

Agenda

Wet Weather Team
Stakeholder Group Agenda
December 10, 2019
5:30 p.m. – 8:00 p.m.

- 5:15 Dinner served
- 5:30 – 5:45 Welcome & Intro, Ground Rules, Purpose
Clay Kelly, Strand Associates
- 5:45 – 6:15 State of MSD, Blueprint 2025
Tony Parrott, MSD Executive Director
- 6:15 – 6:35 Customer Awareness Survey Results
Stephanie Laughlin, MSD Infrastructure Planning Program Manager
- 6:35 – 6:50 IOAP Update
John Loechle, MSD Engineering Technical Services Director
- 6:50 – 7:20 Infrastructure Risks
Brian Bingham, MSD Chief of Operations
Angela Akridge, MSD Chief Strategy Officer/Chief Engineer
- 7:20 – 7:45 Observer Comments, Wrap-up and Adjourn
Clay Kelly

Meeting Summary
Wet Weather Team Stakeholder Group Meeting
December 10, 2019
MSD Main Office, Louisville

The Wet Weather Team (WWT) Stakeholders, chartered by the Louisville and Jefferson County Metropolitan Sewer District (MSD), met on December 10, 2019, at MSD's main office. The objectives of the meeting were to:

- Provide a Consent Decree Integrated Overflow Abatement Plan (IOAP) and general MSD update,
- Review the results of the recent Customer Awareness Survey, and
- Discuss the current risks facing MSD's infrastructure.

Welcome

Clay Kelly of Strand Associates opened the meeting by welcoming everyone and congratulating Kurt Mason on his upcoming retirement. Clay explained to the stakeholders that MSD is focusing on issues in addition to stormwater and values the stormwater-focused input from the WWT.

MSD Update

Tony Parrott, MSD Executive Director, described potential regionalization opportunities for MSD, including acquisition of Oldham County's sewer system. Tony noted that the Commonwealth is very supportive of these efforts and often refers other communities to MSD as a resource. Tony stressed that no county or utility will subsidize the other. Each will be run as its own business enterprise.

A stakeholder asked whether MSD was going to be taking over responsibility for stormwater in Oldham County. Tony said that MSD would just be assuming wastewater unless asked to consider stormwater at some time in the future.

Another stakeholder asked whether there would be different rates for different locations. Tony explained that rates will vary from county to county, utility to utility, based on factors such as existing debt, capital improvement needs, and operational costs. Tony added that MSD is looking to stabilize or reduce rates wherever possible. For example, in Oldham County there will be an initial fee reduction followed by a period where the rates will eventually equalize with those in Jefferson County.

A stakeholder asked whether the Kentucky State Reformatory (KSR) was on its own wastewater system. Brian Bingham, MSD Chief of Operations, answered that KSR owns its own system and Oldham County operates it as a lease, which MSD will take over. Brian expanded his response by adding that the system is mostly operated by inmates who are then able to be licensed and find meaningful employment in the clean water profession after release. Tony added that MSD is exploring an option to eliminate the system at the women's prison in Shelby County by constructing a sewer interceptor to the site.

A stakeholder asked Tony to expand on what was included when he said MSD has "acquired" a system. Tony explained that MSD would own all the assets and debts and would be responsible for the management and operation of the system. It was a complete transfer.

One stakeholder asked whether any of the systems MSD is acquiring have Consent Decrees. Tony replied that yes, some do. They are more likely to be Consent Orders and to come from the Commonwealth than the federal government. Tony confirmed that MSD will take responsibility for compliance with them.

Another stakeholder asked whether any of the acquired system have combined sewers. Tony said that none of the other systems have combined sewers.

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Tony then provided an overview of MSD's Innovation Program. He shared that MSD is part of an effort being led by the Water Research Foundation along with 60 other communities to develop innovation in water and wastewater utilities. MSD is one of only three partners that were selected to be part of the demonstration.

Progress is being made and MSD is already realizing benefits. Tony said he would have another, more in-depth update in about six months.

Several stakeholders commended MSD for these efforts and encouraged Tony and staff to continue. One stakeholder asked whether there were key barriers that contribute to some employees of MSD thinking that it is not innovative or there is no room for innovation. Tony explained that lots of people have a variety of different definitions of what "innovative" means. Some do not see the small things MSD improves everyday as innovative, when they really are. Tony added that MSD needs big and small ideas to develop new revenues and manage costs.

Blueprint 2025

Tony introduced MSD's new strategic business plan called "Blueprint 2025" by announcing that Angela Akridge, MSD Chief Engineer, had been named Chief Strategy Officer and would be leading the development and implementation of Blueprint 2025. Additionally, Angela would continue leading regulatory compliance efforts for the organization.

A short video on the structure and contents of Blueprint 2025 was shown. This video has been used in internal training and external communication to explain the plan.

A stakeholder asked how MSD plans to expand the values stated in Blueprint 2025 to contractors and other non-MSD employees that work for MSD. John Loechle, MSD Engineering Technical Services Director, said that MSD has and will continue to work on its communication on projects and making sure contractors see MSD values in action. Additionally, adherence to these values will be part of MSD's evaluation process. Tony echoed John's statements and added that contractors that do not meet MSD's values will not be used.

Clay wrapped up the discussion by noting that most of the community does not differentiate between MSD and MSD's contractors.

Customer Awareness Survey Results

Stephanie Laughlin, MSD Infrastructure Planning Program Manager, began this topic by explaining that MSD is surveys the community every two years on the attitudes toward clean waterways, awareness of water pollution issues, willingness to change behaviors, and communication preferences as part of its Consent Decree and MS4 commitments. Stephanie presented several questions from the survey and the WWT was asked to respond. Those responses were not necessarily to be from the Stakeholder's individual perspective but should represent

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how the Stakeholder thinks the community would respond. A comparison between the Stakeholders' responses and the actual results was made and those results are included in the meeting materials with these minutes.

One noteworthy example was a positive change in the number of people who knew how to dispose of wipes, grease, and other materials properly. This and other survey data is provided to communications staff to help inform public outreach as customers demographics change.

A stakeholder asked how the survey was conducted and Stephanie explained that the survey was distributed to current customer email addresses. It was also advertised on social media and MSD and Louisville Water Company websites/announcements.

Another stakeholder asked whether other communities and utilities were required to conduct these surveys and, if so, could they be standardized to allow comparisons across larger areas. Stephanie and Brian said that such surveys are typical for MS4 program outreach, but not prescriptive from the state/region in terms of specific questions.

IOAP Update

John began the IOAP Update by thanking the WWT for creating a foundation and vision to develop projects that can benefit the community in multiple ways. This approach has caught the attention of MSD's peers and is resulting in numerous and prestigious awards for MSD's projects. John summarized MSD's recent awards from various professional organizations for the Southwestern Parkway CSO Basin Project, Clifton Heights CSO Basin Project, Ohio River Interceptor Emergency Repair Project, Real Time Control, and Flood Recovery efforts.

John summarized MSD's progress on completing Consent Decree related projects and clarified that MSD is hoping to minimize or eliminate some of the projects associated with sanitary sewer overflows by repairing leaking sewer pipes. John reminded the WWT that this is a countywide effort with projects throughout MSD's service area. John then highlighted the progress being made by showing a graph of discharges since 2008 and how the number of discharges is dropping despite more rainfall.

John then went through status updates for several ongoing and recently completed projects.

A stakeholder asked when will concrete start being pumped into the Waterway Protection Tunnel. John answered that it should begin around April 2020 and will occur at multiple locations once tunneling was complete. The stakeholder followed-up by asking where does the rock go? John said that is the contractor's responsibility and it goes to several locations.

Another stakeholder asked what the mix on the grout was. John explained that it was a lighter grout meant for provide a smooth, watertight seal and not for structural support.

Because stakeholders have expressed interest in touring the Waterway Protection Tunnel, MSD will continue to determine if and when this is possible. John and Clay explained that safety concerns prevent large groups of people from touring the tunnel while the boring machine is in operation. Once the tunnel is closer to being completed it might be possible to have larger groups and we will continue to explore the possibility of a tour for the WWT Stakeholders.

MSD's Infrastructure Risks

Brian presented a summary of the compounding problems MSD is facing with its wastewater conveyance and collection system, water quality treatment centers (WQTCs), biosolids program, and Ohio River flood protection

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system. He noted that MSD has historically deferred maintenance on the facilities it uses (such as offices and WQTCs) in order to keep facilities that directly serve its customers running. Brian detailed the funding deficit between the cost to do what is needed and what MSD can do with its current revenues.

A stakeholder recognized about a \$500 million difference in what the recent Corps of Engineers study recommended for the flood protection system and what was recommended in MSD's Critical Repair and Reinvestment Plan (CRRP). The stakeholder also asked whether the Corps were ignoring climate change impacts. Brian answered saying that the Corps reviewed historical records while MSD uses future projections. Also, MSD believes the entire community should be protected up to the 100-year storm while the Corps looks back at the original design criteria for the system where some portions of the City are only protected to a 30-year storm. Brian pointed out that even with the difference, Corps funding will help take care of needs with the flood protection system. For example, the Corps can pay for 65 percent of what they recommend, and MSD can pay 100 percent for the additional improvements beyond the Corps recommendations. The stakeholder shared that on another project in the community, the Corps is using climate change projections to drive recommendations. Brian clarified that different groups within the Corps have different missions and guidance.

Stephanie shared with the stakeholders that the Corps' report is available for public review and comment and said she would send it and MSD's comments to the WWT. She did so before the meeting concluded.

Brian added that the Corps has been an excellent partner and complimented them for completing its study expeditiously. Tony added that while MSD may disagree with some of the Corps recommendations, MSD would not walk away from this potentially large source of funding. Tony also acknowledged the role Senator McConnell and his staff had in helping make this study and funding available.

Angela then presented on MSD's strategy to fund the needed improvements to mitigate risks. She highlighted the various avenues MSD is working on for cost-sharing opportunities.

A stakeholder asked whether MSD had stopped its effort to secure a larger than 6.9% annual rate increase. Tony answered that MSD is still trying, but the funding challenges with the City and other issues make it very unlikely. MSD is exploring opportunities to expedite critical projects and increase revenues.

One stakeholder brought up that education was the critical component and that people did not understand how bad things were. Another stakeholder agreed with that statement and added that the general public does not understand the consequences of one of these systems failing. Another stakeholder said that parts of the community are more familiar with these problems than others. For example, the neighborhoods surrounding the Morris Forman WQTC are very much aware of the biosolids issues because they can smell it. Tony agreed and said it will take a lot of people talking about these issues with their neighbors and council members in order to get movement.

A stakeholder expressed that elections have consequences and that people elect leaders. Pushing for more funding by voters will result in changes at the local, state, and federal levels. A stakeholder added that, at least on the national level, the conversations about infrastructure are more focused on a financial number (i.e., funding amount rather than a strategy).

A stakeholder observed that everyone uses roads and sees and understands them. They "get" problems with the roads. But not everyone sees Morris Forman WQTC or knows there is a problem even though it is just as important to the City. Educating the public so that they can advocate for fixing our infrastructure is essential. A different stakeholder added to this comment by saying that most people do not see past their own property line or the roads they drive on and suggested looking into ways to connect everyone to the larger community. Some discussion followed about how to educate people about how dependent they are on clean water infrastructure

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and where it is located. The idea of a “Track Your Flush” app that shows the route from your home to the WQTC to the stream was proposed.

