesses are owned by people of color, but they generally have lower sales and fewer employees than white-owned businesses.

IMPLEMENTATION

1. Scale up existing disadvantaged business development programs (City of Milwaukee & MMSD already have programs)

REFERENCE

The African American Chamber of Commerce of Wisconsin seeks to help grow and support African American-owned businesses by providing access to capital, education and advocacy through capacity building and strategic partnership.

FUNDING SOURCE EXAMPLE

Philanthropy, savings from prioritizing and leveraging resources of chambers of commerce

RISK MITIGATION

Including loan programs and an online business portal would help small businesses start, then scale their operations and increase jobs, and might potentially reduce unemployment for low-income residents.

02

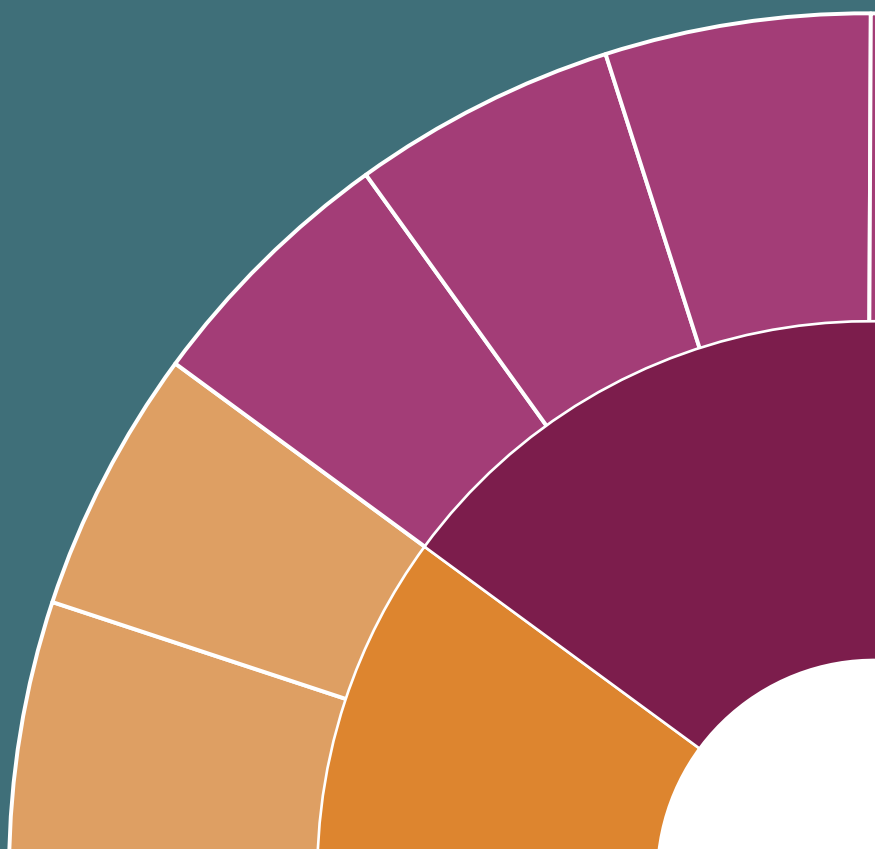
ACTION STRATEGIES

VISION 3

Adapt infrastructure to the challenges of the 21st century

Action Pages

On the following pages each action includes a goal, an objective, risks addressed (identified by the icon in the upper left corner), as well as the status and suggested lead. The Plan is meant to be a guide, rather than a prescription and stakeholders will play varying roles in implementation.



Actions

Prepare critical infrastructure for tomorrow

15 Develop And Implement Sustainable Practices Through Bids And Businesses Across The Region

16 Drive A Regional Energy Efficiency Program

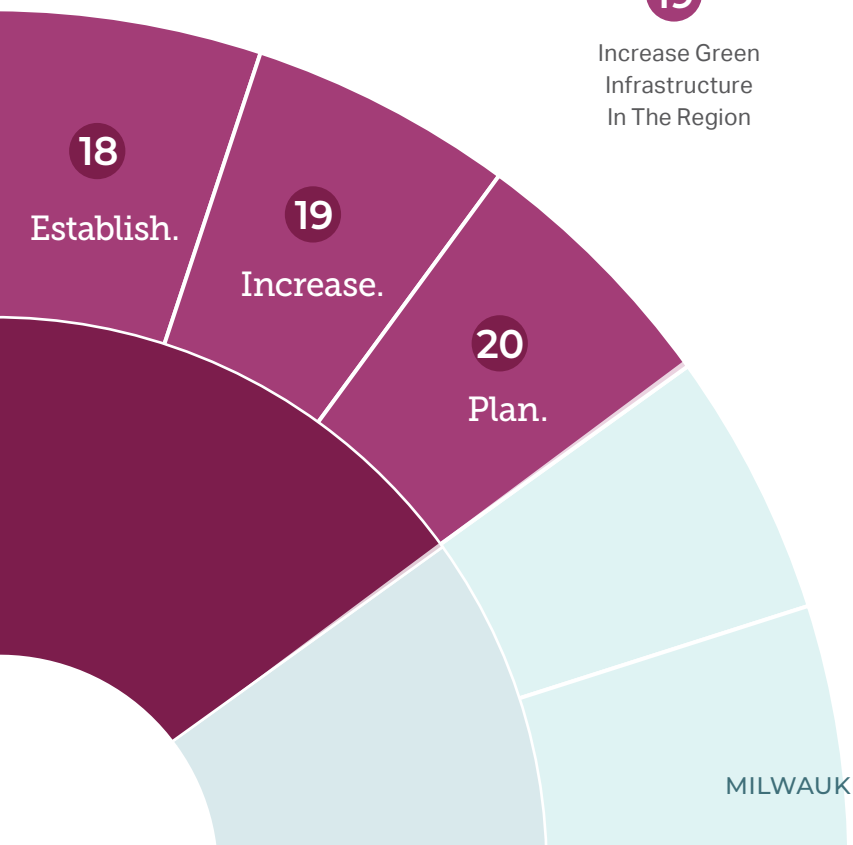
17 Assess The Reliability Of Critical Infrastructure By Performing A Criticality Analysis

18 Establish A Policy Review And Response Mechanism

Innovate to preserve water resources

19 Increase Green Infrastructure In The Region

20 Develop And Implement A Plan To Make Critical Infrastructure Around Water Systems Cyber Resistant



Action 15

Develop and Implement Sustainable Practices Through Bids And Businesses Across The Region

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

ABILITY TO ADAPT TO JOB MARKET CHANGES

VULNERABILITY OF CRITICAL INFRASTRUCTURE

RISK MITIGATION

To reduce the vulnerability of critical infrastructure, communities and private companies must do the best they can with existing technologies and seek to apply emerging technologies, designing and delivering the most resource- and energy-conserving infrastructure within the limits of budgets and priorities. This could result in the development of a framework conducive to sustainable development and the creation of new jobs related to sustainability.

OBJECTIVE

Integrate energy, waste, and sustainable material components into RFPs and/or bids.

DESCRIPTION

Buildings and attendant infrastructure are responsible for the largest component of global energy and water use, as well as related sewage and organic waste production.

Due to continuing urbanization, global-level strategies need to be developed that facilitate both the sustainable construction of new cities and the redevelopment of existing urban environments. A response to this need is the integration of environmentally sound infrastructure systems for integrated resource management. Incorporation of the Envision sustainable infrastructure rating system into projects, RFPs and bids should be considered as a consistent tool to integrate sustainable practices.

New civil infrastructure will establish energy, water and materials efficiencies as well as result in ecosystem benefits for the next few decades. Integrated resource management is useful to develop and implement sustainable practices such as:

- Adopting green construction codes for commercial buildings
- Improving the physical condition of deteriorating cities, including residential and commercial buildings
- Encouraging green building practices for redevelopment of sites in the region
- Integrating energy, waste, and sustainable material components into RFPs and/or bids (Envision)

IMPLEMENTATION

Steps for implementation will be identified with partners.

REFERENCE

Municipal Strategic Plans

This action is inspired by three strategic actions identified by the City of Milwaukee and Village of Fox Point:

- Implement sustainable building practices and standards for development and major redevelopment *(ReFresh Milwaukee Plan)*
- Improve the physical condition of deteriorating and blighted city, residential, and commercial buildings *(ReFresh Milwaukee Plan)*
- Encourage green building practices for redevelopment of sites in the Village including practices that promote energy conservation, stormwater management, and improved air quality *(Fox Point)*

Action 16

Drive A Regional Energy Efficiency Program

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Region
- Non-profit/ Business Partner
- MMSD

VULNERABILITY OF CRITICAL INFRASTRUCTURE

RISK MITIGATION

Energy efficiency can support community resilience by strengthening local energy systems and delivering more-reliable and affordable energy for local governments, households, and businesses.

OBJECTIVE

Improve energy efficiency and energy savings across the region.

DESCRIPTION

The region has enormous potential to benefit from the greater use of renewable energy and energy efficiency measures.

The cost of importing coal is a drain on the region's economy, which relies on gas and coal-fired power. Investments in energy efficiency and homegrown renewable energy can help stimulate the economy by redirecting funds into local economic development that would otherwise leave the region.

The Midwest Energy Efficiency Alliance (MEEA) is a collaborative network advancing energy efficiency in the Midwest for sustainable economic development and environmental stewardship. Regional partners can work with MEEA to integrate new technologies, products and best practices. Additionally, MEEA can assist the region on policy, training and education, and building energy codes. The Environmental Protection Agency offers programs that assist local governments in working with utilities to design efficiency programs for homes and businesses, and to improve the efficiency of facilities.

IMPLEMENTATION

Steps for implementation will be identified with partners.

REFERENCE

Municipal Strategic Plans

Here are some actions included in ReFresh Milwaukee Plan:

- Improve residential and commercial energy efficiency in Milwaukee
- Replace fossil fuel energy use with more clean renewable energy in City of Milwaukee facilities

Action 17

Assess The Reliability Of Critical Infrastructure By Performing A Criticality Analysis

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

FINANCIAL CONSTRAINTS

CLIMATIC HAZARD

VULNERABILITY OF CRITICAL INFRASTRUCTURE

RISK MITIGATION

This action anticipates risks related to critical infrastructure by diagnosing the vulnerabilities. Knowing these vulnerabilities improves the ability to anticipate reconstruction, develop multi-partner solutions to mitigate the risk, adapt regulations and mobilize adequate financing.

OBJECTIVE

Measure, understand and monitor the state of infrastructure.

DESCRIPTION

Critical infrastructure (e.g., wastewater, drinking water, energy and communications) is the keystone of urban life. As urban populations increase and the climate continues to change, infrastructure becomes more stressed and is unable to adapt.

Climate impacts are projected to lead to increases in investment required for infrastructure, and the use of tools for decision-making under these uncertain circumstances can reduce the need for costly retrofitting and potential up-front costs. There is reduced reliability from deteriorating infrastructure and the lack of adequate funding and support to invest in infrastructure.

Addressing these challenges involves anticipating risks related to critical infrastructure and developing multi-partner solutions to mitigate them. Although risks can be addressed on an individual project basis, to increase resilience a strategic approach to infrastructure network planning should be created.

An audit can be completed to get a comprehensive understanding of infrastructure investment needs and would include the level of vulnerability to climate hazards (e.g., increased precipitation). That information would be integrated into a spatial mapping application to better coordinate major infrastructure improvements to reduce costs and disruptions to the public. This would require development of a common platform to identify infrastructure needs that can be shared among stakeholders and coordination meetings to collaborate on planning improvements.

IMPLEMENTATION

Utilize MMSD-developed dashboards as a template to allow municipalities to assess and visualize sewer infrastructure investment needs.

1. Leverage tool developed by regional agency for municipal benefits
2. Provide understanding of regional investment needs for sewer infrastructure
3. Pilot first step in developing a regional approach to manage infrastructure needs

Action 18

Establish A Policy Review And Response Mechanism

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

CLIMATIC HAZARD

VULNERABILITY OF CRITICAL INFRASTRUCTURE

RISK MITIGATION

Municipalities could decide on a set of criteria that would trigger a review of ordinances.

Those criteria could be as simple as a review that happens every five to 10 years, or the criteria could include consideration of changing environmental conditions such as changing Lake Michigan levels or a specified threshold of rainfall. When these criteria are met, the municipalities would have the opportunity to review their policies or to put in place early responses in order to reduce the impact of identified risks on communities.

OBJECTIVE

Allow communities and organizations to be flexible and respond to changes in policy needs, to adapt to changing social, environmental and economic conditions.

DESCRIPTION

Resilient communities are communities that can adapt to changing conditions. No single approach to adapting to changing conditions is appropriate for all communities. Each municipality and the region has to contend with unique geographic and specific climatic hazard issues.

Creating a mechanism that allows communities to review their rules, plans, procedures and regulations in the light of changing conditions can place stakeholders in an adaptive position to ever-changing urban circumstances. Adaptive management identifies uncertainties and then establishes methodologies to test hypotheses concerning those uncertainties. It uses management as a tool not only to change the system, but as a tool to learn about the system.

IMPLEMENTATION

Steps for implementation will be identified with partners.

REFERENCE

Milwaukee region

This action is inspired by the collaborative strategy developed in "Integrated Assessment on Water Level Variability and Coastal Bluffs and Shores, Northern Milwaukee County and Southern Ozaukee, Wisconsin."

Action 19

Increase Green Infrastructure In The Region

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Region
- Non-profit/ Business Partner
- MMSD

CLIMATIC HAZARD

VULNERABILITY OF CRITICAL INFRASTRUCTURE

FUNDING SOURCE EXAMPLE

Stormwater fees

RISK MITIGATION

GI would reduce the vulnerability to climate hazards by reducing stormwater runoff and the amount of water entering the combined sewer system. It also increases groundwater recharge and may capture and store carbon.

REFERENCE

Coakley Brother's

Coakley Brothers's new stormwater landscape courtyard uses a variety of green infrastructure strategies to manage runoff on site. The highlight of this project is the underground storage system that collects the water from the parking lot and walkways. The smart drain technology employed on site allows this system to temporarily detain and release stored water so it does not overwhelm the local sewer system. This project can manage over 207,000 gallons in any given storm!

OBJECTIVE

Reduce the vulnerability of sewerage infrastructure while providing social, economic and environmental benefits.

DESCRIPTION

Green Infrastructure (GI) complements the grey infrastructure system by reducing inflow and retaining the water on the surface. Grey infrastructure is extremely costly to replace or retrofit in response to changes in rainfall and flow. GI is an adaptive and responsive strategy that can be implemented on various levels and at all scales.

The MMSD Regional Green Infrastructure Plan recommends adding 740 million gallons of GI capacity across the region to reduce the risk of basement backups and sewer overflows by the year 2035. GI practices need to be properly installed, operated and maintained to help the region achieve the 740 million gallon goal and Wisconsin Department of Natural Resources (DNR) permit requirements.

GI practices, such as rain gardens, green roofs, bioswales, rainwater catchment and porous pavement, have unique operation and maintenance needs compared to traditional grey stormwater management approaches and also have many co-benefits for communities:

- Capture and long-term storage of carbon
- Enhances biodiversity
- Reduces stormwater runoff during more frequent events
- Increases groundwater recharge
- Improves community livability
- Cultivates public education opportunities

On a broader scale, the Fresh Coast Resource Center is an ambitious resource center with a goal of increasing GI implementation by providing resources and support to stakeholders. www.freshcoastguardians.com

IMPLEMENTATION

1. Communicate stormwater runoff issues and discuss the solutions
2. Engage the public and co-design the solution
3. Involve the public in implementation
4. Raise awareness around new neighborhood features
5. Identify best practices for green infrastructure, including funding sources, and substantially scale up implementation

Action 20

Develop And Implement A Plan To Make Critical Infrastructure Around Water Systems Cyber Resistant

STATUS
- New Action
- To Be Scaled Up
- Ongoing

LEAD
- Municipalities
- Non-profit/ Business Partner
- MMSD

FINANCIAL CONSTRAINTS

CLIMATIC HAZARD

VULNERABILITY OF CRITICAL INFRASTRUCTURE

RISK MITIGATION

The study and assessment would lead to the identification of the level of risk for critical infrastructure components and the development of an action plan to counter the 'cyber hazard' for critical infrastructure.