One stakeholder who is engaged with other efforts along the Ohio River remarked that Louisville is not the only community facing these challenges and encouraged MSD to collaborate with other communities. Tony and Brian responded by saying they communicate with their peers in the region regularly through various conference, professional organizations, and personal relationships.

Another stakeholder expressed fear that residents will not care how these infrastructure issues are affecting the community until the problems directly impact them. It was suggested to tie these issues to larger problems such as waterway pollution to get more people’s attention. Brian agrees but said that MSD’s surveys are showing that more and more people are paying attention and starting to care. The shift is small but growing.

Observer Comments, Wrap-Up, and Adjournment

Clay closed the meeting by wishing everyone safe and happy holidays and thanking the WWT stakeholders for their time and insight.

There were no comments from the observers.

Meeting Materials

- Agenda for the April 8, 2019 WWT Stakeholder Group Meeting
- Copy of the presentation slides:
 - MSD Update
 - Blueprint 2025
 - Customer Awareness Survey
 - IOAP Update
 - Infrastructure Risks

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Meeting Participants

Wet Weather Team Stakeholders (Present)

Steve Barger, Labor (retired)
Stuart Benson, Louisville Metro Council, District 20
Deborah Bilitski, Waterfront Development Corporation
Andrew Condia, Senator Mitch McConnell's Office
Arnita Gadson, West Jefferson County Community Task Force
Corinne Greenberg, Carbide Industries
Kurt Mason, USDA Natural Resources Conservation Service
Jeff O'Brien, Louisville Metro Government, Director of Louisville Forward
Lisa Santos, Irish Hill Neighborhood Association
Tina Ward-Pugh, Louisville Metro Government, Resilience and Community Services, Office for Women
David Wicks, Get Outdoors Kentucky; Jefferson County Public Schools (retired)
Ward Wilson, Kentucky Waterways Alliance

Wet Weather Team Stakeholders (Not Present)

Susan Barto, Mayor of Lyndon
Billy Doelker, Key Homes
Mark French, University of Louisville Speed School of Engineering
Eric Friedlander, Louisville Metro Government, Chief Resilience Office
Tim Fulton, Louisville Metro Government, Superintendent of Parks and Recreation (no longer with Metro and possibly has relocated from Louisville)
David James, Louisville Metro Council, District 6
Rick Johnstone, Deputy Mayor, Louisville Metro Mayor's Office (retired)
Maria Koetter, Louisville Metro Government, Director of Sustainability (no longer with Metro)
Jody Meiman, Louisville Metro Government, Director of EMA/MetroSafe
Rocky Pusateri, Elite Built Homes
Mary Ellen Wiederwohl, Louisville Metro Government, Chief of Louisville Forward
Nicole Yates, Representative John Yarmuth's Office

Wet Weather Team MSD Personnel (Present)

Tony Parrott, MSD Executive Director
Angela Akridge, MSD Chief Engineer/Chief Strategy Officer
Brian Bingham, MSD Chief of Operations
John Loechle, MSD Engineering Technical Services Director

Technical Support

Clay Kelly, Strand Associates
Paul Maron, Strand Associates

Meeting Observers

Sharise Horne, MSD
Stephanie Laughlin, MSD

State of MSD

Wet Weather Team

December 10, 2019



Regionalization Update

December 10, 2019





Enabling Legislation for Regionalization

In 2016, high profile failures of “package” treatment plants led to the passage of Kentucky House Joint Resolution 56, to initiate a study of regionalization opportunities to limit the risk of future failures.

The study that was performed in 2017, as a result of this Joint Resolution, provided an inventory of small “package” facilities and emergency risk mitigation.

Legislative jurisdictional boundaries created a limitation on efforts to regionalize.

For example, Louisville MSD was created by state statute to own assets in Jefferson County, KY (ONLY).





Enabling Legislation for Regionalization

During the 2018 Legislative Session in Kentucky, Senate Bill 151 (SB151) was filed to enable utility ownership of sewer assets outside of jurisdictional boundaries through inter-local agreements.

House Bill 513 (HB513) was filed to require additional insurance, as well as regulatory and financial accountability for small “package” treatment facility operators/builders.

Late in the session, these two bills were combined and passed under HB513, and signed by the Governor on April 25, 2018.





Enabling Legislation for Regionalization

In 2019, Bullitt County Sanitation District and Bullitt County Fiscal Court requested a proposal from MSD for acquisition and regional solutions. This proposal is currently in the due diligence phase.

On the heels of the Crestwood acquisition, Oldham County Environmental Authority and Oldham County Fiscal Court requested MSD to submit a proposal to acquire their system.

The City of Crestwood lobbied for enabling legislation, to allow MSD to acquire their system. This was accomplished in early 2019.

In 2019, a task force was formed to evaluate and make recommendations for regional water and wastewater solutions. This report is to be delivered in December 2019.



There have been other expressions of interest in MSD service, that have not quite reached agreements on proposal development.

Questions?

Innovation Program Update

December 10, 2019



Water Research Foundation

Leading Water/Wastewater Utility Innovation

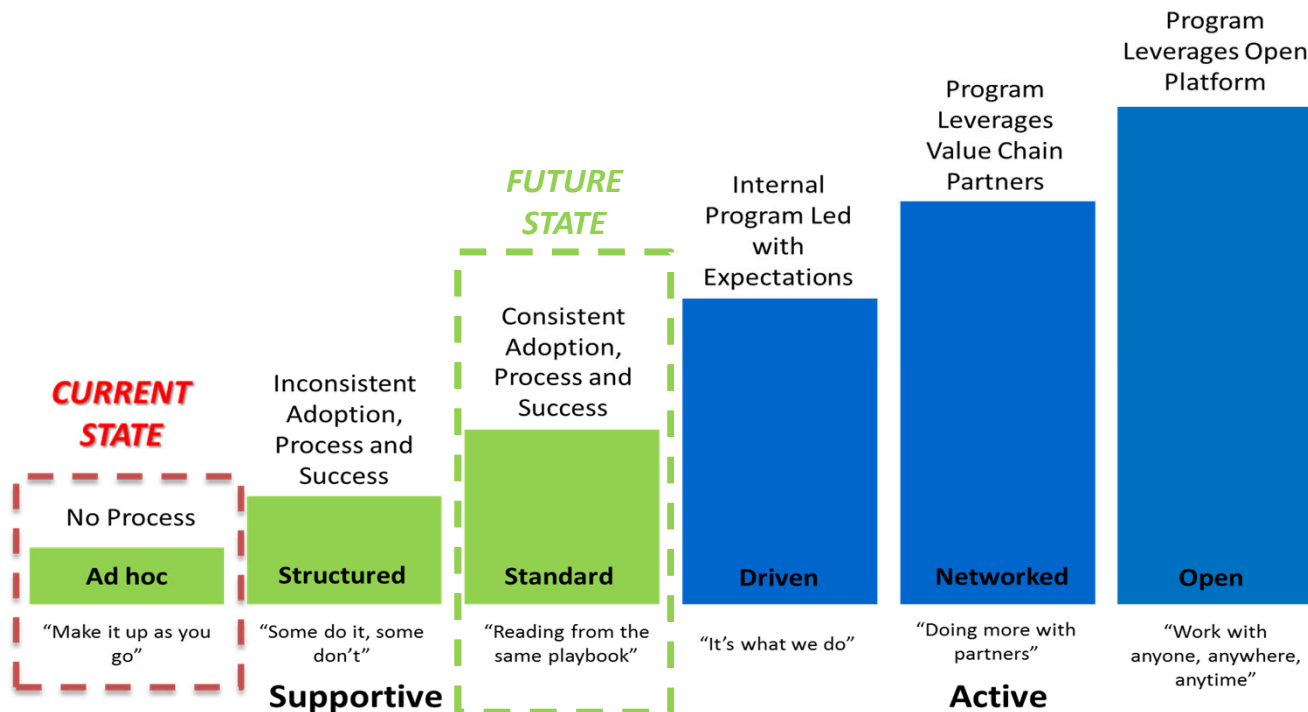
- Workshops
 - #1 April 2019 Innovation Leaders & Engagement
 - #2 July 2019 Leveraging Your Ecosystem to Accelerate Innovation
 - #3 August 2019 Innovation Tool Development
 - # 4 October 2019 Innovation Strategy & Challenge Development
 - # 5 Sprint 2020 Strategy Review and Framework Validation (Louisville MSD)
- Monthly Update Call
- Demonstration Utilities
 - Louisville MSD
 - Great Lakes Water Authority (GLWA)
 - Washington Suburban Sanitary Commission (WSSC)

Innovation Maturity

Innovation Readiness Survey – August 2017

- 91% surveyed believe that innovation is critical to MSDs future.
- 32% believe that MSD is currently effectively embracing innovation.

**Well-recognized
need and
opportunity to
improve innovation
at MSD**



INNOVATION

Innovation Accomplishments

- Innovation aligned with Blueprint 2025
- Innovation team (cross-functional)
- Innovation Steering Committee
- Monthly Executive Director meetings
- Idea management (categories, levels, refinement, prioritization, communication)
- Soft launch
- Engagement tools (logo, tagline, infographic, email, etc.)

Innovationideas@louisvillemad.org

Innovating Together



INNOVATION

Innovation Next Steps

- Workshops to review, develop, and evaluate ideas
- Communication plan
- Appreciation program
- Idea management database
- Confirm evaluation methodology
- Performance measures

Innovating Together



INNOVATION

Questions?

Our Next Strategic Business Plan 2019-2025

December 10, 2019





OUR VISION

The innovative, regional utility for safe, clean waterways.

OUR MISSION

Provide quality wastewater, stormwater and flood protection services to protect public health and safety through sustainable solutions, fiscal stewardship, and strategic partnerships.



Strategic Business Plan 2019-2025

Critical Success Factors

CSF1 - Sustain Quality and Compliant Wastewater, Stormwater, and Flood Protection Services

CSF2 - Earn the Community's Trust Daily as the Leading Provider of Quality Wastewater, Stormwater, and Flood Protection Services

CSF3 - Transform into an Employer of Purpose where Employees are Provided the Opportunity to Thrive

CSF4 - Ensure Financial Stewardship and Sustainability of Community Resources

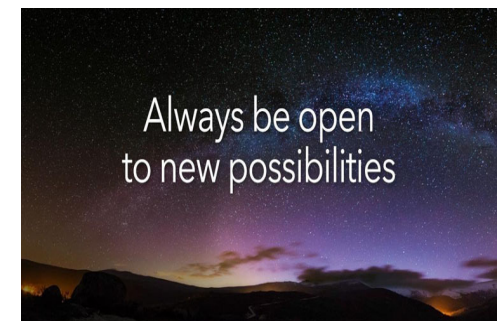
CSF5 - Realize Operational Efficiencies and Revenue Generation Through Strategic Partnerships and Innovation



Values

**“how to conduct ourselves”
when carrying out Blueprint 2025**

- Investing in People
- Focusing on Performance
- Innovating Through Leadership



Values

Investing in People

- **Respect** – where we demonstrate high regard, value and consideration for each other, our customers and the community
- **Excellence** – where we strive for personal excellence, recognize exemplary performance, and seek continuous improvement



Values

Focusing on Performance

- **Customer Focus** – provide value-added service to our internal and external customers
- **Integrity** – we serve with high ethical standards, deliver on commitments and maintain honesty as we advance the greater good to our customers



Values

Innovating Through Leadership

- **Accountability** – where we account for our actions, address challenges promptly, and implement effective solutions
- **Stewardship** – manage the infrastructure, environment and resources entrusted to our care in a responsible and sustainable manner



Vision +
Mission +
Critical Success Factors +
Objectives +
Values

= Blueprint 2025



Questions?