OBJECTIVE

Increase the cyber resilience of water systems to reduce vulnerability.

DESCRIPTION

While increasing automation of the region's water systems, it is important to consider the cyber risks of Information and Communications Technology (ICT) systems as well as cascading impacts if there is a technology malfunction. Climate resilience and critical infrastructure are closely related; some learning from this action will be used to support other actions related to critical infrastructure asset management.

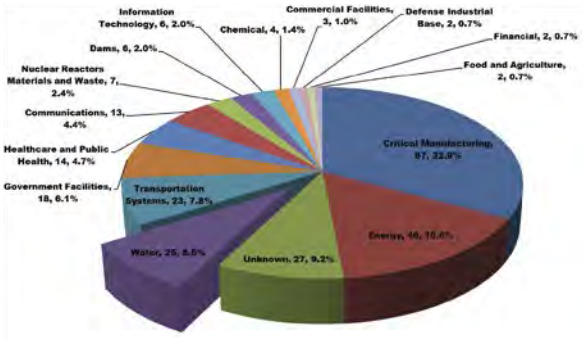
Climate change with increasing digitalization and automation of the systems will test this, and will likely expose more cascading impacts and vulnerabilities, specifically to ICT disruptions. The study to be carried out from the resilience perspective considers ICT, security and emergency response. Operational specialists and policy–oriented professionals from both municipal and water authorities should be included.

A quick scan of risks for critical functions of the water systems can highlight a greater need for tactical awareness regarding the cyber risks of Industrial Control Systems. A deeper assessment, identification of level of risk and development of an action plan can respond to this risk. What components of critical infrastructure are currently at risk would need to be identified and compared with existing plans.

IMPLEMENTATION

Steps for implementation will be identified with partners.

REFERENCE



London and Singapore

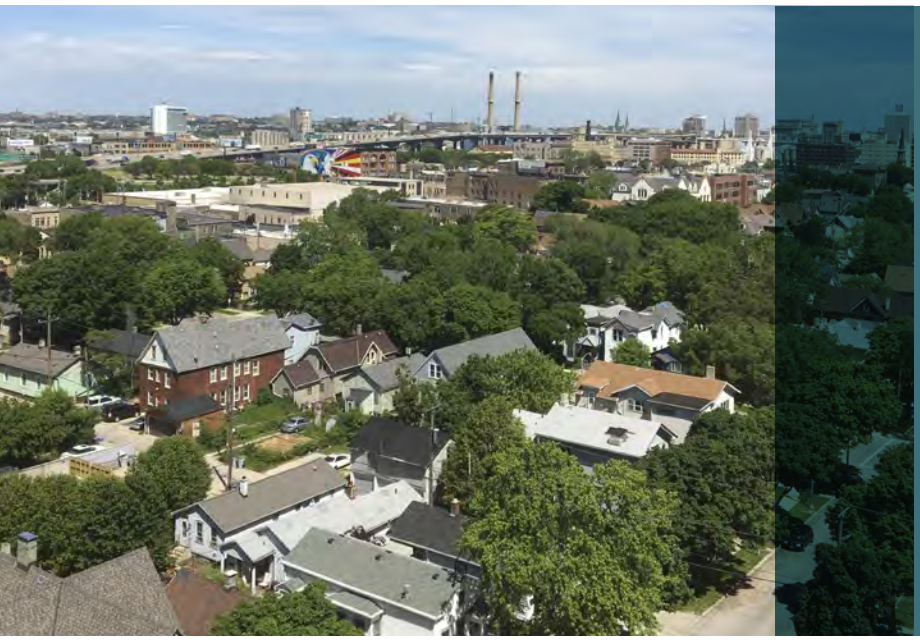
London and Singapore have identified the same challenges related to cyber threats. Partnerships with private companies were built to protect key infrastructure related to cyber risks, especially on water management system.

Part 3

02

IMPLEMENTING RESILIENCE

In developing the Resilience Plan, numerous municipalities, organizations, and stakeholders helped identify the region's most pressing risks. These risks continue to be exacerbated by changing populations, economic challenges and climate change. This Plan presents a comprehensive vision for the actions that can help move the needle to reduce those risks, improve our neighborhoods, and more strategically address climate change. Based on other resilience plan efforts, it is clear that addressing these big and complicated risks will need participation and implementation at all scales and from all sectors.



As projects are identified, key performance indicators should be created to demonstrate how effectively the project is addressing the action it is related to. The indicator should include a baseline, a target/goal, and a timeframe for when the target should be met. Because projects are likely to vary substantially, evaluating the impacts of the Plan is particularly challenging.

A STRONGER MORE RESILIENT REGION CAN ONLY BE ACHIEVED IF WE WORK TOGETHER.

The recommended actions can be implemented individually or integrated into projects. They are intended to be a menu of options for how to create stronger, more meaningful projects in the face of strained budgets. A stronger more resilient region can only be achieved if we work together. This strategy represents a starting point for a path forward, but the real work will come from the conversations, policies and projects that take place into the future. Our communities can become stronger, they can become resilient, and the risks can be reduced—but only if we all work towards the same goal.

The following are suggested categories that key performance indicators could address.

Cost Avoidance

This relates to the "return on investment" of a project by comparing the capital expenditures invested in the project with the costs incurred if a risk materializes and nothing is done.

Environment

This relates to evaluating the actions by measuring indicators that track impacts on natural systems such as land, air and water.

Quality of Life

This relates to the improvement of specific social-based indicators such as housing, income, jobs, education, engagement, health, and life satisfaction.

Population

This relates to the number of people, or a subsection of the population that benefit from a particular action or project.

PARTNERSHIPS

This process and our future resilience would not have been possible without participation of the following experts and leaders. Thank you for your time and commitment to strengthen our communities.

Commissioner John Hermes

Commissioner Kris Martinsek

Islamic Society of Milwaukee

Ossie Kendrix (African American Chamber of Commerce)

Mayor Dan Devine (City of West Allis)

Mayor Kathleen Ehley (City of Wauwatosa)

Mayor Tom Barrett (City of Milwaukee)

Steve Fronck (City of Milwaukee-Director of Office of Emergency Management & Homeland Security)

Paulina De Haan (City of Milwaukee- Office of Emergency Management & Homeland Security)

Ghassan Korban (City of Milwaukee-Department of Public Works)

Tim Thur (City of Milwaukee-Department of Public Works)

Nader Jaber (City of Milwaukee-Department of Public Works)

Michael Shaefer (Milwaukee Water Works)

Erick Shambarger (City of Milwaukee-Environmental Collaboration Office)

Former Village President Carl Krueger (Village of Brown Deer)

Village Manager Michael Hall (Village of Brown Deer)

Nate Piotrowski (Village of Brown Deer)

Village President Douglas Frazer (Village of Fox Point)

Scott Brandmeier (Village of Fox Point)

Scott Botcher (Village of Fox Point)

City Administrator Rachel Reiss (City of Glendale)

Village President Robert Ruesch (Village of Hales Corners)

Sandra Kulik (Village of Hales Corners)

Village Manager Andy Pederson (Village of Bayside)

Village Manager Paul Boening (Village of Whitefish Bay)

Mayor Dan Bukiewicz (City of Oak Creek)

Susan Winnen (City of Oak Creek)

Rachel Wald (Village of Shorewood)

Mayor John Hohenfeldt (City of Cudahy)

Mary Jo Lange (City of Cudahy)

Melinda Dejewski (City of St. Francis)

Mayor CoryAnn St. Marie-Carls (City of St. Francis)

Bryan Holmstrom (Southside Organizing Center)

Kristen Hogan (Village of New Berlin)

Kelly Strasuberger (Village of New Berlin)

Village Manager (Elm Grove) Dave DeAngelis (Representing non-member communities: Brookfield, Butler, Caledonia, Elm Grove, Germantown, Menomonee, Mequon, Muskego, New Berlin, Thiensville)

Diane Wagner (Miller-Coors)

Leah Redding (Milwaukee County)
Adam Bechle (Wisconsin Coastal Management Program)
Benjamin Juarez (Wisconsin Policy Forum)
Gordie Bennett (Milwaukee County)
Christopher Gluesing (Marquette University)
John Willis Gardner (University Wisconsin-Milwaukee)
Kate Nelson (University Wisconsin-Milwaukee)
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COMMUNITY COMMENTS

I am hopeful that the Resiliency Plan becomes more than a plan - a plan is no good until it is implemented and put in action.

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THANK YOU

The Resilience Plan provides general recommendations for how to address risks that are impacting 28 communities in southeastern Wisconsin. Risks and recommendations were decided on collectively by stakeholders. The recommendations can be implemented individually or integrated into projects. The recommendations are flexible and can be applied at various scales depending on the need and the budget.

17-021

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Attachment 7-3

Building a More Resilient New Orleans through Physical and Financial Protection

Report by

Veolia and Swiss Re

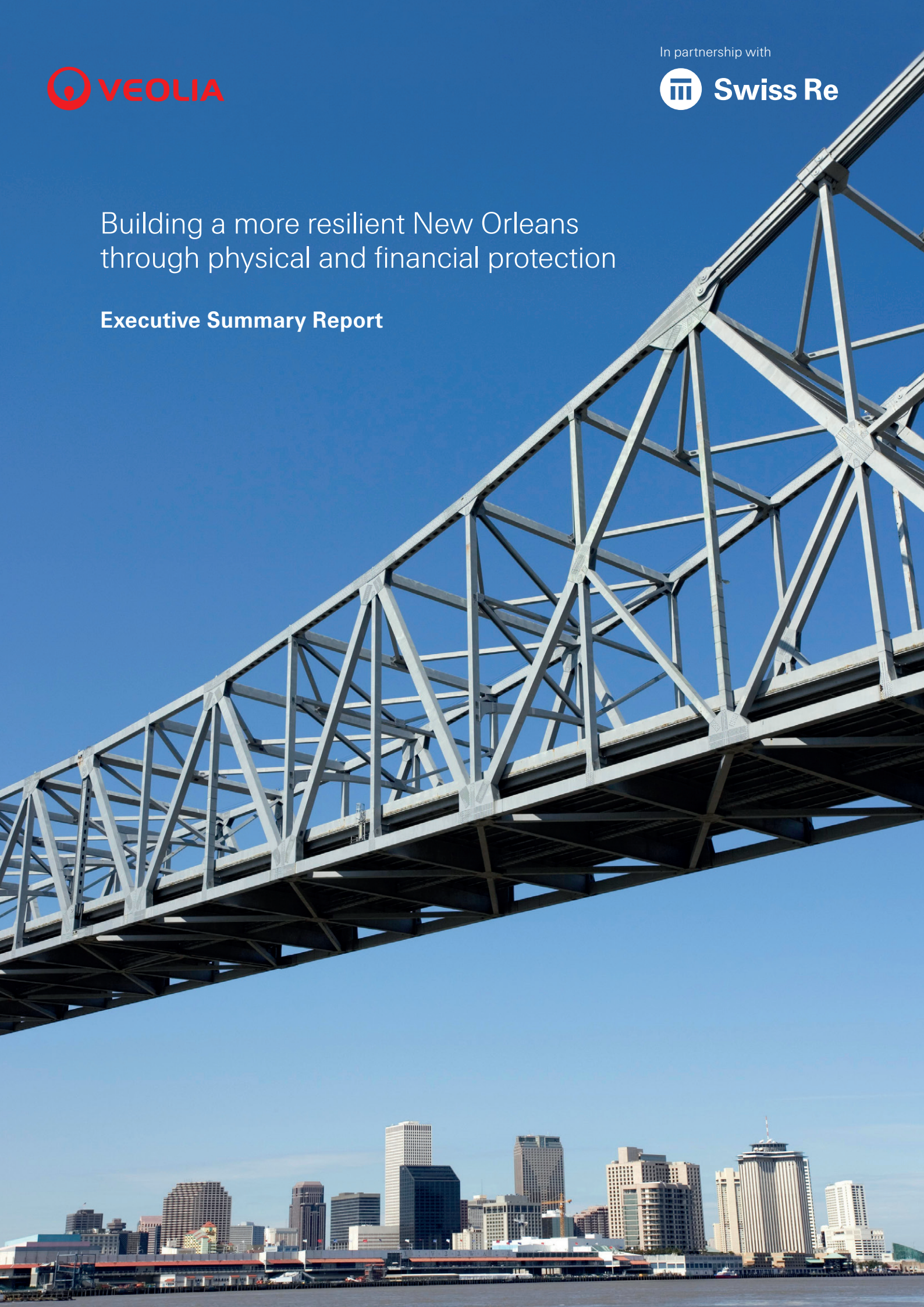
VEOLIA

In partnership with

Swiss Re

Building a more resilient New Orleans through physical and financial protection

Executive Summary Report



Dear Sirs

Resilient New Orleans – Executive summary report

In accordance with the terms of Amendment No. 1 to the Professional Services Agreement (the "Amendment") between Sewerage and Water Board of New Orleans (the "Board") and Veolia Water North America-South LLC ("Veolia"), Veolia and Swiss Re, as subcontractor to Veolia under the Amendment, enclose our executive summary report (the "Report") in connection with the risk evaluation of the Board's potable water, sewerage, drainage, and self-generated power infrastructure. The Report will be supplemented by a technical report (the "Technical Report") describing, inter alia, the methods used to assess the Board's assets exposure. The Report and, in particular, the figures contained in Section 5.2 should be read in conjunction with the Technical Report.

The scope of our work, as determined by the Board, is detailed in the Disclaimer on page 6 of the Report. You should note that our findings do not constitute recommendations to you as to whether or not you should proceed with certain capital expenditures. The Disclaimer should be read in conjunction with this letter and the Report.

Our Report is for the benefit and information only of the Board and should not be disclosed, in whole or in part, without our prior consent, except as specifically permitted in the Amendment. To the fullest extent permitted by law, we will not accept responsibility or liability to any other party in respect of our work in the Report.

Yours faithfully

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Disclaimer – Scope of Work

- This Executive Summary Report (the Report) or any information submitted in connection therewith does not serve to modify, revise, change, negate or otherwise amend any provisions of Amendment No. 1 to the Professional Services Agreement. The content of the Report is necessarily limited by the information that has been available and reviewed to date, portions of which may still be subject to verification.
- Our work commenced on 23 June 2016 and our fieldwork was completed on 18 October 2016. We have not undertaken to update our Report for events or circumstances arising after such completion date.
- In preparing the Report, our primary source of information has been the management of the Sewerage and Water Board of New Orleans ("SWB"). We do not accept responsibility for such information which remains the responsibility of SWB. Details of our principal information sources are presented in the Report and we have satisfied ourselves, so far as possible, that the information presented in our Report was consistent with other information which was made available to us in the course of our work in accordance with the terms of Amendment No. 1 to the Professional Services Agreement. We have not, however, sought to establish the reliability of the sources by reference to other evidence.
- When referring to our "analysis", this indicates only that we have (where specified) undertaken certain analytical procedures on the underlying data to arrive at the information presented; we do not accept responsibility for the underlying data.
- The information used for the analysis was provided and validated during the course of the meetings with SWB management.
- Veolia Water North America-South LLC and its affiliates under no circumstances warrant the accuracy or completeness of the information given in the Report. All liability for the accuracy and completeness thereof or for any damage or loss resulting from the use of the information contained in this Report is expressly excluded. Under no circumstances shall Veolia Water North America-South LLC or its affiliates be liable for any financial or consequential loss relating to the use of this Report.
- Land subsidence was not taken into account for the analysis: considering that some studies show subsidence ranging from 0 to 1 inch per year, it is important to note that subsidence should be determined for each asset before engaging in capital expenditure and monitored over time to ensure mitigation measures are still effective.
- Levees and other protection measures implemented post Katrina by the US Army Corp of Engineers were not analysed or tested and were considered appropriate for the purpose of the Swiss Re modelling of potential events. Following Katrina, the US Army Corp of Engineers undertook studies to determine the appropriate levels needed for the levees and built them in light of their analysis and modelling. The scope of our work did not include an analysis of the works performed by the US Army Corp of Engineers. Moreover, the Swiss Re model assumes that the structures put in place would respond effectively to the weather events up to 100 - year return period.
- The scope of our works did not include the review of any of the flood protection measures in place outside of the assets under the control of SWB at the time of the analysis (e.g. canals, levees, storm surge walls).
- The scope of our works did not include any assessment or audit of the compliance of systems, processes, or operations in accordance with regulation or standards. In particular, water quality and compliance with standards were not in the scope of the analysis and therefore not tested.
- The analysis performed focussed on the critical assets of SWB's portfolio determined by its management.
- Our review did not include a valuation of the assets of the SWB portfolio. These values were provided by SWB's management.
- The mitigation costs are estimates and may be subject to change.

1 New Orleans: A highly protected city

Hurricane Katrina changed New Orleans substantially. This cultural gem of the United States will never be the same, but it retained its best attributes and improved irreversibly upon its weaknesses. This tragic event produced horrible loss of both life and property, yet it provided a tremendous opportunity to the City to lead the world in re-defining recovery and thoughtful development in the face of inevitable risk. Since Hurricane Katrina, billions of dollars have been deployed to increase the resilience to future events. In many respects, New Orleans has become the incubator of resilience building globally. As such, New Orleans is a highly protected city. This includes the assets of the Sewerage and Water Board of New Orleans (SWB), which provides critical drainage, wastewater and fresh water services to the city.

Over USD 14 billion has been spent to enhance or expand the levees in and around New Orleans since Hurricane Katrina. The investments into flood protection to date mean there have been significant savings from avoided losses to all physical assets across Orleans Parish. According to a sensitivity analysis with Swiss Re's tropical cyclone model, the flood protections in place today are saving Orleans Parish USD 650-750 million of property damage per year from storm surge on an annualized basis. These savings are significant, but should not distract from the fact that there is still considerable residual flood risk. Even with the investments made, the annual expected loss from hurricane-related storm surge is an estimated USD 175–275 million of property damage.

Prior to the levee failures due to storm surge erosion of the landward sides of the levee during Hurricane Katrina, there was no significant flooding at any of the SWB facilities. General consensus by SWB employees interviewed is that had the levees not failed, Hurricane Katrina would have had only minimal impact on the SWB assets and New Orleans' residents. Once the levees failed (approximately 3 days after Hurricane Katrina's landfall along the Gulf Coast) the drainage pump stations were shut down to keep from simply recycling the same water to Lake Pontchartrain and back. At the same time, the power plant at the Carrollton Water Treatment Plant was shut down due to water flooding the basement and threatening to compromise the existing electrical equipment. This equipment has since been moved upward to the first and second floors. According to SWB staff, the storm drainage pump stations were able to de-water New Orleans 8 to 14 days following repairs to the levee.

The proper functioning of the levee system is the single most important factor in reducing losses. The drainage capacity of SWB pumps is critical to keep flooding from rainfall and overtopping to a minimum. At 50% SWB pumping capacity, based on US Army Corp of Engineers (USACE) 500-year flood depth maps, Swiss Re estimates that property damage in Orleans Parish could be below USD 4 billion, provided the flood walls do not fail.

Notwithstanding the significant loss reduction created by this system, it is important to note that system failure would lead to devastating flooding and would have significant impacts on both the physical assets and economy of New Orleans, including the SWB. To prepare for this possibility, albeit remote, it is imperative that SWB assets continue to function or come back online swiftly to reduce the City's effective disruption and downtime, even in the event of a severely disruptive flood.

2 The value of the SWB to the economic productivity and resilience of Orleans Parish

The SWB provides fresh water, wastewater treatment and water drainage, among other services, for the entire Orleans Parish. Like any living organism, a city thrives on the collaborative and efficient functioning of interconnected systems. Each system and the service it provides are critical. Moreover, the interconnected function of these systems make them indispensable to the liveability of a city. Shocks, such as natural disasters, can damage critical physical assets, as well as interrupt the delivery of these services to residents and businesses, creating often profound long-term economic impacts. Every sector of an economy can face a variety of consequences from disruptive events, such as hurricanes – some more than others. Economies heavily dependent on tourism, hospitality or the movement of goods can suffer more deeply as revenues from these sectors are often diverted elsewhere and are rarely recovered. While the physical assets of various sectors of an economy may be left unscathed by a disaster, their ability to operate diminishes if critical infrastructure is impaired. Hence, any considerable disruption of these services can have sizeable and lasting impacts on a local economy. Reducing the possible downtime of critical assets is necessary to enhance the City's resilience.

Hurricane Katrina, which flooded nearly 80% of New Orleans, had considerable repercussions for the City's population, economy and public finances. While the majority of business activity came to a complete standstill after Hurricane Katrina made landfall, the ability of businesses to reopen, and the City's sales tax revenues to rebound, were strongly correlated to the availability of critical services. Drainage pump stations began to work one week after the event and drinking water returned fully only after eleven weeks.

It is estimated that tourism in Orleans Parish generates an average of USD 250 million per year in direct tax revenue for the city, making it the single largest industry revenue producer. However, as a result of events like Hurricane Katrina, revenues that would have otherwise been generated, drop precipitously. This can be the result of cancelled conventions, shuttered restaurants, hotels, or stores. Additionally, the longer term impact of lost tax revenue, via reduced property values, can have an impact on the City's ability to operate and plan strategically.

Orleans Parish lost USD 325 million in tax and other revenues[1] between 2005 and 2006 due to the lasting effects of Katrina; the SWB sustained USD 117 million in damage. From a different perspective, for every USD 100 of property damage, Orleans Parish lost USD 0.61 in tax revenue.

In the 130 days after Katrina, the city lost on average USD 25.3 million per day in GDP (USD 760 million per month). This is derived from the assumption that business activity produces about half of the GDP[2] and Katrina forced 80% of the businesses to shut down. Today, one month of hurricane-related downtime would reduce the City's economic output by roughly the same amount (based on an estimated Orleans Parish annual GDP of USD 23.5 billion).

3 Defining the resilience dividend

Substantial economic value and productivity are susceptible to the impacts of various SWB service disruptions. This analysis, therefore, aims to determine the potential improvements that can be made to those SWB assets providing the greatest resilience dividend in terms of reducing losses against capital investment in current and future climate scenarios. Exploring the cost of various risk reduction measures against the value of averted losses over the lifetime of the investment should provide a roadmap to prioritize efforts and maximize the efficiency of taxpayer funded initiatives.

[1] New Orleans tax report, 2016
[2] Leung & Rispoli, 2011 estimate that businesses contribute 50% to US GDP.

4 Risk model and assessment of SWB assets under current protections

Utilizing its proprietary Tropical Cyclone model for the United States (TCUS), Swiss Re performed a risk analysis using both current climate and future climate change scenarios. TCUS follows the four-box catastrophe model framework[3] (hazard, vulnerability, value distribution, insurance conditions) and includes the most current scientific and engineering research. While the modelling methodology is detailed in a more in-depth Technical Report, a few key points should be considered here.

The model uses over 1 100 historical events over 117 years to develop a probabilistic track set containing 223 400 tropical cyclones. With an annual occurrence rate of 9.46 tropical cyclones per year, this methodology produces 23 600 probabilistic years. Wind footprints are generated for each tropical cyclone based on the methodology developed by Holland (1980; updated 2008).[4,5] Similarly, storm surge footprints are generated using the US National Hurricane Center's Sea, Lake and Overland Surges from Hurricanes (SLOSH) model[6] coupled to a digital elevation model. This model estimates the water depth over land induced by historical and probabilistic hurricanes. Thus, a range of both realized and probable storm surge scenarios are available for the New Orleans metropolitan area.

It should be noted that in the wake of Hurricane Katrina, the USACE made significant improvements to the system of levees and flood walls that surround New Orleans. The impact of these improvements is implicitly accounted for within Swiss Re's storm surge model. This is achieved by assuming that no locations protected by the upgraded infrastructure are exposed to flood levels below the 100-year return period wind speed in the respective calculation unit.

The various types of physical assets are considered within the vulnerability component of the model, which links the event intensity with how various structures will respond to these events, such as a mobile home versus a reinforced concrete warehouse. As such, the model accounts for hundreds of construction qualities and occupancy types. Of relevance to this study is the fact that wastewater treatment plants, freshwater treatment plants and pumping and drainage stations are uniquely considered.

The vulnerability component is combined with the hazard component to benchmark and calibrate the full model. Both insured market portfolios and individual risk portfolios, such as telecommunications and utilities, are run through the model and the losses are compared to reported losses for historical events.

[3] http://www.swissre.com/library/88565222.html
[4] Holland, G. J. (1980). An analytic model of the wind and pressure profiles in hurricanes. Monthly weather review, 108(8), 1212-1218
[5] Holland, G. (2008). A revised hurricane pressure-wind model. Monthly Weather Review, 136(9), 3432-3445.
[6] http://www.nhc.noaa.gov/surge/slosh.php

4.1 Assessment of physical damage potential to the SWB Asset Portfolio

Swiss Re analyzed a portfolio of 203 assets owned by SWB. Sixty-five of these assets were defined as critical by SWB. The replacement value of the building and contents of these assets is USD 3.4 billion; the assets identified as critical account for USD 2.9 billion of the total. The largest critical assets include pumping stations, followed by the Carrollton and Algiers water treatment plants.

Swiss Re ran the complete and critical asset portfolios through the TCUS model and calculated an annual expected loss. The latter was calculated by summing the losses across all events, and dividing by the number of years in the analysis. Some years will have no loss, while others will have large loss events. The annual expected loss shows how much one would have to budget annually to place into reserve for repairs from, in this instance, tropical cyclones. This first model output produces a baseline risk under current climate conditions and takes into account the current flood protection in place such as the Hurricane and Storm Damage Risk Reduction System (HSDRRS). Reflecting property damage only, the annual expected loss to the total portfolio is USD 10.5 million (thereof USD 6.6 million surge). Of this USD 10.5 million, the critical assets contribute USD 9.0 million (thereof USD 5.7 million surge), or 86%, to the total expected loss. The enhanced flood protection implemented by the city in the wake of Hurricane Katrina results in the high frequency part of the curves being dominated by wind losses, and losses beyond 100 years being dominated by storm surge. At 100 years, the physical damage to SWB assets amounts to USD 360 million (thereof USD 270 million surge) or slightly more than 10% of the total asset value. The 500-year return period produces physical damage of USD 1.0 billion (thereof USD 800 million surge).

4.2 Assessment of business interruption loss potential to the SWB

The physical damage to SWB assets, however, does not represent the full extent of the economic loss. The impact of business interruption to SWB revenue streams can be considerable. In 2005, based on trended analysis, SWB was anticipated to collect USD 172 million in revenue. However, as the impacts of Hurricane Katrina lingered for the remaining 130 days of 2005, sizeable drops in revenue are noticed. Considering the impact of historical events, the indexed revenue losses of the SWB are USD 51 million, USD 13 million and USD 11 million for Hurricanes Katrina, Gustav and Isaac respectively. For Katrina, this equated to a revenue loss of approximately USD 380 000 per day.

4.3 Sensitivity analysis of existing flood protections

New Orleans is a highly engineered city, given both its current location below sea level and the catastrophic damage it suffered in the aftermath of the levee failure upon Hurricane Katrina's landfall in August 2005. The levee systems and flood gates protecting the greater New Orleans area were massively improved after Hurricane Katrina. According to the USACE, with the 100-year level protection in place and drainage pumps operating, a 500-year storm event will produce flooding within Orleans Parish from overtopping and meteoric rainfall. However, the level of water will be well below critical depth and manageable in terms of resulting damage. The Federal Emergency Management Agency (FEMA) has certified the upgraded HSDRRS as protecting New Orleans to at least the "100-year" level[7].

[7] D.R. Johnson, J.R. Fischbach, K. Kuhn, Current and Future Flood Risk in Greater New Orleans, RAND Corporation

While the HSDRRS protects New Orleans, it has only been tested once with Hurricane Isaac. In this case, the flood protection system proved successful in protecting New Orleans against storm surge. However, utilizing this single instance to assume the viability of the system beyond the design return period, when performing baseline modelling, would be optimistic. As such, Swiss Re modified the assumption about the return period to which the HSDRRS protected New Orleans. It did this to both demonstrate the importance of the HSDRRS and how further enhancing (or reducing) the level of protection might impact physical damage losses to the SWB.

The 200-year sensitivity run, which assumes that there are no storm surge damages as long as wind speeds do not exceed the 200-year return period, reduces the annual expected surge loss to USD 4.0 million or 40%. In this scenario, the 100-year storm surge property damage is very small, while the 500-year storm surge loss is reduced to USD 710 million, which corresponds to a reduction of slightly more than 10%.

Additionally, a 400-year sensitivity run was conducted again assuming that no surge damage is sustained as long as wind speeds do not exceed the 400-year return period. At this level of protection, the annual expected loss from surge is reduced to USD 2.2 million or a reduction of two thirds in property damage. The 100-year storm surge does not produce any damage, while the 500-year storm surge continues to produce a physical damage of USD 560 million, which corresponds to a reduction of 30%.

The protection through HSDRRS (whether to the 100-year level or higher) implies that individual hardening of SWB assets within the HSDRRS perimeter will be most effective if designed to very high protection levels of 100 years or more.

4.4 The impacts of future climate risk

As the climate continues to evolve in the coming decades, one can expect additional challenges particularly for near-coastal assets. For the purposes of this analysis, Swiss Re utilized 2050 climate change scenarios. The intention is not to represent the year 2050 exactly, but rather a time frame of 30 to 50 years. Utilizing the latest climate science on how climate change can impact hurricanes, Swiss Re relies on external analysis according to the Intergovernmental Panel on Climate Change scenarios[8]. The utilized scenario concludes that within the Atlantic Basin, the total number of tropical cyclones is likely to decrease, but the number of intense hurricanes (Category 4 or 5 intensity on the Saffir-Simpson Scale) are likely to increase. By the year 2100 under this climate model, it is expected that the number of major hurricanes (Category 3 and above) will increase by 40%.

The effects of storm surge in low-lying areas will worsen due to increasing sea levels. There are several causes for this including ocean thermal expansion. However, one that is particularly impactful for New Orleans is subsidence. Some studies estimated that parts of New Orleans are sinking at a rate of up to two inches per year[9]. Global models and regional projections predict increases of 0.9 to 2.5 feet of sea level increases by mid-century[10].

The risk to the SWB from storm surge-induced flooding will increase significantly by the 2050s due to shifts in both sea level rise and hurricane occurrence. By 2050, rising sea levels and changes to the frequency and intensity of hurricane events are expected to increase the SWB's annual expected loss by 90% to USD 12.5 million from storm surge and by 55% to USD 6.0 million from wind. A 100-year loss increases to an estimated total of USD 790 million while the 500-year loss from physical damage increases to USD 1.4 billion. Consequently, resilience measures designed to harden individual SWB assets will become increasingly important under changing climate conditions.

[8] https://www.gfdl.noaa.gov/global-warming-and-hurricanes/
[9] http://www.jpl.nasa.gov/news/news.php?feature=6513
[10] http://sealevel.climatecentral.org/uploads/ssrf/LA-Report.pdf

5 Resilience measure analysis to protect SWB assets

5.1 Operational improvements

As a result of the site visits and discussions with SWB management, we identified the following operational and process improvements which would contribute to the organization's overall resilience. These include the following:

5.1.1 Improve energy reliability measures

In defining the scope of work for our assignment, the SWB management highlighted the stresses on the organization's daily operations due to the availability issues of the power supply. It consequently requested a proposal for improvement opportunities.