We have a brief video on Blueprint 2025.

Blueprint 2025

[Blueprint 2025](#)

Blueprint 2025



December 10, 2019



Blueprint 2025

[Blueprint 2025 video](#)

MSD's Infrastructure Risks

MSD Wet Weather Team

December 10, 2019



identification plan prioritization
standard
RISK
quality
treatm
im
management event strategy
control

What Should MSD's Infrastructure Concerns Be?



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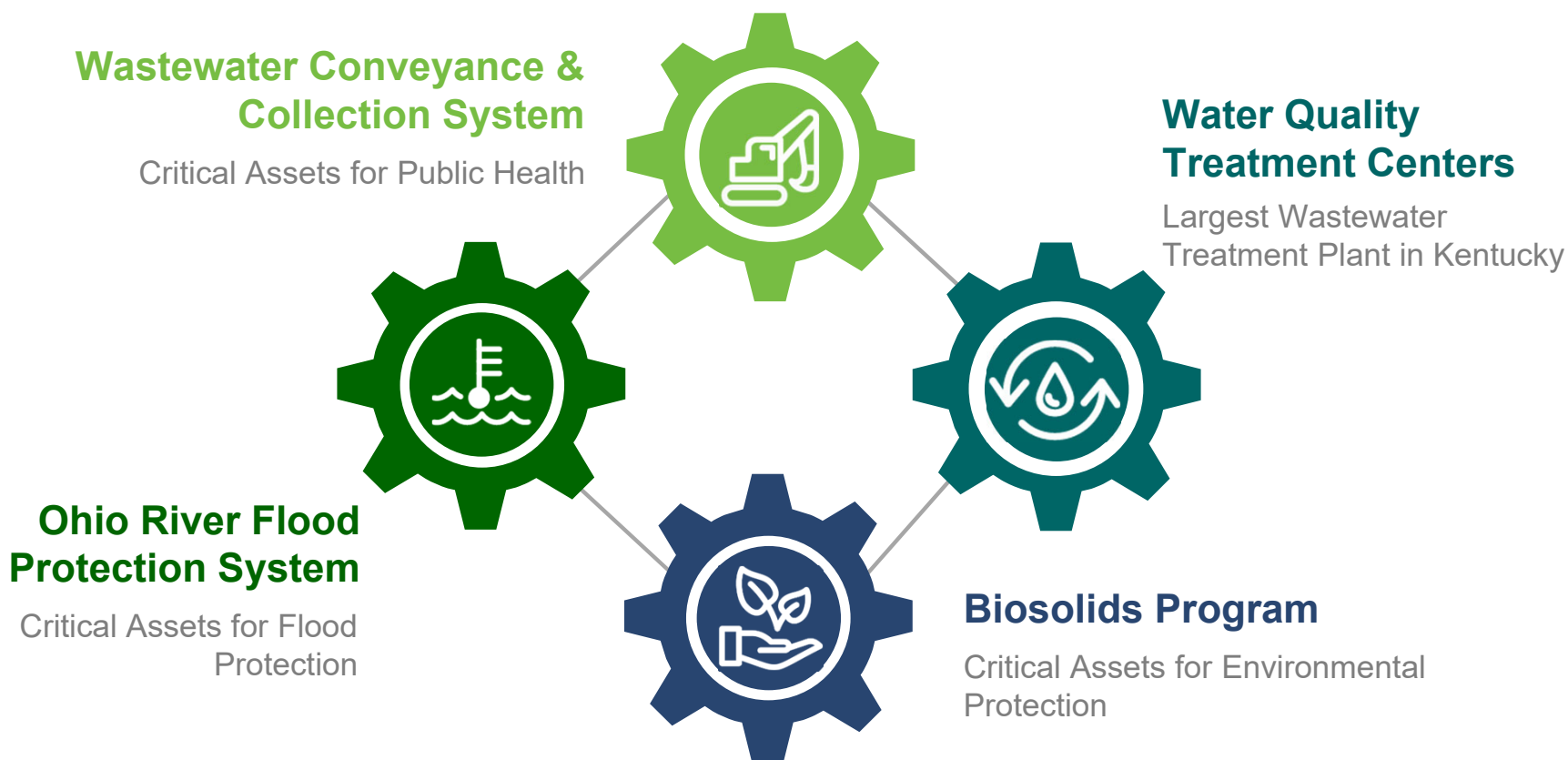


Compounded Problems

12.10.19



MSD's Highest Infrastructure Risks



Wastewater Collection & Conveyance System

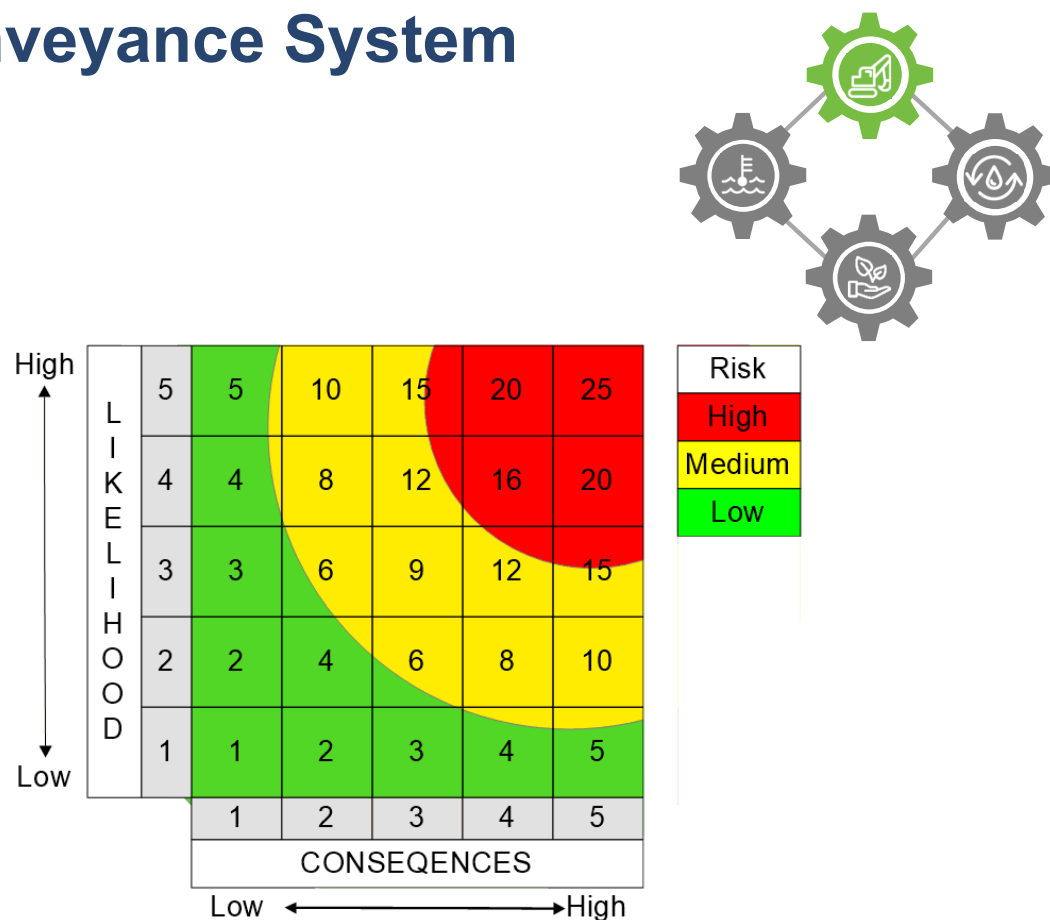
Some sewers are 150 years old

\$2.2B to address all sewer rehab and known structural deficiencies

\$740M for known sewer structural deficiencies

- 600 miles combined sewers
- 2,700 miles sanitary sewers
- 1,400 miles lateral connections to buildings
- 260 wastewater pumping stations

Sewers with high risk scores (20 to 25) have been incorporated into 15-year CIP totaling \$260M



Frequency of Emergency Sewer Repairs is Escalating

Sewer Repair Emergency Project	Cost
Clay Street Repair	\$63,560
29 th & Broadway Repair	\$5,924
1531 W. Broadway Sink Hole Repair	\$16,700
490 E. Witherspoon Street Heavy Cleaning	\$284,364
Main & Hancock Emergency Repair	\$1,172,024
5 th & Main Sewer Repair	\$47,736
East Liberty Street Sewer Repair	\$250,000
Beargrass Creek Sewer Repair	\$130,000
Broadway at Preston Sewer Repair	\$1,167,612
Baxter Avenue at Liberty Street Sewer Repair	\$647,504
Muhammad Ali Blvd at Armory Sewer Repair	\$148,525
Markey Street at Brook Sewer Repair	\$264,127
Ohio River Interceptor Structural Rehab	\$18,321,720
TOTAL	\$22,519,796

Significant major interceptor failure has occurred in the past two years due to severe deterioration of large pipe segments. USEPA noted that MSD had 12 major pipe collapses in a 15-month period.



Morris Forman WQTC Sustainability



Exceeded Useful Life of Systems

\$1B Morris Forman Plant needed for full plant replacement (CRRP)

Aging infrastructure – plant built in 1958

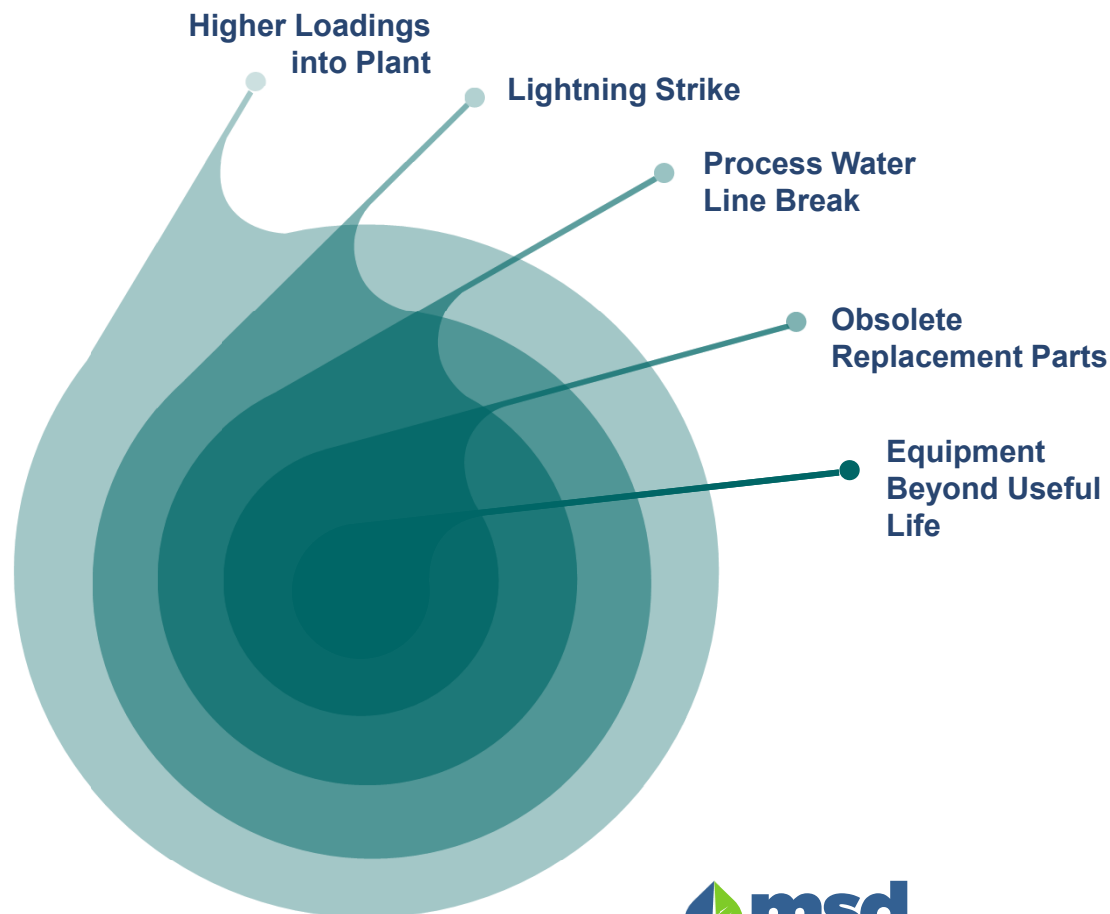
Challenges meeting wet weather peak flow rate, impacting both Consent Decree termination and long-term permit compliance

Continuous challenges to meet MFWQTC permit requirements

During the **2019** Facility Inspection, USEPA noted the condition of the MFWQTC.

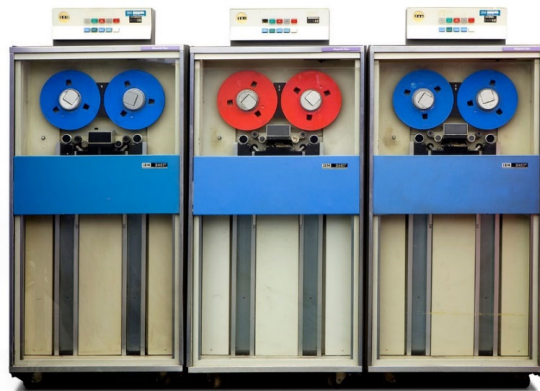
USEPA noted ***significant deterioration of every system*** at the Morris Forman WQTC. While this report suggests that the system is meeting treatment needs, the plant capacity is limited, land locked, and experiencing significant NPDES violations, leaving MSD exposed to regulatory enforcement.

The operational challenges at the Morris Forman Plant have ***compounded*** over the past five years.



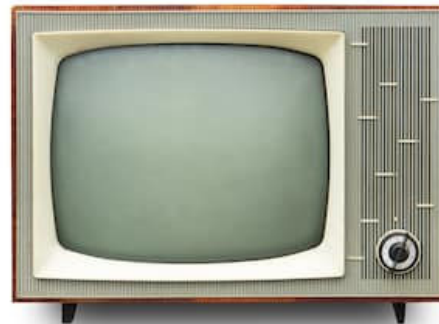
Original Plant Constructed with 1950's & 1970's Technology

1950s



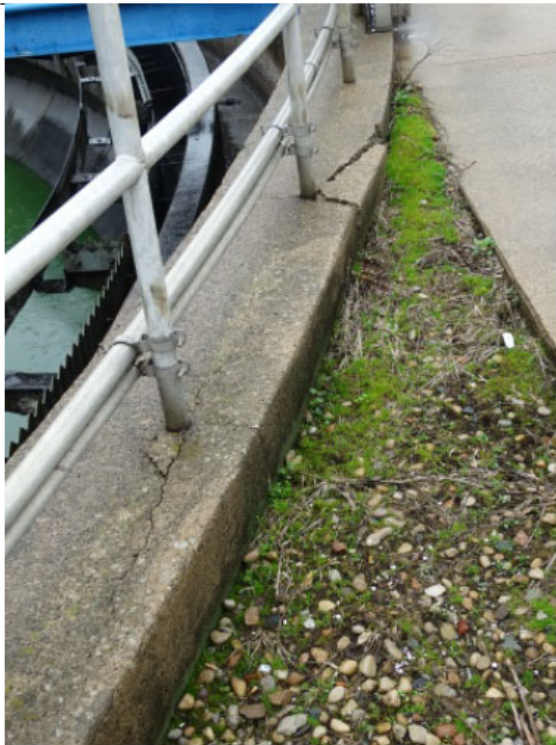
- *Outdated* technology
- Excessive and major wear impacting level of service
- Specialty firms required to refurbish 1950s and 1970s equipment

1970s



- Not same as maintaining older home due to corrosion & constant usage

Morris Forman WQTC Structural Deficiencies



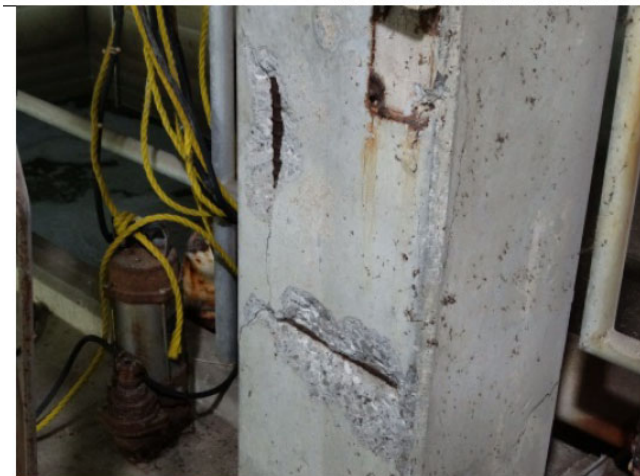
Photos from CRRP documents



FIGURE 6-9
Leaking Expansion Joint



FIGURE 6-3
Cracked Concrete Haunch



Structural support Column with exposed rebar
Safe, clean waterways

Morris Forman WQTC Metal Deterioration



FIGURE 6-2
Corrosion of North Staircase



Photos from CRRP documents

Morris Forman WQTC Roofs Failing



Built-up Roof on South Primary Pump Station



Ponding water with debris approximately $\frac{3}{4}$ inch in thickness.



HPO Reactor "A" Filled cracks (Photo: Google Earth)

Photos from CRRP documents



FIGURE 6-10
Damaged Concrete Roof Panels



FIGURE 6-5
Corrosion on Steel Roof Framing

Biosolids Program



New Facility Needed

System components have reached the end of their useful life

Solids handling system deteriorated faster than expected (~35% capacity)

Industrial discharge impacts have significantly increased solids loading

Continuous challenges to meeting daily permit requirements

Biosolids Equipment Challenges



Existing Dryers are at the End of Useful Life – 1 of 4 in Operation



Typically 3 of 5 Dewatering Centrifuges in Operation– Not Keeping Up with Demand



Increased Odors and Reduction in Treatment Reliability



~20% of Dewatered Cake is Going to Landfill



Limited Digester Capacity for Waste Activated Sludge



A New Biosolids Facility is Needed

Limitations

- Out of Service Units Limit Quantity of Solids Processed
- Restriction on Number of Trucks Hauling due to Odors

Consequences

- Permit Non-Compliance
- Unplanned Repairs
- Higher Operating Expense

Emergency Biosolids Certification

Restore Capacity

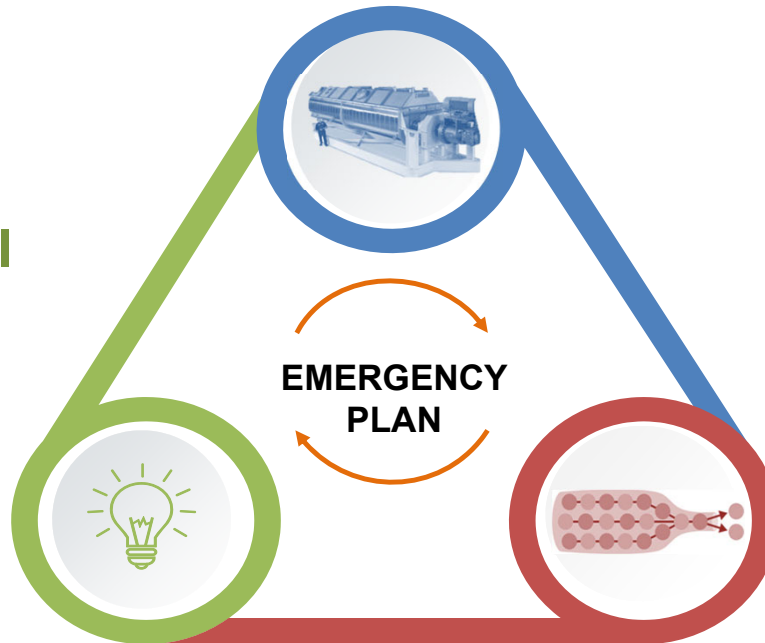
- Centrifuges & dryers need repair/replaced
- Evaluations underway to get all operational