- The fieldwork analysis and modelling performed confirmed the availability issues. However, it also identified the risk of complete disruption in the event of wind due to the fact that the power provided by Entergy is delivered above ground from its substation to the SWB Carrollton plant as well as to numerous critical pump stations.
- Although the SWB has already taken positive measures to reduce the exposure to temporary supply failures by installing emergency generators at critical locations, and by shifting its energy mix to rely mostly on self-produced energy, the latter still relies on steam generation. This utilizes refurbished 1920s equipment which is inefficient, well beyond its functional life span and not cost effective. After 80 years without any major power outages the SWB has experienced at least 4 major failures and several other 'near failures' since Hurricane Katrina.
- The numerous brief disruptions of power from the utility, which have been well documented by the SWB, have severe impacts on the drainage and purified water systems. For example, brief power disruptions lengthen the time to drain storm water as well as cause sudden drops in water pressure, which can ultimately result in mandatory 'boil water' orders.

To improve power supply reliability, cost effectiveness and eliminate exposure to wind events, we recommend building a new substation at the Carrollton site, which would be connected to the Entergy transmission substations via two underground transmission cables.

All details of the project including specifications, project planning, required legal and engineering expertise, costing, payback of project are available in a separate report. However, we should point out that the cost of implementation is estimated at USD 60-70 million with a 4- to 5-year payback based on estimated annual savings.

5.1.2 Define a recruitment strategy to include alternatives and succession planning to reduce impact of a shortage of skilled human resources

- Given the type of operations and the nature and age of the assets, the SWB requires a highly skilled workforce. Furthermore, there is strong dependency on specific members of staff who are critical to maintaining operations (e.g. Power Dispatcher Operations Central Control). The SWB organization has a planned workforce capacity of 1 200 people. However, as at June 2016, there were approximately 125 open vacancies to be filled and around 245 people eligible for retirement.
- We therefore recommend identifying key staff and formalizing succession planning for them. In addition, an in-house staff-hiring process needs to be developed in order to on-board staff faster. Moreover, we recommend sub-contracting or outsourcing certain positions to compensate for vacancies on critical positions. The HR strategy should also aim to further develop relationships with local universities and colleges and extend this approach to other states.

5.1.3 Improve protection of assets against fire/explosion hazards

During site visits, we observed that protection measures against fire/explosion hazards were insufficient.

- We noticed fire hazards due to the use of flammable or combustible products (diesel or oils for example). These products, coming into contact with heated items, could cause fire or explosion. In other areas, we observed the presence of wood or other flammable goods which would feed or spread fire.
- At the time of site visits, with the exception of certain buildings mainly located at the Central Yard, we only observed manual extinguishers. Some larger equipment, considered critical in terms of resilience or business continuity (e.g. turbines, transformers or backup generators) had no automated protection and are located in non-compartmentalized buildings. Since handheld extinguishers would be ineffective in the event of a fire, there is a high risk that the entire building would be destroyed.

SWB management should engage in full fire/explosion hazard assessment. This is considered a quick win since the time of assessment and related expenditure is minimal (USD 500 000 to USD 800 000 for turbine protection, and USD 2 million for large drainage pump stations, and other critical assets) in relation to the risk exposure. Protective measures against fire/explosion are key to evaluating risks covered by property damage and business interruption insurance policy premiums. Rapid action on this aspect could have significant value in premium negotiations. All sites should be considered, but priority should be given to sites such as the building where the turbine is located, the power building and the drainage pump stations with large backup generators (e.g. Drainage Pump Stations 6, 13).

5.1.4 Elevate storage of critical parts to reduce damage from flooding

During the course of site visits, we noticed that storage of critical parts could be improved since current storage practices expose these goods to damage from flooding.

SWB management should identify critical parts located in the onsite warehouses and elevate their storage to prevent their being damaged by flood:

- above 6 feet for the Central Yard warehouse
- above 12 feet for Algiers
- above 5 feet for Carrollton

5.1.5 Establish additional storage of critical parts for Algiers plant to improve reliability of supply

Storage of critical parts is located at a central location. The Central Yard warehouse and the Carrollton plant have dedicated storage capacity located onsite. However, the Algiers Plant does not have storage on site. Moreover, due to the location of the Central Yard warehouse, there is a potential risk that provision of supplies to the Algiers plant may be compromised or delayed, which would impact operations.

- SWB management should consider establishing a dedicated storage facility at the Algiers Plant for minimal backup supplies in existing buildings such as the old Head House where space is available. The added benefit will be to provide backup of critical parts to other sites in the event of the Central Yard becoming inaccessible. We estimate associated cost to be less than USD 500 000 for a significant reduction in exposure of said parts.

5.1.6 Input operations data into IT system to improve operational intelligence

The operations of the SWB assets and operations remain very manual since all operational data is collected and hand-written into log books. Although it appears that staff is diligent in collecting the information, the data cannot be analyzed and used for maintenance of operational improvements. Furthermore, we note that the maintenance policy largely focuses on corrective rather than predictive and preventive maintenance (75%/25%) which is not operationally and financially efficient.

- We recommend that all historic data be computed into an IT system and analyzed. Moreover, the Reliability Centered Maintenance methodology should be applied with key performance indicators used to improve operational efficiency and maintenance planning.

5.1.7 Develop an IT Dashboard of the SWB network to improve visibility of operations

The Central Control room at the Carrollton plant relies on paper charts of the operations framework. Operators manually update these with the help of basic communications (phone and radio) with the individual assets. There is no real-time view of the functioning of operations.

Central Control, serving as a hub of communications, has a critical role in many emergency operational situations. It is responsible for verifying and enforcing SWB's safety clearance procedures and associated clearances within the power distribution system.

In addition, it monitors local and regional weather to provide advance warning of storms which could affect power generation requirements for the drainage and sewerage systems. It also coordinates the various power supplies, including alternative backup power supplies. Additionally, the Central Control provides valuable information to the Office of Emergency Preparedness (OEP) during emergencies such as hurricanes, floods and freezes. It does this through established Board protocols. Lack of staffing continues to be a major issue for Central Control.

- SWB should automate this process to initially give visibility of the actual status of the various systems receiving power across the SWB power distribution system. There are approximately 244 points that can be automated using existing SCADA systems. We estimate the associated cost for the initial step (detailed in the Technical Report) to be USD 500 000 with an additional annual recurring cost of USD 15 000.
- A second step would be to automate the power distribution system with the Central Control room operators being able turn pumps on and off based on actual water levels. This action is estimated at USD 1.5 million.
- This would result in a significant reduction of dependency on manual processes and significant gain in remote control of operations.

5.1.8 Supply chain risks should be mitigated with further formalized analysis of dependencies

- With the robust machinery and skills of the people at the Facility Maintenance shop, the SWB is still able to keep 80+ year old equipment running. However, an equipment failure puts the component out of service until Facility Maintenance can repair or manufacture the needed components. Moreover, recovery time from a severe flooding event would not be minimized by storing critical components off-site. The aged equipment means there are no available manufacturers for spare parts to be purchased and stock-piled. In financial terms, these circumstances are probably a good deal more costly than would be a planned asset replacement approach and subcontracting of highly specialized maintenance functions.
- Where spare parts can be sourced, SWB maintains a large warehouse and dedicated staff to manage inventory. Their facility and processes are impressive. However, the main weakness of their inventory processes is a lack of interconnection with their antiquated CMMS system. This is a custom solution originally developed for SWB in the 1970s which was continually upgraded until the last update in the late 1990s.
- Many of the chemical suppliers for the water plants are based in St. Louis, Dallas, or Florida. This fact can be considered as positive in terms of exposure and resilience. However, in light of the plants' limited onsite storage capacity for some of these products, the resilience factor is weakened in the event of difficulty in accessing the plants for delivery. In addition, deliveries often do not arrive on time due to restrictions on driver working hours.

SWB management should analyze dependency on key suppliers and supply chain risks for critical parts. They should also formally establish alternative supply possibilities from alternative providers.

5.1.9 The risk of internal flooding of the East Bank WWTP site should be mitigated with the implementation of a by-pass of influents.

Since the site is protected by a flood wall, the Swiss Re modelling does not account for the specific risk of internal flooding from storm surge or excessive rainfall identified for the East Bank Waste Water Treatment Plant (East Bank WWTP). The protective measures for this particular risk should be treated by establishing a by-pass at the East Bank WWTP to avoid risk of flooding inside the facility.

The East Bank WWTP was heavily damaged by Hurricane Katrina, including extensive flooding of the entire site. As mitigation, an 18 feet tall surge/flood protection wall was subsequently built around the entire perimeter of the site and many buildings were raised. According to Swiss Re's modelling, these mitigation actions provide adequate storm surge/flooding protection. However, a risk remains in relation to flooding of the plant from possible excess influent flow, if the sewerage pump stations that feed the plant exceed the plant's peak hydraulic capacity.

To avoid damage to the plant, there is a need to reconfigure the existing headworks influent channel to incorporate a new overflow that directs flows exceeding the plant's peak design capacity to the existing plant drainage pump station. The estimated capital cost for this mitigation measure amounts to USD 6 million and is detailed in the Technical Report.

5.2 Surge hardening measures on SWB asset losses

Based on extensive site visits, we have defined and quantified the costs of hardening measures for all assets that SWB classified as critical. Hardening measures include raising sites/assets as well as flood and wind proofing. In order to test sensitivity, we used two benchmarks for raising sites/assets: (a) Expected water depths at 100- and 500-year surge events from the university of Louisiana's map that uses the Flood Insurance Rate Map data from FEMA (http://maps.lsuagcenter.com/floodmaps/) and from USACE. These scenarios assume that the physical flood protection system of the city holds and 100% pumping capacity. These scenarios assume that the physical flood protection system of the city holds, (b) Swiss Re-expected water depth ranges at a 100-year surge event after a failure of flood protection measures, rendering the impact of pumping irrelevant.

Given SWB's large-scale flood protection infrastructure, the additional storm surge hardening proposed by us on the basis of USACE 100-year and 500-year flood depths do not have a significant impact in terms of avoided losses. The annual expected physical damage from storm surge to all assets is reduced by approximately USD 120 000 or less than 2%, to USD 6.5 million.

Hardening measures proposed on the basis of Swiss Re's estimated 100-year flood depth ranges reduce the annual expected loss by slightly less than 50% to USD 3.8 million (i.e. an annual saving of USD 2.8 million). The complete set of identified hardening measures on the critical assets list amounts to a total of USD 690 million.

The analyses of the reduction in risk profile (% decrease of expected loss before and after mitigation) and the investment required relative to the asset insured determines a prioritized action plan ("strategic action plan") to assist in how to allocate capex more appropriately.

As a result, the focus can be placed on the "must have" mitigation measures for critical assets, while still paying close attention to "quick wins" (highest reduction with the least investment) versus the "good to haves" (high reduction but relatively high investment).

This strategic action plan amounts to a total investment of USD 404 million (equivalent to 25% of total value of assets selected in this plan for a reduction in expected loss of 64%).

5.2.1 "Must haves" correspond to a total investment of USD 160 million (46% of asset value) for a reduction of 60% in expected losses:

- For Station 4 at the East Bank Drainage Pump Station (investment USD 20.7 million, 19% of asset value for 63% reduction in expected loss), the mitigation measures include:
  - The elevation of the station by 12 – 13 feet to prevent flooding and relocation of electrical devices out of the basement.
  - The installation of a 3 750 kW generator with foundations, an Automatic Transfer Switch and a 10 000 gallon fuel storage capacity.

- For Station 7 at the East Bank Drainage Pump Station (investment USD 52 million, 58% of asset value, for a reduction of 61% in expected losses), the mitigation measures considered are:
  - The elevation of the station by 10 feet to prevent flooding and the relocation of electrical devices out of the basement.
  - The installation of a leakage pump system in the 25 Hz building.

- For Station A at the East Bank Sewerage Pump Station (investment USD 7 million, 15% of asset value for 43% reduction in expected loss), the mitigation consists of rebuilding the facility with the first floor elevation at 10 feet above surrounding ground, with a backup generator and placing the fuel supply at first floor elevation. This measure would also contribute to the hardening of the asset, since we noted that the wall of the building is deteriorating.

- For Station 11 at the West Bank Drainage Pump Station, (investment USD 60 million, for a reduction of 56% in expected losses), the mitigation measures considered are:
  - Elevating the station by 10 feet to prevent flooding

- For West Bank Waste Water Treatment Plant, (investment USD 20 million, 20% of asset value for 62% reduction in expected loss), the proposed mitigation is to construct a surge/flood protection perimeter wall for the site (including all associated planning, design, engineering, site works, ancillary works/structures, construction management, commissioning, training, etc.)

5.2.2 "Quick wins" correspond to a total investment of USD 6.5 million, 1% of asset value for a reduction of 72% in expected losses:

- For Station 14 at the East Bank Drainage Pump Station (investment USD 1.1 million, 3% of asset value for 76% reduction in expected loss), risk should be mitigated by:
  - Raising the 60 Hz transformer platform by 5 feet above ground
  - Adding a new transformer

- For Station 16 at the East Bank Drainage Pump Station (investment USD 1.1 million, 3% of asset value for 77% reduction in expected loss), the mitigations are composed of:
  - The installation of one 50 kW house generator
  - The elevation of the transformer platform by 5 feet
  - The addition of a new transformer

- For Station 20 at the East Bank Drainage Pump Station (investment USD 1.1 million, 7% of asset value for 99% reduction in expected loss), risks could be mitigated by:
  - Raising the 60 Hz transformer platform
  - Adding a new transformer
  - Returning failed pump to service

- For Carrollton Water Treatment Plant (investment USD 3.2 million, 0.3% of asset value for 70% reduction in expected loss), the proposed measure is to construct an 8 feet flood protection for about 10 installations.

- Finally for the Algiers site, the option proposed is a quick win in terms of investment in relation to the risk reduction obtained. However, since the solution of building a wall may not be acceptable to the local public, the mitigation measures proposed also include a potentially more acceptable alternative. The more straightforward option is to build a flood protection wall around the whole plant. An alternative could be to limit flood protection measures to specific individual assets. However, the cost for either option is estimated to be the same (USD 21 million), but with a significantly different impact on the reduction on the risk profile.

5.2.3 "Good to haves" correspond to a total investment of USD 277 million, 51% of asset value for a reduction of 56% in expected losses:

- For Station 19 at the East Bank Drainage Pump Station, (investment USD 63 million, 52% of asset value for close to 100% reduction in expected loss), mitigations consist of:
  - Raising the critical equipment above 12.5 feet elevation
  - Adding a new transformer

- For Station 3 at the East Bank Drainage Pump Station, (investment USD 53.5 million, 43% of asset value for 79% reduction in expected loss), proposed measures are to:
  - Elevate critical equipment above 11 feet
  - Relocate electrical out of basement and seal conduits in the basement

- For Station 6 at the East Bank Drainage Pump Station, (investment USD 160.7 million, 53% of asset value for 42% reduction in expected loss), the recommendation is to raise the whole equipment by 8 feet.

In addition to these measures, specific measures to improve reliability and resilience to wind have been identified for particular assets or sites.

- Hardening measures to improve reliability include:
  - Installing two 3 750 kW generators with foundations, an Automatic Transfer Switch and a 10 000 gallon diesel storage for the Carrollton Frequency Changer for an estimated capital cost of USD 7.4 million.
  - Adding a new transformer at the Pritchard facility at the East Bank Drainage Pump Station for an estimated capital cost of USD 200 000.

- Hardening measures to resist to storm for:
  - Drainage Pump Station 5:
    - Reinforce the roof structure of the old building for an estimated capital cost of USD 2 million.
  - Drainage Pump Station 10:
    - Add a new 60 Hz generator for an estimated capital cost of USD 4 million
    - Install hurricane rated equipment for an estimated capital cost of USD 150 000.
  - Drainage Pump Station 17:
    - Add a new 60 Hz generator for an estimated capital cost of USD 4 million
    - Reinforce the roof and structure for an estimated capital cost of USD 4 million
  - The Dwyer facility at the East Bank Drainage Pump Station:
    - Add a new 60 Hz generator for an estimated cost of USD 4 million
  - The Algiers site:
    - The high lift pump number 1 building should be hurricane-proofed, the cable tray buried and the transformers elevated, for an estimated capital cost of USD 500 000.
    - The storm proofing costs for the Station C and Ferric buildings are estimated at USD 500 000 and USD 50 000.
  - The storm proofing costs for the recycle basin MCC at the Carrollton plant are estimated at USD 360 000.
  - It is noted that in some cases, the storm-proofing measures also contribute to reducing the fire hazard.

5.3 Examining more efficient and comprehensive insurance coverages

While physical risk mitigation is always a primary priority to reducing future losses, not all risk can be averted. As such, it is important for the SWB to transfer residual risk away from the balance sheet and ultimately the citizens it serves. The SWB manages a property insurance program for its assets, which consists of both private commercial insurance and the National Flood Insurance Program (NFIP). With a portfolio exposure in excess of USD 3 billion, appropriate levels of insurance are critical to manage the residual risk, particularly with a 100-year return period loss potential of USD 360 million or 10% of the entire portfolio. Existing insurance purchases include USD 10 million of "named storm" coverage, however this does not include loses resulting from flooding or storm surge. For flood exposure, the SWB purchases individual NFIP policies on eighty-one critical assets, each with a maximum policy limit of USD 500,000. The limit of liability for these policies total USD 31m for the physical buildings or 1% of the total value of the properties.

- We recommend implementing new insurance solutions and increasing policy limits to ensure maximum coverage for residual risk. These solutions could be deployed on an individual asset basis, however a more efficient approach may be to introduce a "macro-hedge" against the entire portfolio as to eliminate existing coverage gaps, gaps in federal reimbursement and increase the speed at which insurance proceeds are received to facilitate SWB liquidity and rapid response.

6 System critical scenarios and their impact on SWB revenues and economic output of the city

We also identified 3 system-critical failure scenarios, including damage to the Recycle Basin MCC of the Carrollton Water Treatment Plant, the West Bank Control Room and East Bank Sewerage Pump Station A.

Wind damage to the roof of the Recycle Basin MCC building triggers the first scenario. The roof of the MCC building is metal. During major hurricane events wind speeds can reach between 120 and 156 mph causing severe damage to buildings, more specifically their metal roofs, pealing them away and exposing the MCC to the elements. The rain causes the electrical equipment to short and either trip the circuit breakers or cause fires. The Recycle Basin MCC could be fully destroyed. Consequently the recycle basin pumps will be unable to backwash the sand filters. Eventually the Water Treatment Plant would be forced to shut down after one day, leaving residents and businesses without fresh water. We calculate the downtime necessary to rebuild the MCC at approximately 30 days.

Since the Carrollton water treatment plant services approximately 80% of Orleans Parish, the city may lose GDP of approximately USD 800 million during this period. Revenue loss to the SWB will be in the USD millions. Roof hardening costs amount to an estimated USD 360 000 and are likely to be a good resilience investment for both SWB and the city.

The second scenario affects a raised power cable tray in the West Bank Control Room (Station C Building). During major hurricane events, strong winds can cause flying debris to damage Station C's building roof and the raised power cable tray. The two feeders from Entergy supplying power to the Control room switchgear would be lost. Carrollton's remaining 25 Hz feeder number 26 would also be down. Control would start the generator to supply 60 Hz power to the plant. The power cables to the pumps for the water intakes, which supply water to the Algiers Water Treatment Plant from the Mississippi, would also be lost, shutting down the plant entirely. Residents and businesses would lose water supply after one day. Downtime to enable replacement of the power cables is estimated to be 15 days. Since the West Bank services approximately 20% of Orleans Parish, the city may lose approximately USD 100 million in GDP. Revenue loss to the SWB will be in the USD millions. Hardening costs of the Station C roof amount to an estimated USD 500 000 and are likely to be a good resilience investment for both SWB and the city.

A third irreplaceable asset is the East Bank Sewerage Pump Station A. If Station A fails for whatever reason, no sewerage would be pumped from the Central Business District and from Sewerage Pump Stations 1, 3, 5, 6, 8, 9, 14 and 15. As a result, sewerage would back up. Downtime to repair is estimated at 2 weeks, but it is difficult to quantify affected GDP. Revenue loss to the SWB will be in the USD millions. Hardening costs amount to an estimated USD 7 million.

7 Conclusions

Since the existing level of protection is already at a high level, a general hardening of all critical SWB assets against physical damage does not appear to offer the best value for money. Instead, the most impactful course of action promises to be a two-pronged approach which focuses on reducing downtime of SWB operations (and therefore negative indirect damage to the city) and hardening of individual assets with the highest reduction in annual expected losses. One month of city downtime represents 5 times the expected annual damage to city assets.

8 Recommended next steps

1. Discuss the opportunity to implement the strategic action plan.

2. Perform an analysis of SWB's risk tolerance in light of the risk exposure and associated mitigation actions to review existing capital expenditures and determine a revised investment plan.

3. Analyze interdependencies of various assets and critical business interruption scenarios in more detail. The indirect impact on New Orleans is significant.

4. Assess and develop emergency response and recovery interventions that can reduce downtime in the case of flood wall failure.

5. Identify risk transfer options that complement existing and potential future protection measures of SWB assets; identify risk transfer options that pre-finance emergency response and recovery interventions

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Attachment 7-4

An Independent Comprehensive Review of the Washington Aqueduct

Report by
Veolia to DC Water

Achieving excellence from source to tap

An independent comprehensive review of the Washington Aqueduct

EXECUTIVE REPORT

VEOLIA
WATER

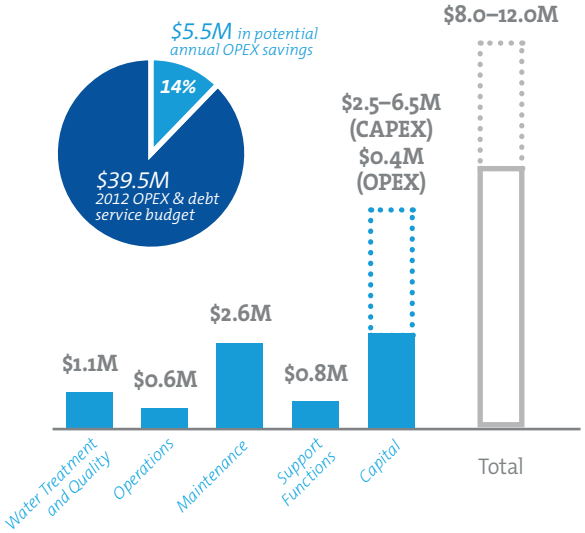
b

Executive report

Veolia Water details herein its findings and recommendations to help the Washington Aqueduct achieve substantial savings while improving quality.

In June 2013, the District of Columbia Water and Sewer Authority (DC Water) selected Veolia Water to conduct an independent and comprehensive study of the Washington Aqueduct. The goal of this study was to identify opportunities to foster the continued development of a world-class operation at the Washington Aqueduct with a focus on operational efficiency, quality, and reliability. From July through October 2013, Veolia Water's team of experienced water-system operators and Subject Matter Experts (SMEs) worked alongside the Washington Aqueduct's management and employees to identify opportunities to make improvements to every aspect of the Aqueduct's operations. As an organization, the Washington Aqueduct showed a high level of commitment to performance improvement and openness to collaboration throughout this project. The project's slogan, "Achieving Excellence from Source to Tap," reflects the Aqueduct's goal to supply high-quality, reliable and cost-effective water from the source to the tap of the residents in the District of Columbia, Arlington County and the City of Falls Church. The recommendations presented here will help the Washington Aqueduct provide these services more efficiently from a cost and organizational standpoint, **while improving the already high level of service and quality** that it provides to its customers.

Veolia Water identified up to $12.0M in annual savings across the focus areas



Veolia Water reviewed every aspect of the Aqueduct's operations, including the treatment process, maintenance and support functions. The review included the Aqueduct's capital program and an assessment on the key financial metrics and a high-level asset valuation. We benchmarked the Aqueduct operations against similar operations (including some of Veolia Water's own operations) to identify gaps in performance and efficiency. Staff were interviewed from the Washington Aqueduct, the U.S. Army Corps of Engineers (USACE) and DC Water. Documents, contracts, financial statements and technical documents were analyzed. More than 100 hours of maintenance work were observed. In this executive summary and throughout the report, the recommended initiatives are presented by the focus areas used to assess current practices. Based on Veolia Water's analysis, implementing these ideas will result in estimated savings of approximately 14% of the current operational cost (based on the $39.5 million executed budget in 2012), and potential savings in the capital budget between 20-40%. Additionally, some of the proposed initiatives will improve quality and reliability—for example, this review includes a treatment recommendation to mitigate red-water issues in the distribution system.

$1.1M
in annual estimated savings potential in process and water treatment initiatives.

A. Water treatment and quality

The Washington Aqueduct has done an excellent job of meeting the drinking water standards and reliably supplying DC Water, Arlington County and the City of Falls Church with high-quality drinking water. Veolia Water reviewed the treatment processes together with management and operators at the Washington Aqueduct and developed a list of initiatives that may enhance the water quality while potentially reducing operating costs up to $1.1 million. The initiatives are grouped into three key focus areas: minimize chemical dosing; reduce filter-backwashing volumes; and optimize water quality from source to tap.

A1. Minimize chemical dosages

Based on Veolia Water's experience in running water treatment plants around the world, the Aqueduct could make some changes to chemical treatment that cannot only improve quality but also reduce chemical costs up to $868,000 dollars annually. These specific recommendations include targeted process enhancements and the use of certain alternatives to current products, for example, minimizing the use of caustic soda with lime replacement and exploring the use of alternative coagulants.

A2. Reduce backwash volumes

Veolia Water conducted an in-depth analysis of the filtration and backwash operations for the Dalecarlia and McMillan plants. This analysis shows that a targeted reduction in backwash duration will not undermine the quality of the filtration process and will result in significant savings in wash-water volumes. Up to 1.084 billion gallons of water can be saved per year, which is equivalent to combined chemical and energy savings for both treatment plants of up to $266,000 annually.

A3. Optimize water quality, source to tap

Water quality data from each treatment plant as well as from the DC Water distribution system was reviewed to identify possible treatment measures that might improve water quality from the source to tap. In addition, chlorine decay analyses were conducted to evaluate the potential reduction in chlorine residual concentrations due to water-residence time and water age in the distribution system. Hydraulic modeling also was conducted for the DC Water system to assess water-age predictions for the system and to verify predictions made from chlorine-decay evaluations.

Identified recommendations from these evaluations will lead to specific treatment adjustments and operational changes that are expected to improve water quality for the consumers. Some of the specific treatment adjustment recommendations include improving the coagulation and sedimentation processes in both water treatment plants; adding more flexibility to chlorine and ammonia feed

POTENTIAL BACKWASH OPERATING CHANGES SAVINGS

Facility	Current backwash per cell	Target backwash per cell	MG saved per year*	Savings per year
Dalecarlia West	23 minutes	8 minutes	300	$73,000
Dalecarlia East	14 minutes	8 minutes	280	$68,000
McMillan	18.5 minutes	8 minutes	504	$125,000
Total			1,084	$266,000

**** includes washwater, surface wash and filter-to-waste volumes***

points for disinfection of the water, that could result in less chemicals being pumped to the system; and implementation of new chemical treatment to help mitigate iron dissolution (red-water occurrences) in the peripheral areas of the DC Water system. Chlorine-decay evaluations established the likely water age in most of the distribution system, corresponding to water quality monitoring sample results routinely collected from numerous locations throughout the system. Areas of highest water age appeared to be on the eastern-most edge of the system in the Anacostia area and may be impacted by some of the water storage facilities. Installation of mixing systems was suggested in these storage facilities to reduce water age and to increase chlorine residuals in those areas.

It is believed that implementation of the suggested initiatives will result in improved quality both in the finished water at the plant level and ultimately at the customers' taps. Many of the initiatives have relatively small estimated capital costs (or no capital costs), yet are predicted to produce cost savings either through the reduction in chemicals or reduced use of water for filter cleaning and maintenance.

B. Operations

$0.6M
in annual estimated operational efficiency savings potential.

Veolia Water conducted a thorough operational review of the Washington Aqueduct that included key aspects of the operations, such as staffing and shift models at the plants, pumping energy efficiency, the Residuals Processing Facility, lab operations, operating costs for both Dalecarlia and McMillan, fleet usage and metering accuracy. For many of these areas, the Washington Aqueduct's operations were in line with Veolia Water's benchmarks. However, the areas for improvements that are highlighted below will help the Washington Aqueduct achieve greater operational efficiency.

B1. Assess staffing needs in treatment plant operations

The overall operations staffing levels in the Dalecarlia and McMillan treatment plants are in line with Veolia Water's benchmarks for plants with comparable treatment technologies and capacities. However, the Washington Aqueduct can provide cross-functional training that will allow the operators to take on additional responsibilities. For example, the control room operators can be trained on chemical handling and the outside operators could be trained on SCADA monitoring. Having a leveled set of skills among all operators at the plants will allow for greater flexibility in scheduling the shifts, perhaps greater job satisfaction, and potential reduction in overtime.

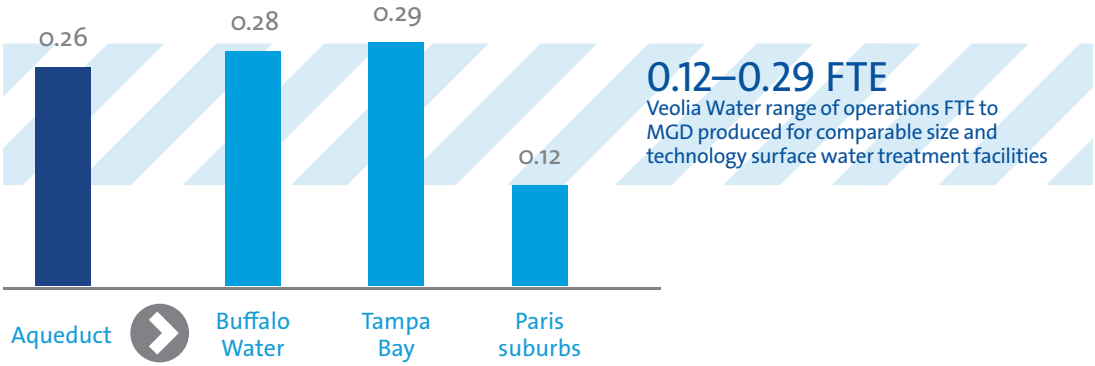
B2. Reduce pumping energy use

Tracking the electricity consumption against the pressure and flow will allow the operators to monitor pumping efficiency on an ongoing basis. PEPCO, the electricity provider in the D.C. area, can provide the Aqueduct with advanced metering technology (at no charge) that will connect to the SCADA system to monitor energy consumption. Additionally, pumping efficiency could be increased between 5–12% by coating the pumps when they go out for refurbishment. Veolia Water estimates that coating all of the pumps will result in approximately $250,000 in energy savings.

B3. Optimize Residuals Processing Facility (RPF) operations

The RPF was completed in 2012. The RPF receives residuals from three locations: the Dalecarlia Water Treatment Plant (WTP), the Georgetown Sedimentation Basins, and the Forebay. Approximately 10,000 tons of residuals are generated each year at the RPF and transported offsite. The contract to transport and dispose the sludge offsite is very well

Operations benchmarking (full-time equivalent versus MGD of water produced) compared with a few large and distinct Veolia Water operations



priced and conforms to typical industry terms for the regional disposal market. On the other hand, the RPF operations can be optimized to increase the sludge's percent solids from the gravity thickeners (GT). Maximizing the sludge cake to yield lower sludge-output tonnage will reduce gravity thickener usage and centrifuge run times to save on operational costs. The expected cost savings resulting from these operational improvements are estimated to be approximately $342,000.