Off-Load Regional WQTC Solids

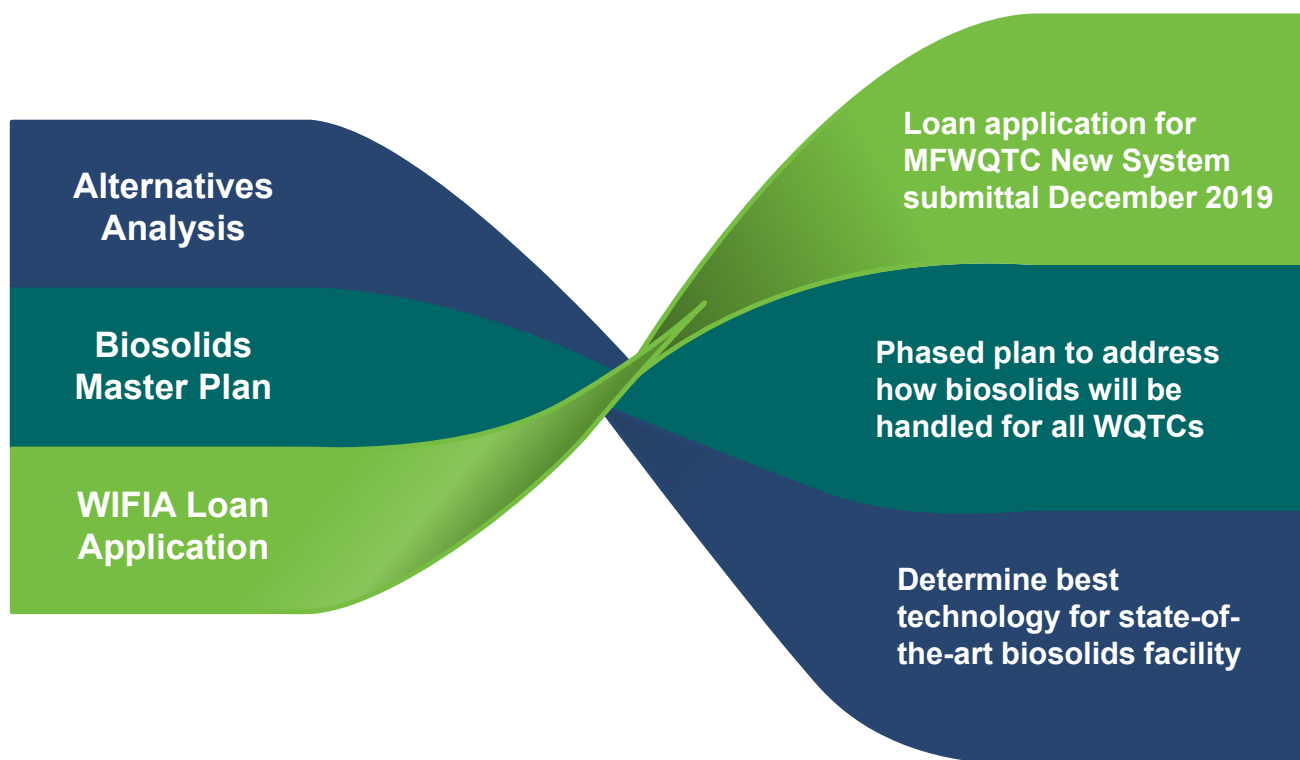
- Direct the regional solids to DRGWQTC
- Add 2nd centrifuge to HCWQTC

Remove Bottlenecks & Control Odors

- Waste Management limiting to number of trucks/day
- Odor control evaluation
- Receiving quotes from other landfills



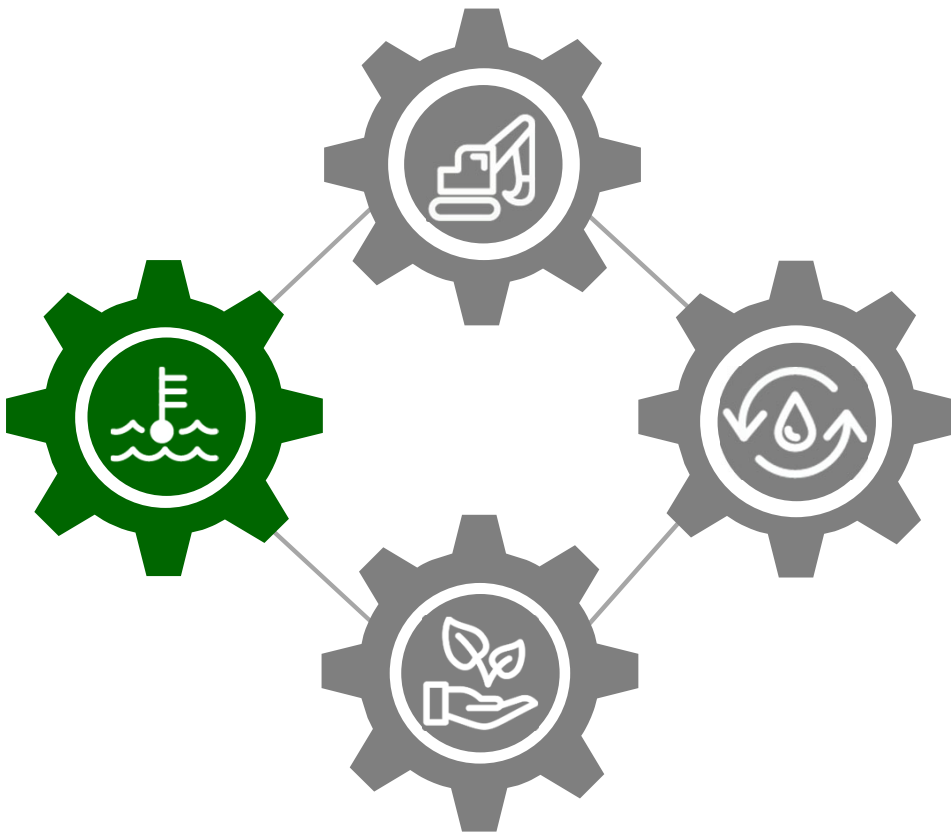
Long-Term Biosolids Plan



Benefits

- Provide reliable & treatment for biosolids
- Improve quality of treated effluent at MFWQTC
- Produce ~4 MW power
- Decrease consumption natural gas at MFWQTC
- Reduce volume of solids & landfill capacity utilization

Ohio River Flood Protection System



U.S. Army Corps of Engineers Evaluation

22.2 miles of earthen levee, 3.9 miles of concrete wall, 16 pump stations (73 pumps), 152 gates

System protects 240,000 people and \$60B in property within levee area

Includes 60+ year old FPSs sized based on 1930's rainfall data

Most FPSs are operating with original parts that are not available for replacement

Ohio River Flood Protection System

USACE study underway to quantify needs and leverage federal funding for reliability improvements but **EXCLUDES** capacity upgrades

Preliminary discussions have indicated design for the FPS Reliability Improvements Projects could begin in FY2021 with construction advancing FY23 through FY 25.

Component of Reliability Improvements	USACE Estimated Cost
Flood Pump Stations	\$121,651,000
Levees & Floodwalls	\$25,147,000
Cultural Resource Mitigation	\$121,000
Land Acquisition	\$130,000
Preconstruction Engineering	\$13,347,000
Construction Management	\$7,346,000
TOTAL	\$167,742,000

These costs do not represent all needed FPS asset needs. It only lists the reliability improvements identified by USACE's Tentatively Selected Plan.

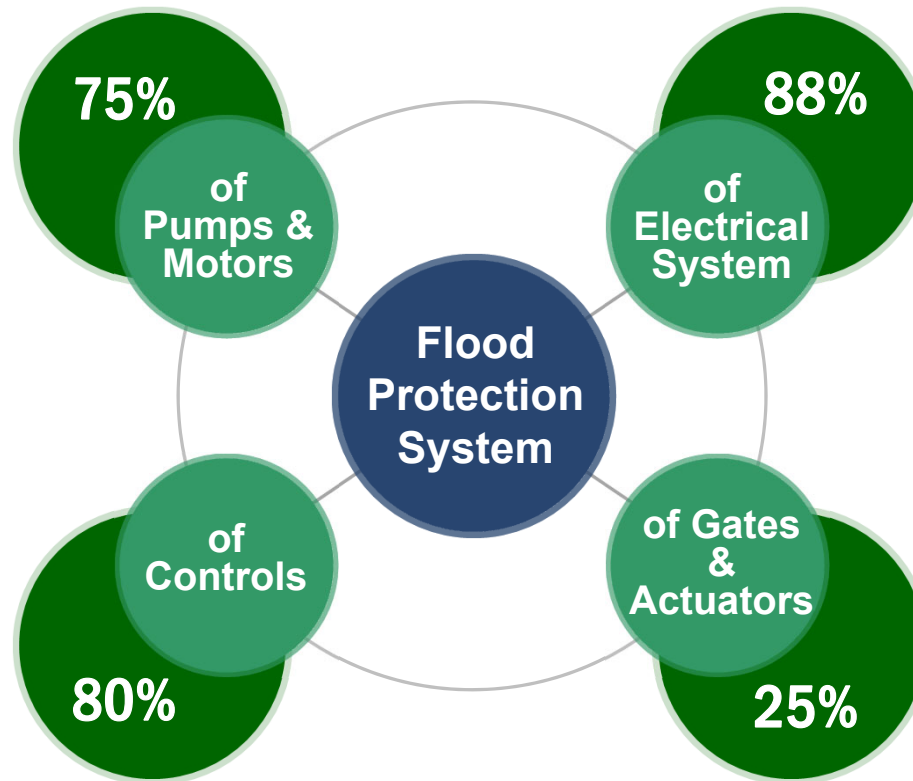
US Army Corps of Engineers Recommendations

20 Pump Rebuilds & 35 Pump Replacements

The original pumps, motors, and ancillary systems are still in service and have not had a major rebuild since they were originally installed.

Controls System at 13 Pump Stations

The control systems are rudimentary by today's standards, requiring the station to be fully staffed at all times during flood pumping operations.



12 MCCs & 14 Transformer Replacements

The electrical system is original equipment, which cannot be repaired with currently available components.

15 new actuators, 13 new gates, & 10 gates to be refurbished

Most of the 152 gates are 65 years old.

Breakdown of 15-Year CIP for *Infrastructure Risks*

- \$608M Critical Flood Pump Station Assets
- \$300M Critical Wastewater Collection Assets
- \$300M First phase of New Morris Forman WQTC
- \$200M New Biosolids Facility
- \$130M Critical WQTC Assets
- ***\$1,538M Total***

Due to competing Utility infrastructure needs, MSD has forecasted being able to address only a portion of its critical assets over the next 15 years.

Has Your Perception Changed?



- -
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Determining How to Pay for Infrastructure Needs

12.10.19



Breakdown of 15-Year CIP for *Infrastructure Needs*

INFRASTRUCTURE RISKS

- \$608M Critical Flood Pump Station Assets
- \$300M Critical Wastewater Collection Assets
- \$300M First phase of New Morris Forman WQTC
- \$200M New Biosolids Facility
- \$130M Critical WQTC Assets
- **\$1,538M Total**

PLUS

INFRASTRUCTURE NEEDS

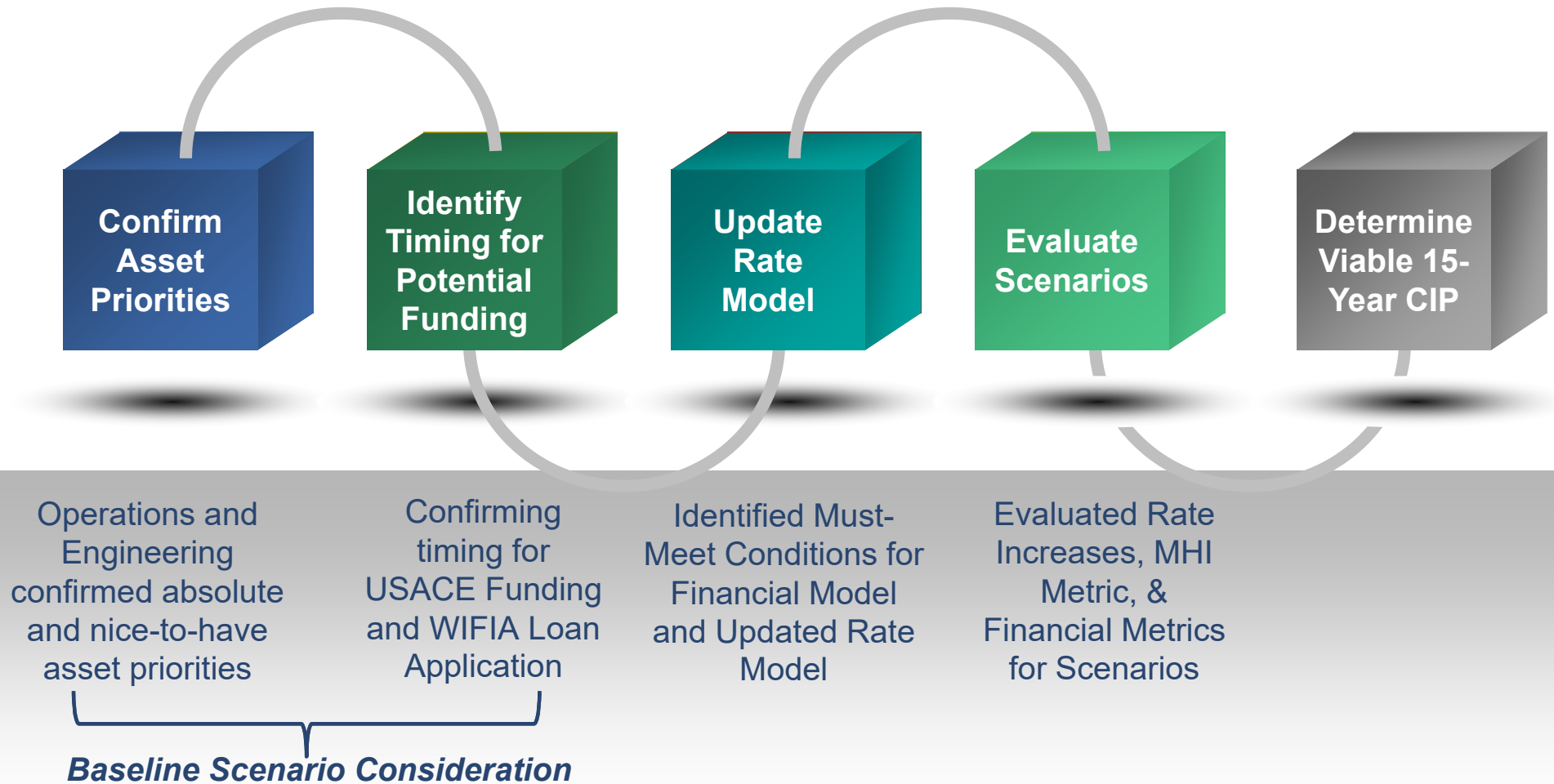
- \$340M Remaining IOAP Projects
- \$265M Interior Drainage
- \$260M CMOM Program and Routine Asset Management
- \$200M Development & Expansion
- \$110M Utility Support Projects
- \$50M Capital Equipment
- \$45M MS4 Water Quality Program
- \$30M Facilities (i.e. building structures)
- **\$1,300M Total**

Risks vs Needs

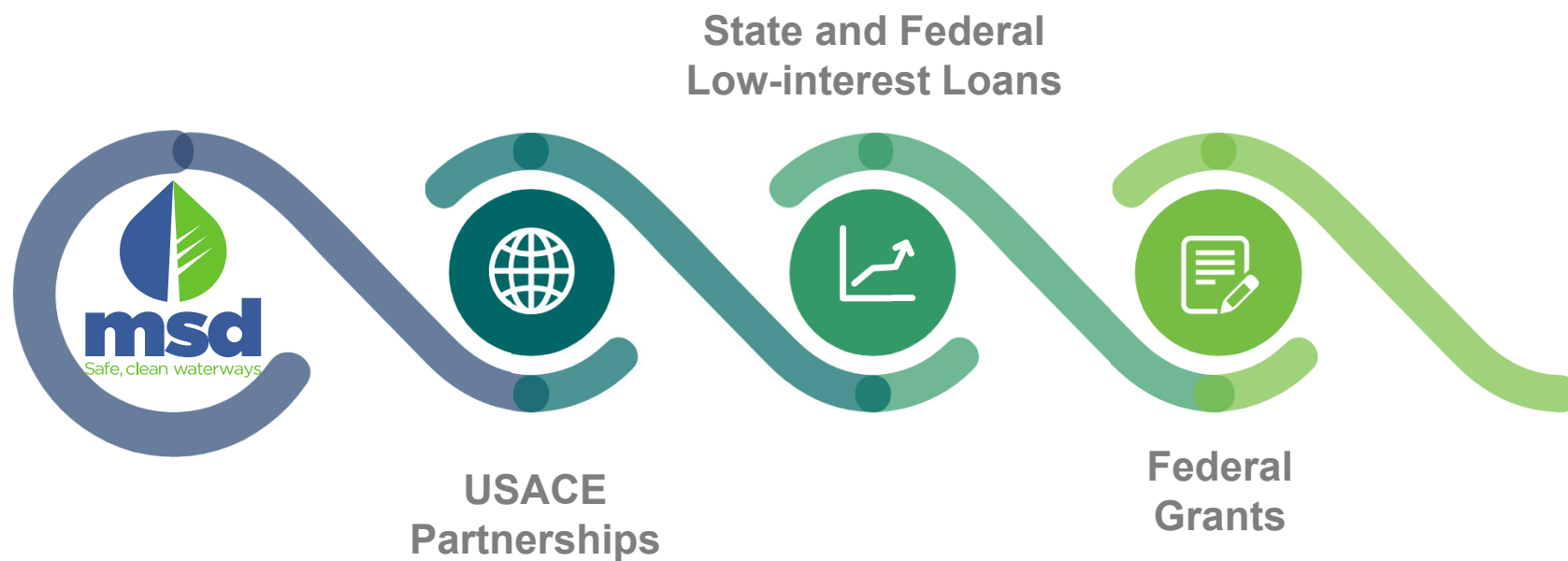
Risks – replacement or rehabilitation of assets with *high consequence of failure and critical* to operations

Needs – Industry standard approach for maintaining assets as well as new infrastructure development to satisfy designated level of service

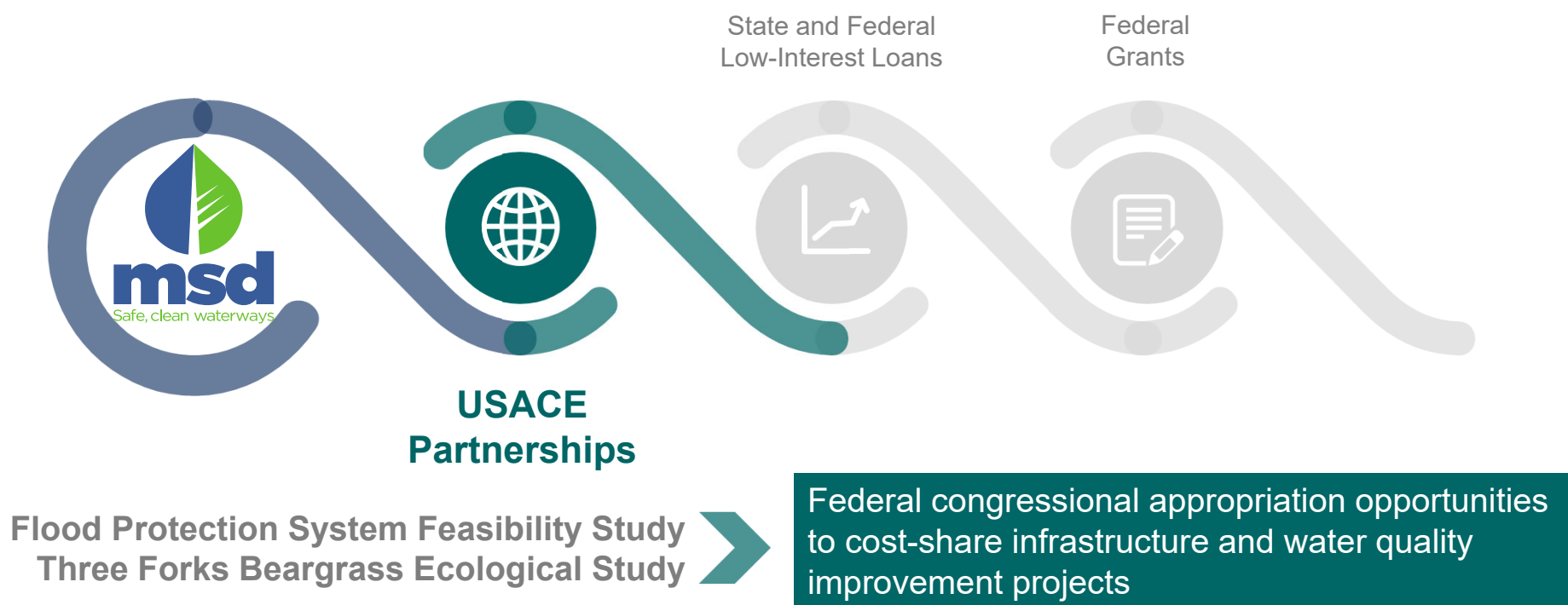
How We Consider How Much to Spend



Leveraging Cost Sharing Opportunities



Leveraging Cost Sharing Opportunities



Leveraging Cost Sharing Opportunities

State Revolving Fund (SRF)
Water Infrastructure Finance and Innovation Act (WIFIA)

Highly competitive financing for large clean water infrastructure projects.