$2.6M
in annual estimated maintenance savings potential.

Additional recommendations from the operational review include:

- **B4.** Sustain lab productivity and organizational efficiency while improving some of the lab's processes.
- **B5.** Use tools for best-in-class operations practices and compliance, such as Triple I (Injury, Illness, and Injury), Root Cause Analysis (RCA), e3 – Environmental Management Information System (EMIS), and electronic O&M manuals.
- **B6.** Optimize fleet use.
- **B7.** Replace inaccurate flow meters.

Lastly, as part of the operations review, Veolia Water also conducted a regulatory-compliance review on federal, district and local regulations and ordinances. No items were found to be out of compliance with the existing regulations.

C. Maintenance

The maintenance personnel at the Washington Aqueduct are highly skilled, and they take great pride in their work and have a strong sense of ownership. This is immediately reflected in the cleanliness and overall good condition of the assets. Despite these strengths, there are opportunities to aspire to a world-class level of performance. The Aqueduct's maintenance program would benefit from a formalized asset management program that would be supported by a realigned organization.

C1. Refocus maintenance efforts to what is most important

As an essential first step to building a formalized asset management program, the Aqueduct should conduct a detailed criticality analysis for all of the Washington Aqueduct's assets to optimize maintenance spend. The criticality analysis should also include a Reliability Centered Maintenance (RCM) review of the most

critical systems to identify risks associated with asset failure, to estimate the cost impact and to establish scheduled and tracked tasks to mitigate the risk. In addition, the Washington Aqueduct should establish disciplined policies and procedures for tracking time and materials in the computerized maintenance management system (CMMS).

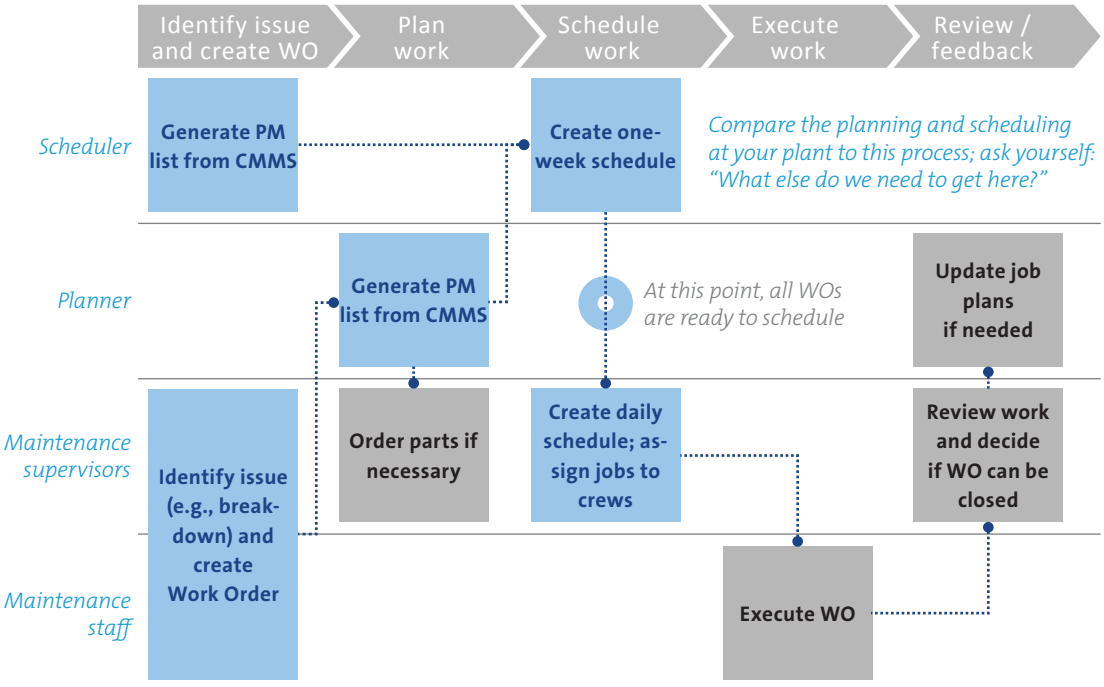
C2. Increase maintenance shop productivity with planning and scheduling

The maintenance function at the Aqueduct has no formal system for planning and scheduling work orders. This results in productivity losses and delays in completing and closing out work orders. The Aqueduct should invest in making planning and scheduling a core competency to improve efficiency. Planning and scheduling increases productive ("wrench") time by increasing work coordination among trades and staff, allocating the right crew (right person-hours and competencies for the job) and making sure tools and parts are available when needed.

C3. Change the maintenance organization to best meet needs

The people at the Washington Aqueduct are its greatest asset. There is great depth of expertise in the maintenance organization's various specialty shops. While the specialized technical skills of each of the maintenance shops are impressive, the current division of the maintenance organizational structure into individual maintenance shops (and by plant) isolates resources and does not encourage cross-skilled maintenance activities that would increase productivity. A centralized maintenance organization and integrated maintenance shops would enable cross-skill training and collaboration in support of a comprehensive asset-management approach. This organization should include a new planning function responsible for work prioritization and planning. The

Example of process flow for the implementation of planning and scheduling



planning function will also be responsible for ensuring the data in the CMMS system is complete and accurate.

Veolia Water estimates that implementing the recommended maintenance-related initiatives can result in operational savings up to $2.6 million annually in the long term after the recommended maintenance reorganization takes effect.

$0.8M
in maximum annual estimated savings potential in the procurement of chemicals.

D. Support functions

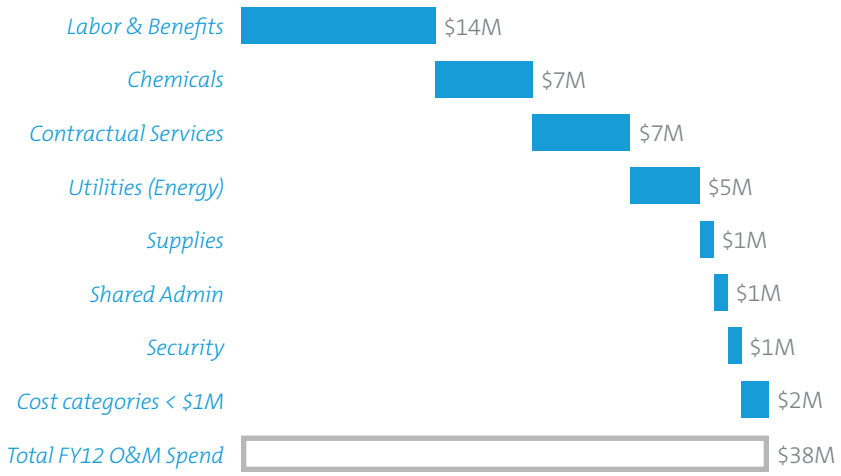
Veolia Water reviewed the level of service and current processes of four key support functions – Procurement, Health & Safety, Human Resources, and IT. As part of the Federal Government, the Washington Aqueduct pays a fee to the USACE Baltimore District to administer the Procurement and Human Resources (HR) processes, and soon USACE will also be responsible for IT support, as well. For example, any purchases over $3,000 need to be contracted by the Baltimore District under the Federal Acquisition Regulations (FAR). Similarly, the Army HR Shared Service Center in Baltimore has the bulk of the responsibility for the recruiting and hiring process. The IT function is transitioning from a stand-alone IT management (non-USACE-IT managed or NAM) to IT Management supported by USACE. Conversely, the health & safety (H&S) program is managed internally by the Aqueduct.

The Aqueduct's main opportunities for improvement in the context of the support functions include:

D1. Procure goods and services in the most cost-effective manner available

The Aqueduct spent almost $7 million on chemicals in 2012, which equates to 18.2% of the total spend for that year. Five chemical contracts represent 88% of total chemical dollars spent. While the chemical specifications are well-written, there is an opportunity to achieve significant savings on chemical costs through refinements in the procurement process. Potential savings are estimated to be up to $780,000, depending on the Aqueduct's ability to enter into DC Water's existing Mid-Atlantic Agreement. Different savings scenarios are based on changing contract terms and specifications and expanding the vendor landscape for chemical bids.

Categorization of total FY12 spend



Category	% of total spend
Labor & Benefits	37.3%
Chemicals	18.2%
Contracted Services	17.0%
Utilities (Energy)	11.7%
Subtotal	**84.1%**
Other	15.9%

D2. Implement a best-in-class Health & Safety program

Aqueduct employees are federal civil-service employees subject to federal OSHA enforcement requirements. We found that the Aqueduct's housekeeping practices are excellent. Some examples of the effectiveness of this program include machine guarding and bulk chemical fill ports—where all bulk chemical fill ports were locked, preventing unattended offloading. We also identified a few opportunities for improvements in the area of the control of hazardous energy (Lockout-Tagout, LOTO) program.

D3. Improve collaboration and forecasting in Human Resources between the Aqueduct and USACE

Currently the biggest challenge for the Washington Aqueduct is the ability to hire qualified candidates in a timely manner. Thus, the Aqueduct and the HR Shared Service Center in Baltimore need to identify ways in which they can work together more collaboratively and proactively to overcome this obstacle and to achieve common goals. Moreover, in the long run, the Washington Aqueduct will greatly benefit from supplementing HR administration with a more comprehensive human-capital management approach. At the highest level, this means formalizing organizational development, including training and personnel planning, and integrating this approach into the organization's strategic planning process.

D4. Continue to provide a suitable level of IT service

The IT function provides a good level of service to the organization. However, IT support is in a current state of transition from NAM to corporate IT management supported by the USACE. There are some expected benefits that are likely to result from this transition, such as increased support for enterprise applications, a centralized help desk, and cost savings from the DOD Information Assurance Certification and Accreditation Process (DIACAP). Conversely, there are areas that need to be ironed out as part of this transition, including the level of local IT support and the cost of the USACE IT management fee. The full IT management transition is expected to begin in April 2014.

E. Financial assessment and asset valuation

Veolia Water partnered with a local consulting company, PEER Consultants, P.C., to conduct a financial assessment and high-level asset valuation of the Washington Aqueduct. The scope of the financial assessment included a review of the Aqueduct's financial controls, financial position, rates and revenue, liabilities obligations and major contracts, potential revenue exposure, rate preparation and forward pricing, and other revenue impacts. The findings from the assessment confirmed that the Aqueduct is an organization with adequate internal controls and processes. The Aqueduct's financial profile is strong, with three highly rated wholesale customers. In addition, the rates established by the Washington Aqueduct are competitive in the market for wholesale water. The asset valuation was conducted using several different models, including Original Cost Less Depreciation (OCLD), Replacement Cost Less Depreciation (RCLD), and Capital Replacement Cost using both the EPA Model and Veolia Water's cost model.

F. Capital planning

The Washington Aqueduct currently maintains a 10-year Capital Improvement Plan (CIP), which is updated annually. The Planning and Engineering Branch is responsible for the management and coordination of the capital projects (CAPEX) from planning to completion as well

as major operational maintenance contracts (OPEX budget). A close cooperation takes place between the Aqueduct and the Engineering section of the Baltimore District of the USACE, which is responsible for the design, procurement and delivery of projects. The Planning and Engineering Branch of the Washington Aqueduct is composed of excellent professionals with a breadth of technical knowledge and experience in project execution.

Veolia Water examined the Washington Aqueduct's capital program using the process and tools that we utilize to develop and manage our own capital investments. We recommend four key areas for improvement:

F1. Optimize repair and replacement (R&R) spend using asset value and condition

Veolia Water's approach for determining the optimized capital allocation for R&R was based on analyzing the assets' value and applying percentage ranges to identify the investment needed to prolong the lives of those assets. Based on our model the optimal R&R spend for the Washington Aqueduct ranges from $6–10 million. Therefore, there is an opportunity to strategically prioritize R&R and to identify long-term investments (outside of R&R) needed for the Aqueduct to stay competitive and to provide the highest level of service to its wholesale customers.

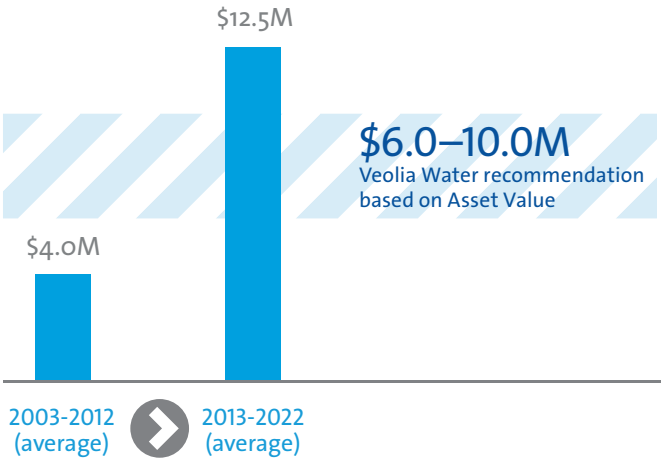
F2. Use tools to develop and prioritize projects in the CIP

Veolia Water recommends that the Aqueduct develop a Master Plan to forecast the needs beyond R&R in terms of capacity, reliability and quality. The Aqueduct should work on developing and systematically using a prioritization matrix, that includes rating factors and evaluation criteria—as of the publishing of this report, the Chief of Engineering has already begun work on a prioritization framework that needs to be further developed and vetted.

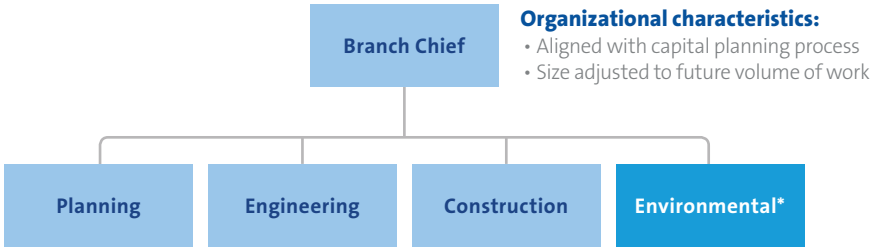
F3. Implement a performance management system to monitor and improve capital planning process performance

The Washington Aqueduct should select the most relevant (no more than five) Key Performance Indicators (KPIs) to define clear targets and support accountability for the delivery of the Capital Program. For example, maintaining

R&R CAPEX spent, forecasted and needed



Potential future Capital Program Management organization



*Consider aligning this function with another branch

change orders to less than 10%, especially in large projects, can result in significant savings—more than $300,000 per year, based on a high-level estimate. In addition, the Aqueduct should consider design-build (DB) as an alternative project delivery method beyond the traditional design-bid-build (DBB) approach. Typically, the DB process can save 10%-15% over traditional DBB procurement.

F4. Align the organization with the capital planning process

Veolia Water recommends reorganizing the engineering department into functional areas based on the construction and delivery of capital projects, such as planning, engineering, and construction. Additionally, the Aqueduct should establish an optimal ratio of engineering staff to the number and cost of projects to manage these efficiently.