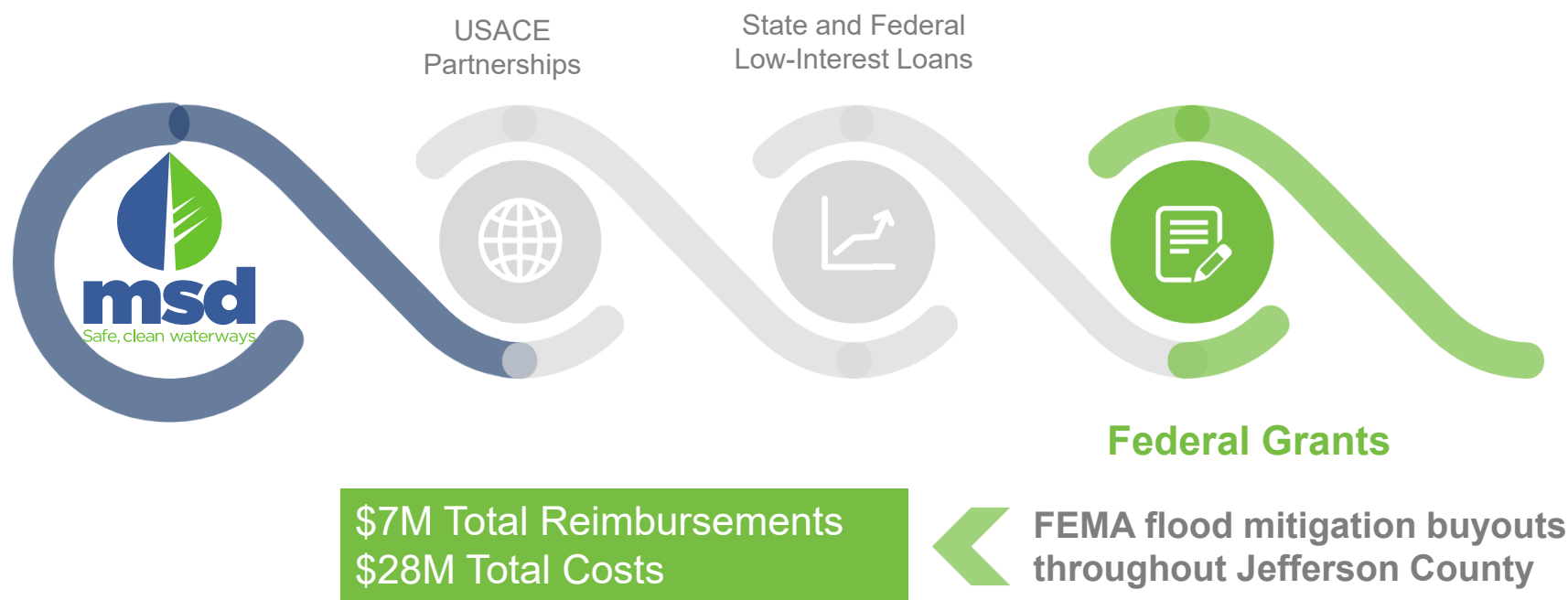
USACE
Partnerships

**State and Federal
Low-Interest Loans**

Federal
Grants



Leveraging Cost Sharing Opportunities



Discussion

Customer Awareness Survey Results



December 10, 2019

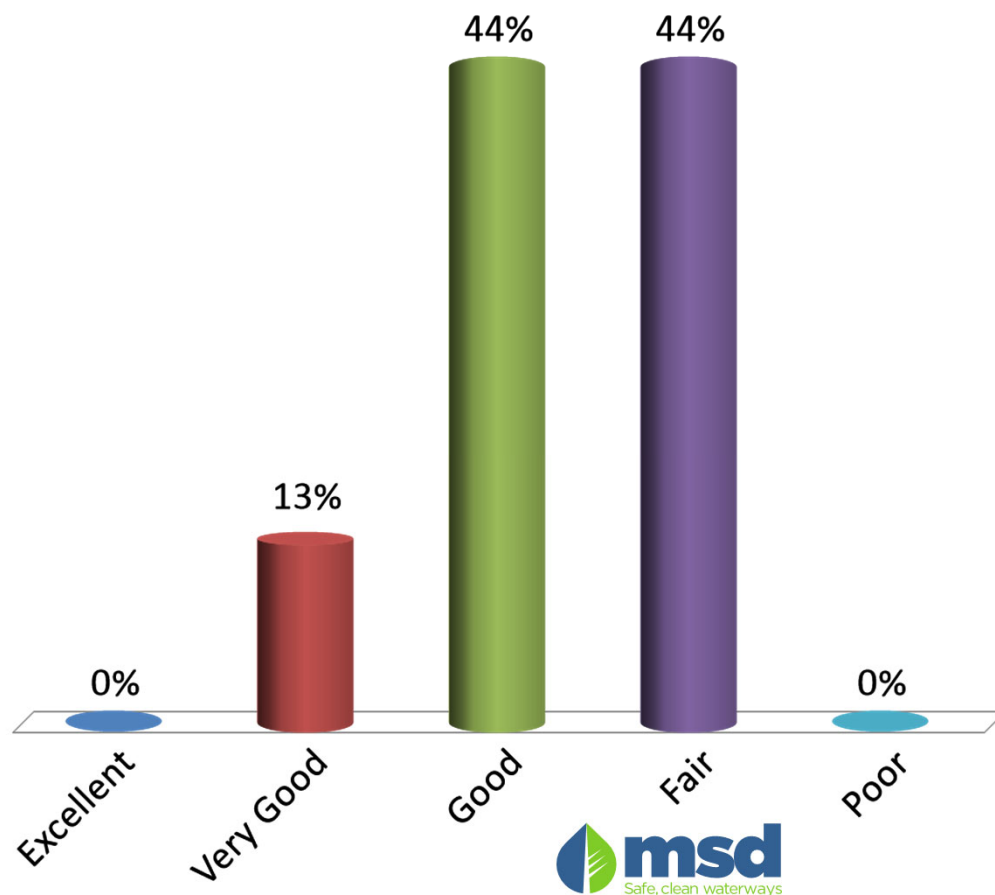


Customer Awareness Survey

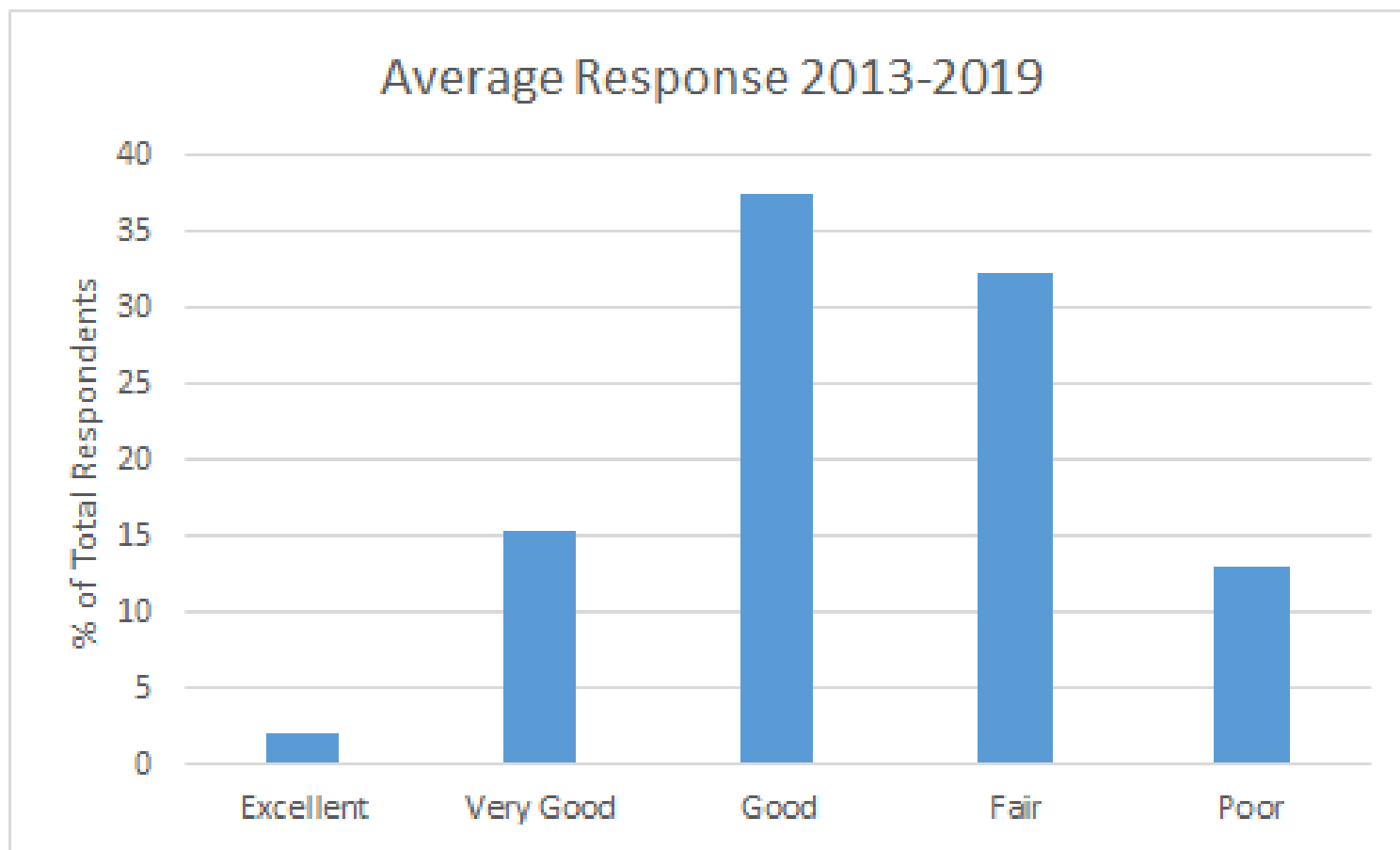


How would you rate the overall water quality or health of the river, creeks, and ponds in Jefferson County, Kentucky?

- A. Excellent
- B. Very Good
- C. Good
- D. Fair
- E. Poor

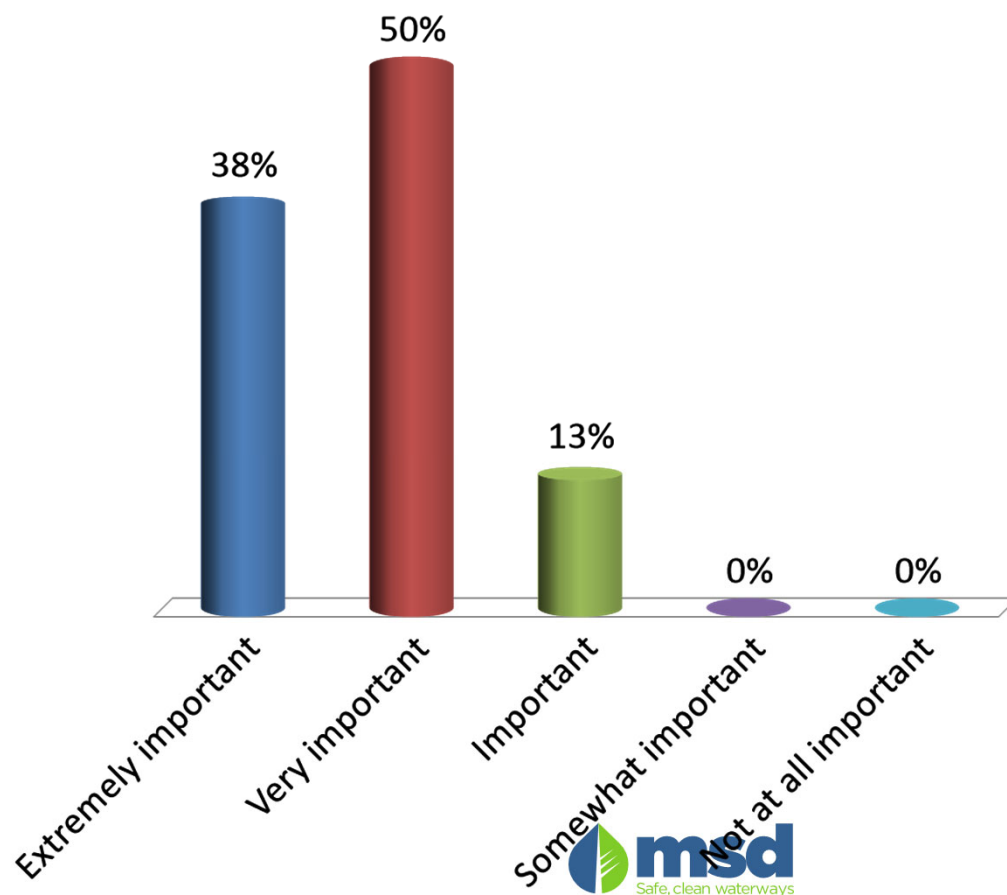


How would you rate the overall water quality or health of the river, creeks, and ponds in Jefferson County, Kentucky?