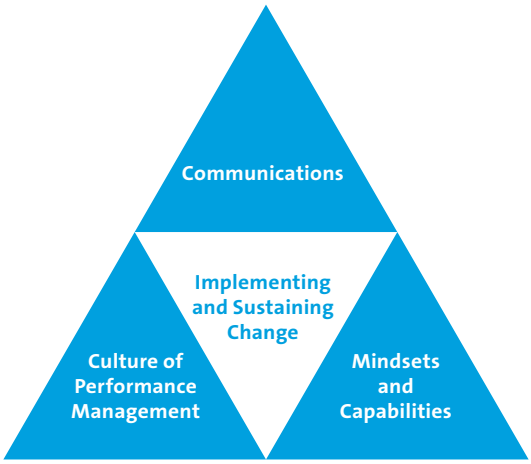
G. Enablers

The success of world-class operations is dependent on more than a set of technical solutions—well-run operations are supported by "enablers" to drive work processes and motivate staff to strive for excellence in all they do. The successful implementation of the initiatives identified in this report will require a high level of involvement and commitment from the staff and management of the Aqueduct. Staff must understand what they are doing, why it is important for the organization, and what is expected from them to sustain improvements. Veolia Water recommends supporting the implementation of the initiatives by putting into place a comprehensive performance-management system, investing in capability building, and communicating at all levels. These are the three key enablers that will ensure a successful implementation:

- **Performance Management –** starting with the definition of measurable targets and assignment of accountabilities at all levels for achieving them.
- **Mindsets and Capabilities –** providing training to equip supervisors and employees with the tools and knowledge needed to manage change and ultimately be more effective in their jobs.
- **Communication –** communicating the vision for the future state and the ongoing efforts at all levels in the overall change-management program.

Experience shows that when these three key enablers work together, improvements happen and are sustained. A successful change management approach will allow the Washington Aqueduct to constantly progress and embrace

Creating sustainable improvement requires a comprehensive approach



future challenges, setting the path to world-class excellence.

H. Governance

Veolia Water's review also included a high-level assessment of the Washington Aqueduct's governance structure and synergies. Due to the operational scope of the study, the various options for alternative governance models have not been analyzed or assessed individually, as the savings and performance improvement opportunities under different models are not expected to materially differ from an operational perspective. For purposes of this review, alternative governance scenarios were assumed to take the form of highly collaborative partnerships, similar to the Blue Plains regional agreement.

The path forward – Implementation plan

This report, summarizing the work of Phase 1, has clearly identified the potential for the Aqueduct to improve core operations—by taking a utility with areas of strong performance to the status of a world-class operation. The implemented recommendations will help the Aqueduct reach its goal of "Achieving Excellence from Source to Tap." Veolia Water is confident that this program has the potential to transform how the Aqueduct operates to deliver some cost savings to its wholesale customers, while improving the level of quality.

Phase 2, Implementation

Achieving the Aqueduct's full potential, in both operational performance and financial savings, will not be easy. To provide the greatest chance of success and keep the momentum, the implementation of these initiatives (Phase 2) must be embraced as a holistic performance transformation across the entire organization, and the Aqueduct will need to devote resources to this effort. As with the initial review, the success factors in Phase 2 are strong decision-making, teamwork with the best Aqueduct resources and personnel, and collaboration among the Aqueduct, the USACE, and the wholesale customers. In the final section of this report, Veolia Water outlines a schedule for implementation and the key milestones and next steps needed to start delivering the benefits of these improvements to the residents of DC, Arlington County and the City of Falls Church.

SUMMARY OF RECOMMENDATIONS AND POTENTIAL SAVINGS		
Focus Area	Recommended Initiatives	**Maximum Savings Potential Identified**
Water treatment and quality	A1. Minimize chemical dosing	$1.1M
	A2. Reduce filter backwash volumes	
	A3. Optimize water quality from source to tap	
Operations	B1. Assess staffing needs in treatment plant operations	$0.6M
	B2. Reduce energy use for pumping	
	B3. Optimize RPF operations	
	B4. Sustain lab productivity/efficiency while improving some of the processes	
	B5. Use tools for best-in-class operations and compliance	
	B6. Optimize fleet use	
	B7. Replace inaccurate flow meters	
Maintenance	C1. Refocus maintenance efforts to what is most important	$2.6M
	C2. Increase maintenance shop productivity with planning and scheduling	
	C3. Change the maintenance organization to best meet needs	
Support functions	D1. Procure goods and services in the most cost-effective manner available	$0.8M
	D2. Implement best-in-class Health & Safety program	
	D3. Improve collaboration and forecasting in HR	
	D4. Continue to provide a suitable level of IT service	
Financial assessment	E1. Financial controls	N/A
	E2. Financial position	
	E3. Rates, revenues and forward pricing	
	E4. Asset Valuation	
	E5. Potential revenue exposure	
	E6. Other revenue impact	
	E7. Liabilities, obligations and major contracts	
Capital planning	F1. Optimize R&R spend using asset value and condition	$2.5–6.5M (CAPEX) $0.4M (OPEX)
	F2. Use tools to develop and prioritize projects in the CIP	
	F3. Implement a performance management system to monitor and improve capital planning process performance	
	F4. Align the organization with capital planning process	
Enablers	G1. Implement a comprehensive performance management system	N/A
	G2. Develop mindsets and capabilities	
	G3. Communicate efforts at all levels in the overall change management program	
Governance	H1. Review alternative governance scenarios that can lead to greater collaboration with wholesale customers	N/A
	Total (OPEX and CAPEX) Yearly Savings	**$8.0–12.0M**

$8.0–12.0M
annual OPEX and CAPEX expenditure reduction potential

VEOLIA WATER

Peer Performance Solutions
David Alexandre, Vice President
david.alexandre@veoliawaterna.com
Tel.: +1 917 544 6775

http://www.veoliawaterna.com/municipal/peer-performance-solutions/

Veolia operated Water Treatment Facilities
- Tampa Bay Water, Florida

VEOLIA

Attachment 7-5

Veolia North America Sustainability Report 2018

VEOLIA

Resourcing the world

Veolia North America

SUSTAINABILITY REPORT 2018

Veolia North America

WELCOME

A Sense of Responsibility to Our Customers and the World

At Veolia North America, we share a strong sense of responsibility to meet the needs of our customers by delivering environmental, social and economic value.

As the world's largest environmental solutions company, these priorities can be optimized together, recovering resources and making the most of them to maximize economic efficiency and growth. This formula uniquely positions us as a leader in the world's emerging circular economy.

In these pages, you will see first-hand how our unique problem-solving and technical expertise help enable resource recovery and solutions in water, waste and energy. We have been leading this effort for decades, both across North America and the world, putting us at the forefront of enhancing customer value through sustainability.

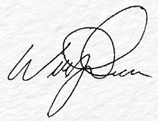
Our sense of responsibility extends to cities and industries across the continent, whether it's reducing emissions through combined heat and power, or reclaiming and reusing solvents through industrial regeneration.

By working toward a circular economy across all our activities in the beneficial recycling and reusing of complex waste streams, we make the world a cleaner and more resilient place.

I would like to thank all of our customers and the communities in which we operate for their support and partnership in helping us achieve these goals.

Bill DiCroce
President and CEO

Sincerely,



BY THE NUMBERS

7,400 employees

$2.3 billion revenue

Manage **1.6 billion** gallons per day of wastewater

2,102,105 tons CO_2 reduced since 2015

11 OSHA VPP star certified sites

800 million gallons per day of water treatment capacity

Support **60 percent** of large refineries in the U.S.

OUR KEY PERFORMANCE INDICATORS

OUR **SAFETY** GUARANTEE

SUSTAINABLE MANAGEMENT OF **RESOURCES**

FOCUSING ON THE FUTURE

DEDICATION TO OUR COMMUNITIES

COMMITMENT TO THE CIRCULAR ECONOMY

HISTORY

Founded over **160** years ago, Veolia is an integral force in protecting the Earth's most precious resources.

OUR SAFETY GUARANTEE

PUTTING SAFETY FIRST

Veolia's Regeneration Services division is leading the way in Veolia's mission to drive a safer industry.

The division's rigorous safety program gives managers and employees at each of the company's regeneration plants the resources and flexibility to ensure the highest safety standards are being met. The core elements of the program center around strict auditing metrics and positive reinforcement which encourages and recognizes employees for contributing to a safe environment.

Our six sites have accumulated more than

11,000

safe days for employees

Plant managers at each of the sites regularly schedule safety meetings in which employees review their processes and analyze their success. In order to prevent minor accidents from becoming significant incidents, employees are given stop-work authority to immediately shut down operations if they identify a hazard or witness an accident taking place.

Employees regularly celebrate safety milestones with lunches and giveaways, while any incidents — no matter how minor — are shared with all locations to provide education on how to keep them from occurring again.

Our safety concerns do not end with our own employees either. We also provide a variety of training programs that cover sulfuric acid safety, distribution and emergency response. These programs educate end-users, first responders and carriers in how to safely store, use and handle their products. Stringent safety training and continual vigilance helps protect both Veolia's employees and the communities around them.

GOING ABOVE AND BEYOND FOR SAFETY

INTERVIEW:

John Dyer
Health and Safety Director
ESS

Veolia North America's Health and Safety Director John Dyer received the Occupational Safety and Health Administration's Voluntary Protection Programs Participants' Association (VPPPA) Outreach Award in 2018. Over the past 10 years, John has led the campaign for Veolia North America's Environmental Solutions and Services (ESS) business to achieve Voluntary Protection Program status at locations across the United States and Puerto Rico.

Why did you choose a career in health and safety?

Fifteen years ago the environmental health and safety position became available at Veolia and I interviewed for the role. I've trained and guided many employees since then and haven't looked back. I love hearing an employee tell me that while at home they applied a work safety training and used the proper tools to complete the task.

What has been the greatest challenge?

This role requires me to not only concentrate on my own health and safety but also the health and safety of more than 130 employees. In addition, I'm also focused on preventing or assisting with potential environmental and transportation incidents.

Being in the EHS manager role for more than a decade has challenged me to find a way to make safety training fun, interactive and personal while designing new ways to train both new and senior employees.

What is your most recent accomplishment?

In 2018 I had the honor of receiving two awards - the National VPP Outreach Award and the VPPPA Region III Mentor of the Year Award.

I mentored 125 employees across six Veolia ESS sites through the use of the Veolia VPP Gap Analysis program which helps identify areas of safety improvement in alignment with VPP qualifications. The program also encourages employees to share ideas and lessons learned from previous VPP sites and applying them to new sites working toward the certification.

While I accepted these awards, these achievements represent Veolia's commitment to safety!

John Dyer receives the VPPPA Outreach Award

SUSTAINABLE MANAGEMENT OF RESOURCES

TURNING BIOSOLIDS INTO NATURAL FERTILIZER

Fifteen years ago, the biosolids in Toronto's wastewater were incinerated and sent to landfill. But in 2001, the city decided to use its wastewater to provide a sustainable product for the local agricultural market.

The result was Nutri-Pel, a biosolids-based commercial fertilizer which contains nutrients and organic matter that improves the physical condition of soil.

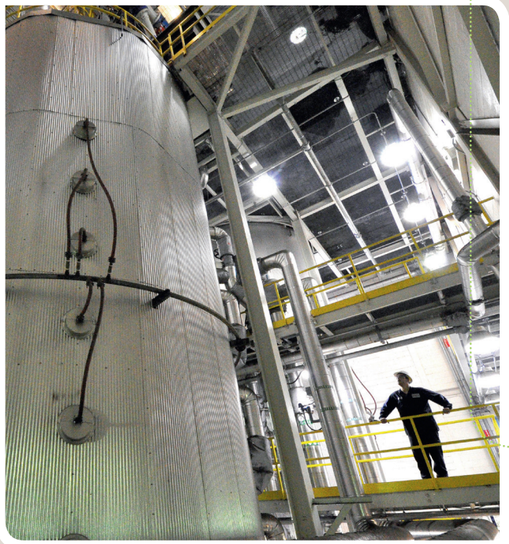
Distributed as pellets, Nutri-Pel holds water and nutrients, resulting in improved yield and growth characteristics for local farmers.

To create it, Veolia operates and maintains the city's pelletizer plant, taking 50 percent of the Ashbridges Bay Wastewater Treatment Plant biosolids and treating them to provide some 25,000 tons of fertilizer a year.

The pelletizer plant replaces a lengthy process that previously produced dried biosolids through the use of open-air drying beds.

With Veolia's help, the facility now operates within a completely enclosed building, equipped with state-of-the-art controls that prevent the release of odors and reduce reliance on drying beds along a local expressway.

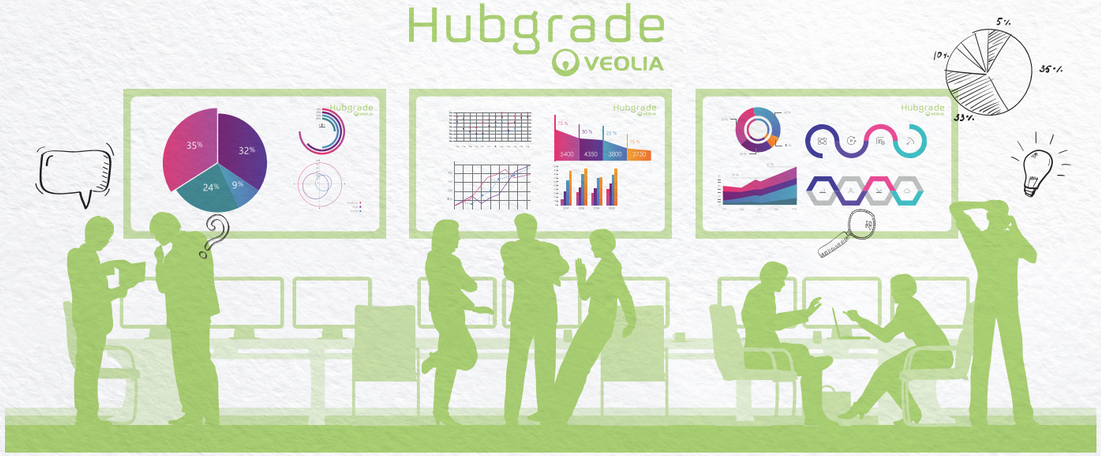
The plant incorporates the latest advances in thermal technology, employing an indirect drying system that gently heats the biosolids, removes water and destroys harmful bacteria and pathogens. In addition to being used in Nutri-Pel, the biosolids are also used in other land and mining applications, with 98 percent of it repurposed for beneficial reuse.



THE BENEFITS OF NATURALLY OCCURRING, ORGANIC FERTILIZERS

- Slow-release of naturally occurring nutrients ensures evenly grown, green grass and healthy soil and plants
- Nutrients available during the growing season when plants need it most
- Effective, yet economical solution compared to chemical fertilizers
- Sustainable solution uses biodegradable, organic product from wastewater treatment process
- Recycling natural nutrients for fertilizer use reduces waste and recovers value from wastewater treatment process
- The number of trucks on the road that were hauling sludge was four times bigger than now since one Nutri-Pel load equals four truckloads of sludge, thus reducing our environmental footprint even more.

SMART SOLUTIONS FOR ENERGY CUSTOMERS



In an age where technology, data and advanced analytics are transforming every sector of the economy, Veolia provides smart business solutions for its energy customers. Veolia's Hubgrade facilities serve as monitoring and analytics centers to improve performance and resource management for hundreds of clients across North America.

Hubgrade is Veolia's concept to improve resource efficiency, combining real-time monitoring and remote management with on-site technician deployment. The goal is to help clients move toward a circular economy by measuring, analyzing and optimizing water, energy and material flows in real time.

Veolia now has over 20 Hubgrade centers around the world, including three in North America (Boston, San Francisco and Baltimore) that provide a broad range of solutions for large-scale building portfolios and campuses.

Building owners and managers are receiving the quality data, technology flexibility and actionable data analysis they need to maximize efficiency and conserve resources. This is achieved by using innovative technology, including advanced metering technology, sensors and smart building software platforms.

Through this comprehensive optimization, Veolia is helping reduce the consumption of precious resources.

15,000 tons

of CO_2 emissions savings in 2018 by optimizing energy services for buildings.

SUSTAINABLE MANAGEMENT OF RESOURCES

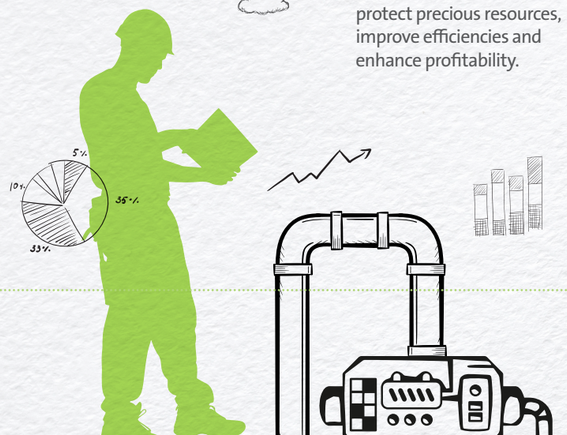
OPERATOR PRIORITIES PROGRAM

Veolia North America is committed to its operational excellence program and recently launched the Operator Priorities Program to engage its sites at the local level. The program links the company's global sustainability targets to the day-to-day work of their operators.

With 133 sites participating in 2018, the program identifies areas of efficiency or optimization within the operations of each site. Plans are then evaluated, tracked and updated regularly to ensure viability, execution and a performance-driven culture.

In one instance, Veolia's Kneeland energy plant in Boston improved its efficiency by capturing cooling water to drive the plant's air compressors. Rather than releasing water to a sewer, they installed additional piping which redirected spent water back to the boilers to be reused in the makeup water of the system.

By determining actionable goals, and measuring data and performance, Veolia multiplies its successes — like the Kneeland facility's — to save its clients more water, protect precious resources, improve efficiencies and enhance profitability.



PRODUCT STEWARDSHIP AT VEOLIA

Making sure Veolia's products and services have a minimal impact on the environment is deeply important to Veolia North America. We are able to transform waste into reusable material, helping our customers work towards a circular economy.

Solvent Recycling with Corteva

Organizations and industries generate solvents that can either be disposed of as waste or recycled into a usable resource. Using recycled solvents supports a circular economy approach and has environmental advantages. Carbon emissions are avoided, water usage is decreased and reliance on a finite supply of natural resources is reduced.

A leader in manufacturing and materials technology, Corteva has taken a leading role in supporting the development and implementation of the circular economy by converting items formerly thought of as "waste" into new products.

Located in Pittsburg, California, Corteva works closely with Veolia in recycling the site's solvents through chemical reclamation. Through a proprietary process, Veolia has successfully treated the solvent and met the chemical specification to resell the material for reuse, resulting in the return of 7.2 million pounds of solvent otherwise destined for incineration.

Lamp Recycling in Pickering, Ontario

In November of 2018, Veolia's Ontario recycling facility celebrated the completion of its first year in operation. The state-of-the-art facility processed 3,750,000 mercury-containing light bulbs since opening, equivalent to 1,200,000 pounds.

Veolia Pickering's equipment crushes and separates expired mercury-bearing light bulbs like compact fluorescents into several components such as metal, glass, phosphorus powder and mercury. Ninety-nine percent of the glass and metal wastes are recycled locally by Veolia. The mercury-bearing phosphorus powder is transported to Veolia's Port Washington, Wisconsin, facility for recycling.

In addition, Veolia serves the lamp recycling needs of Ontario by being an approved processor for the Recycling Council of Ontario's Take Back the Light program.

Glass:
1,110,430
pounds

Phosphorus powder:
28,959
pounds

Aluminum:
20,528
pounds

Mercury:
292
pounds

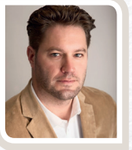
FOCUSING ON THE FUTURE

LEADERS OF TOMORROW

INTERVIEW:

Veolia Environmental Solutions and Services (ESS) President and COO, Bob Cappadona; Project Lead Peter Kavanaugh; and Health, Safety and Security Manager Michelle Helm discuss the company's development program, Leaders of Tomorrow

Bob Cappadona
President and COO
ESS



Peter Kavanaugh
Project Lead
ESS

Michelle Helm
Health, Safety and Security Manager
Municipal & Commercial

What is the Leaders of Tomorrow program?

Bob Cappadona: Leaders of Tomorrow is an innovative development program for Veolia's future leaders. Participants identify ways to improve business efficiencies and focus on applying their skills to a Veolia project. Around 15 employees, like Peter and Michelle, express a strong interest in learning the business, excelling in their area of expertise or developing specific leadership skills.

Senior leadership members, such as myself, review the employees put forward by managers across the company and decide on the participants for that year. Then, we pair each participant with an external coach and an internal mentor.

What is your area of expertise at Veolia?

Michelle Helm: I'm the Health, Safety and Security Manager for our Municipal & Commercial line of business in Milwaukee, Wisconsin. This includes supporting 200+ employees in conjunction with our clients' 100+ contractors.

Peter Kavanaugh: I serve as Project Lead for ESS's Northeast region and provide project management direction to key clients. I oversee all aspects of a project including setting deadlines, assigning tasks and completing projects on time, within budget and within scope.

Describe your LOT project

Michelle: My project focused on creating awareness internally and externally around diversity and inclusion at Veolia. I wanted to establish our company as a leader in the community that supports a diverse and inclusive culture.

Peter: I wanted to improve safety through communicating a tangible message. Safety is paramount at Veolia and core to our business. I created a key chain for employees across the Northeast region that served as a token for us all to complete our jobs safely so we could make it home to our loved ones. We've also established a daily safety reminder across the district.

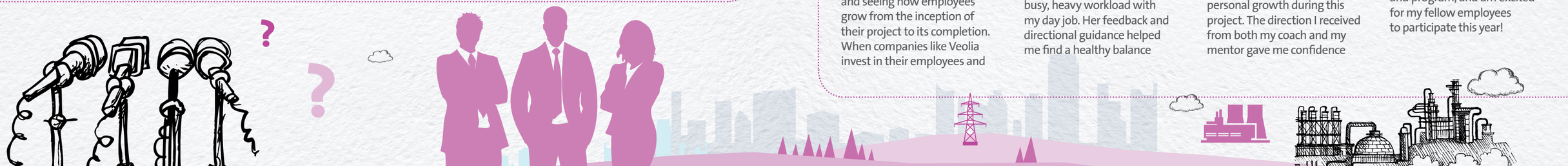
Veolia North America is also invested in the future development of students in the communities in which we operate. In 2018, we hosted over 100 girls and young women for International Women's Day events in North American cities to learn from and interact with female role models across Veolia. Students listened to employees chat about their career journeys and being female in a science, technology, engineering and mathematics-based industry.

How have you benefited from LOT?

Bob: Being a senior leadership team member, I enjoy being involved in the selection process and seeing how employees grow from the inception of their project to its completion. When companies like Veolia invest in their employees and support their development, the business improves drastically.

Michelle: My coach held me accountable for my project, especially while having a busy, heavy workload with my day job. Her feedback and directional guidance helped me find a healthy balance between my project and day-to-day responsibilities which is important to do as a leader.

Peter: I definitely learned more about myself and noticed personal growth during this project. The direction I received from both my coach and my mentor gave me confidence to express to a wider audience the importance of safety to coworkers as well as family and friends. I'm grateful that I was a part of this experience and program, and am excited for my fellow employees to participate this year!



DEDICATION TO OUR COMMUNITIES

VEOLIA'S COMMITMENT TO PUERTO RICO

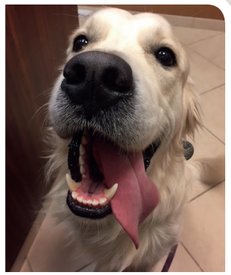
Patrick Meyers
Director, Business Development

When Hurricane Maria descended on Puerto Rico in 2017, it took an enormous toll in terms of human suffering and economic devastation. By the time the storm cleared, it had flattened the island's energy and business infrastructure, with losses estimated at more than $160 billion.

Over 8,000 businesses were unable to recover from damaged facilities and prolonged outages, contributing to a staggering eight percent drop in the island's gross domestic product output.

One of Veolia's top business development leaders, Patrick Meyers, conducted extensive tours of the island and identified areas where the recovery efforts could lead to a more resilient energy infrastructure. Patrick worked closely with government and business leaders to learn from Maria and find ways to limit the damage when the next storm strikes.

He became so committed to the effort that he moved to Puerto Rico along with his wife and their two golden retrievers.



This is Odie, one of Patrick Meyers two Golden Retrievers, who travelled to Puerto Rico with him and his family

A woman walks among the wreckage caused by Hurricane Maria on a street in Puerto Rico

Veolia's plan to be a long-term partner on the island for microgrid solutions not only includes supplying and installing equipment but also operating and maintaining this equipment for the next 20 to 30 years. We are dedicated to developing sustainable, reliable and affordable energy solutions for Puerto Rico.

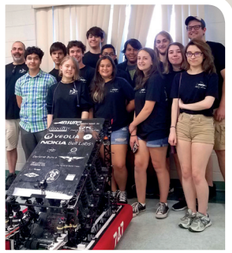
Chief among the company's solutions is microgrid technology which offers energy independence by creating a contained power grid that can provide electricity when the larger national grid fails. Microgrids have proven to be effective for critical institutions such as hospitals or utilities in times of emergency, allowing them to continue operating amid widespread outages.

In response to Maria, many businesses in Puerto Rico, especially within the island's manufacturing sector, have decided to pursue this technology. Patrick and Veolia are working diligently with Puerto Rico in making the island more resilient.

INDUSTRY AND NEIGHBORS JOIN FORCES

Beginning in the late nineties, a local company created the Middlesex Community Advisory Panel (CAP) but disbanded in the 2000s.

When Veolia acquired Middlesex, New Jersey, company Marisol in 2015, there was an important question on Facility Manager Mike Pikulin's mind – how can we build a new relationship with this community? Mike decided to reignite the CAP program.



Local high school robotics team, Flight Crew 747, showcases the robot they built

Why a CAP? A CAP effectively improves communication and understanding between industry and the communities in which they operate. In the 1980's, the Chemical Manufacturers Association, now the American Chemistry Council, developed the concept of a CAP as part of its initiative, Responsible Care®.

Former Middlsex Recycling Coordinator John Sweeney has been involved with the Middlesex CAP for more than 20 years.

"The mere fact that there's still a CAP after nearly three decades highlights the value Veolia puts on its relationships with its communities. CAPs serve as an opportunity for a two-way dialogue where businesses, residents and community officials can swap information and brainstorm ideas."

Veolia Middlesex CAP members

Former Middlesex Councilman Bob Schueler echoed these sentiments.

"Being a resident myself, I'm never far away from what's going on in the town. The CAP helps us learn more about Veolia and neighboring industrial businesses. Mike and his team have always emphasized safety protocol and transparency. We appreciate the opportunity to have a conversation and relationship with the industrial area."

But the CAP is also a platform for other community members to discuss their projects, not just Veolia or industrial businesses, as Mike explains.

"We employ more than 50 local residents at our facility so we like to be involved in as much of the community as we can. This includes having our local police and fire departments share program updates or having the nearby high school robotics team, Flight Crew 747, perform a demonstration.

The students share the latest robot they've built, developing their science, technology, engineering and mathematics skills. Veolia is more than just a logo, we are a partner and the CAP supports that message."

COMMITMENT TO THE CIRCULAR ECONOMY

GROUNDBREAKING VEOLIA TECHNOLOGY SUPPORTS WATER STEWARDSHIP IN CALIFORNIA

Water is trapped in the same formations as oil and gas. During the production phase, the commingled oil, gas and water is brought to the surface.

The water component, also known as "produced water," contains impurities even after it has been separated from the hydrocarbons, a compound of hydrogen and carbon.

The management of produced water can become a problem for oil driller operators, the surrounding community and the local ecology.

There are solutions, including:

- **Treating and returning water to the oil production process**
- **Injecting into wells — a limited and highly regulated solution**
- **Cleaning and releasing to the surface or into a body of water**

If excess produced water isn't managed, it can overwhelm an oil drilling operation and cause adverse impacts to the surrounding environment.

That's why one oil producer in Southern California contacted Veolia.

As a global company, Chevron understands that access to water is essential for communities where the company operates and for the business. Chevron has implemented management systems, processes and standards to manage this critical natural resource.

In fact, the company treated and recycled over two million cubic meters of produced water at its Permian and Delaware Basin operations. In 2018, Chevron also recycled or reused 98 percent of produced water generated by operations in the Appalachian region.

When Chevron's San Ardo, California, oil field began extracting more than 10,000 barrels of heavy oil each day, the company engaged Veolia's experts in water treatment technology, engineering and operations to sustainably treat the produced water, helping to preserve and reuse it.

This allows for more water to be circulated back into the production process, reducing overall water consumption, maximizing efficiency and minimizing environmental impact.

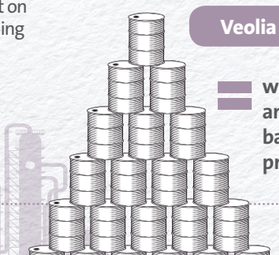
Veolia's innovative application of its OPUS® technology — groundbreaking for produced water management — has delivered exceptional value to Chevron. Veolia developed a sustainable solution that allows up to 50,000 barrels per day of produced water to be discharged to the surface and another 75,000 barrels per day to recycle back into oil production.

By avoiding deep well injection, Chevron has a long-term solution for managing produced water that limits its regulatory risk and supports water stewardship. Veolia is helping Chevron minimize its environmental impact on water-stressed California by returning water to the aquifers.

125,000
barrels of oilfield produced water a day +

Veolia OPUS® technology

= water for wetlands and water recycled back into the oil production process



SUSTAINABLE OIL REGENERATION FOR THE FUTURE

For 30 years, Veolia has collected and recycled contaminated oils, oil filters and oily plastics in Quebec from various industries. Until 2013, the materials went to cement plants that reused the recycled materials in their production processes.

Nathalie Viens
Senior Vice President
Canada East

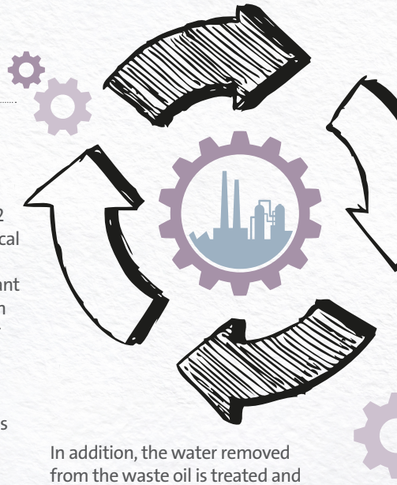
"Veolia is a leader in Quebec in the oil regeneration market. Our first and only oil regeneration plant is a solid example of a circular economy, developing the economy while making sure that it is done in a sustainable way for the environment."

Fifty-five million dollars and 32 new highly skilled petrochemical jobs later, Quebec now has its first waste oil regeneration plant from Veolia. With a production capacity of 72 million liters per year, and a storage space of 10 million liters of used oil and 3.5 million liters of finished products, the center opened its doors in 2013.

Veolia works in partnership with refineries, manufacturers and distributors of lubricants to create a dynamic and unique circular economy in Eastern Canada.

After extracting their waste, the recovered oils are transformed via a distillation process into the following three distinct hydrocarbons:

- **Second generation virgin oil, called vacuum gas oil, is sold on the commodity market and to refineries**
- **Asphalt goes to a nearby company in Montreal**
- **Light vacuum gas oil, goes to a company that produces, distributes and stores heavy fuel oil, bitumen and crude oil**



In addition, the water removed from the waste oil is treated and purified then sent to the city's sewer, and five percent of the gasoline is used on-site as fuel for the thermal oxidizer.

Veolia also recuperates plastic material which is then sent to a recycler.

Additionally, while the worn oil is regenerated to produce base oil that is blended with new additives and used once again as a lubricant, filters are taken care of, too. Hefty presses compact the filters, collecting the oil that's left in them — roughly 33 percent of their weight — and leaving nothing at the end of the process but 100 to 125 filter batches turned into 57-kilogram bricks of steel that can be melted and reused.

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