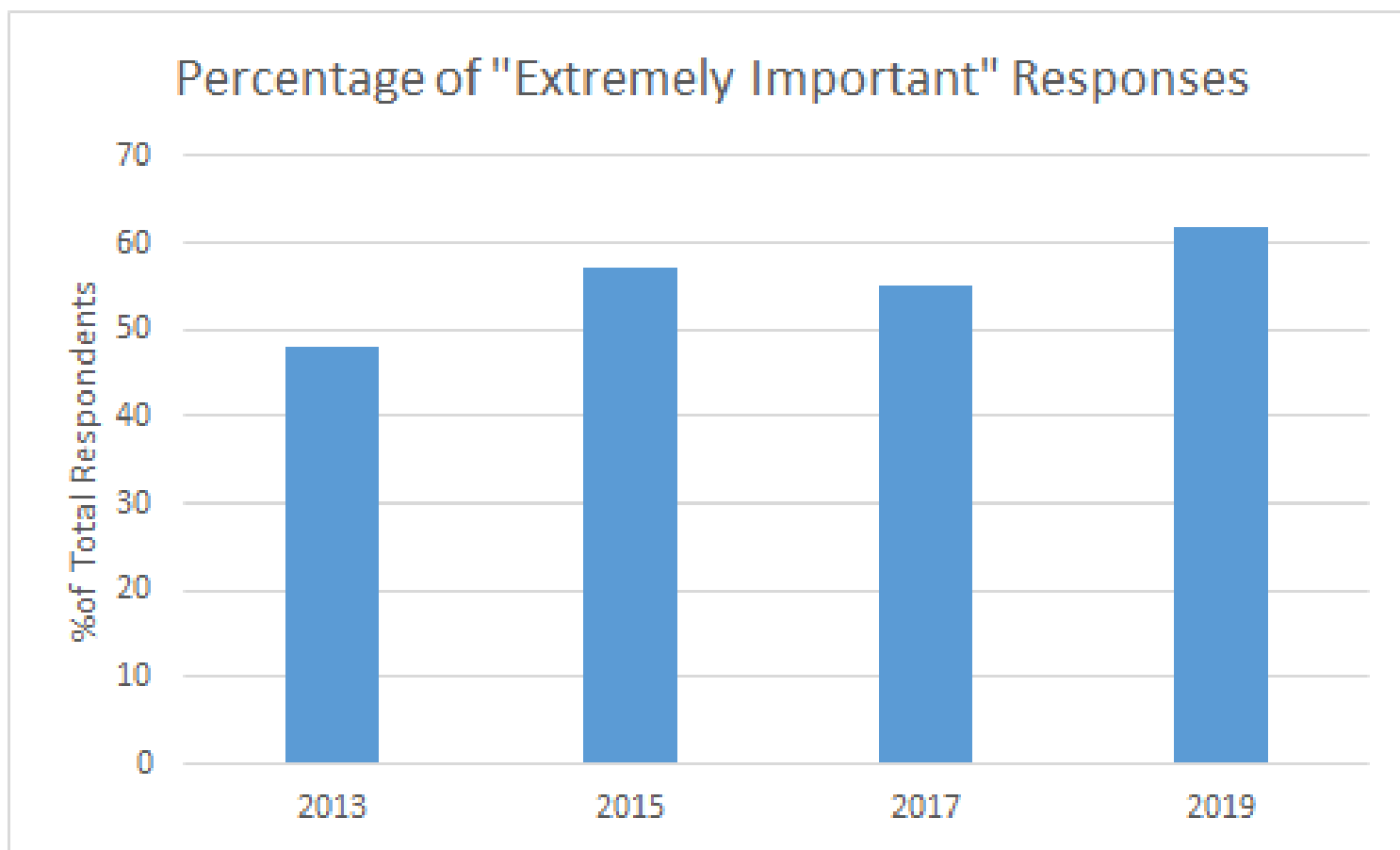


How important is it to you that your community has clean rivers, creeks and ponds?

- A. Extremely important
- B. Very important
- C. Important
- D. Somewhat important
- E. Not at all important

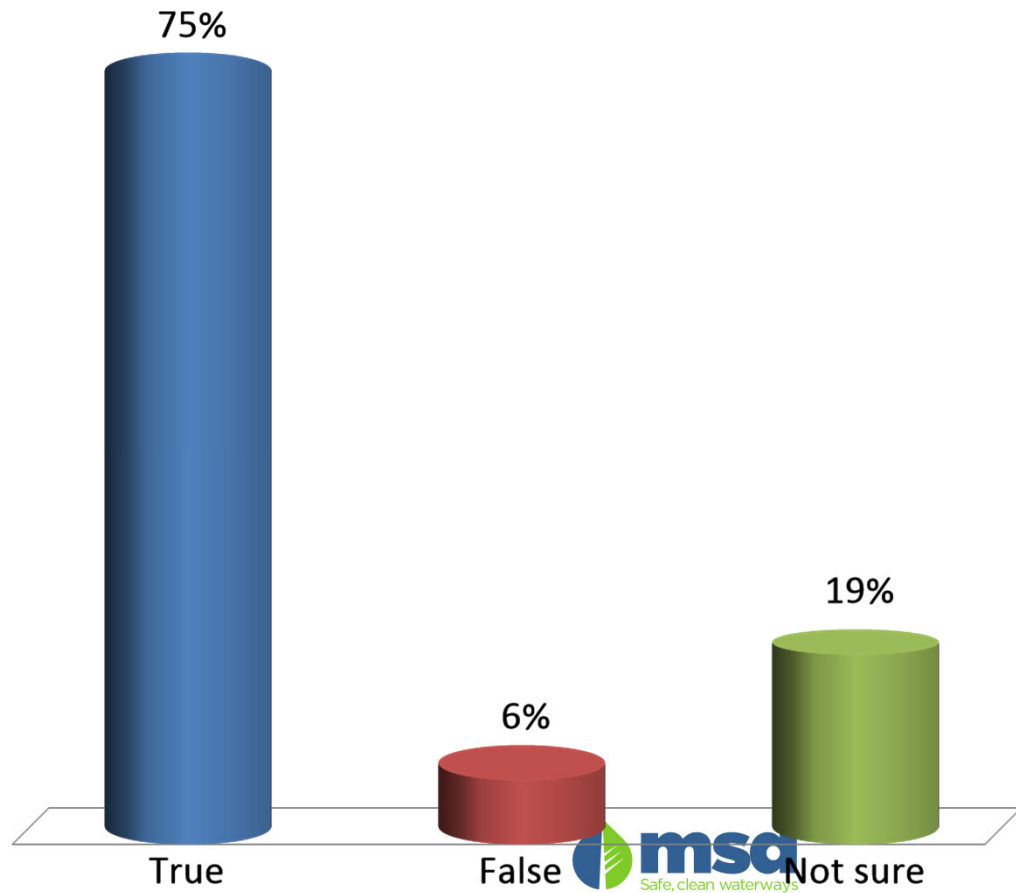


How important is it to you that your community has clean rivers, creeks and ponds?

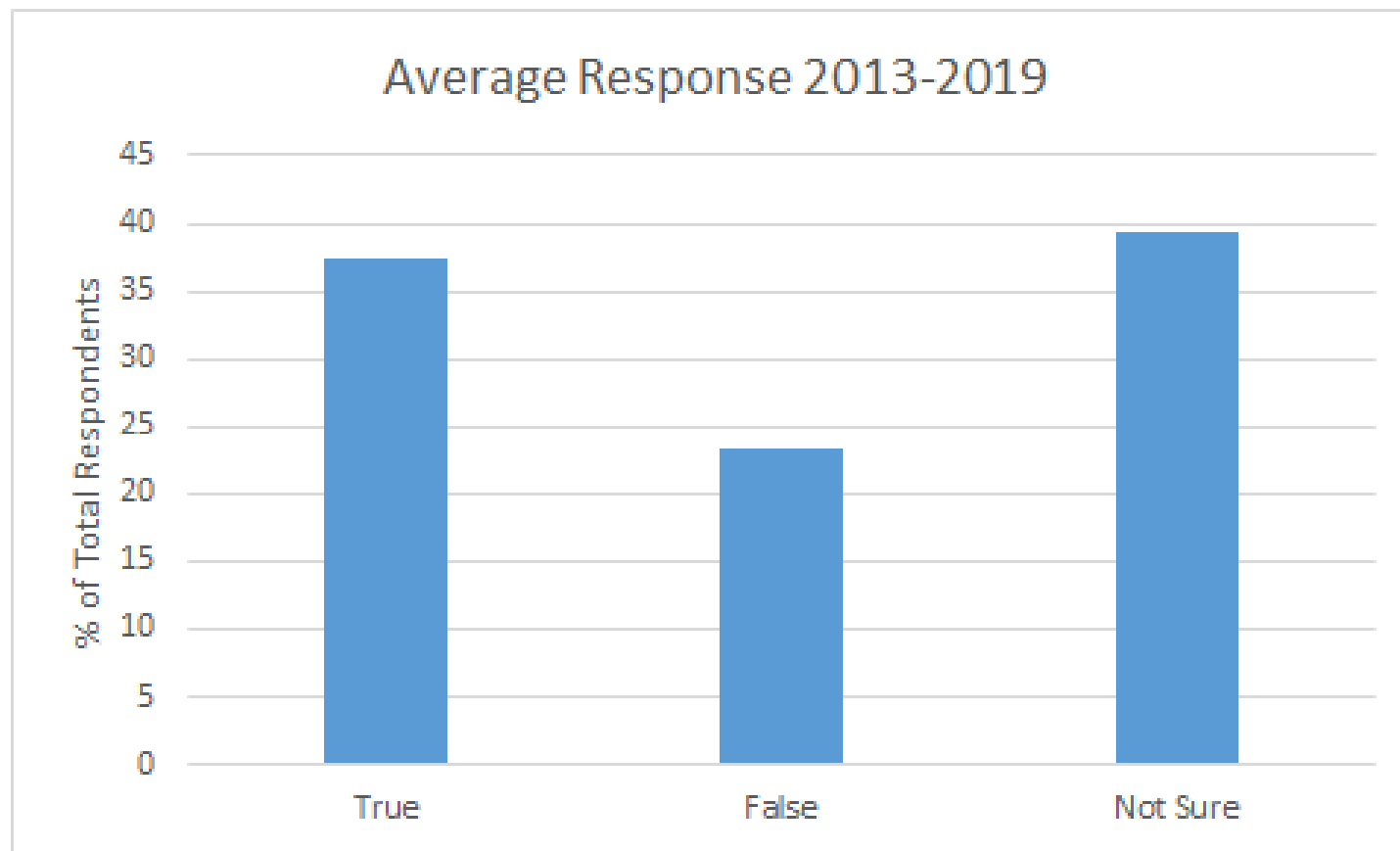


After it rains, you should not use the local area river, creeks and ponds because they have become unsafe with increased levels of pollution and bacteria.

- A. True
- B. False
- C. Not sure



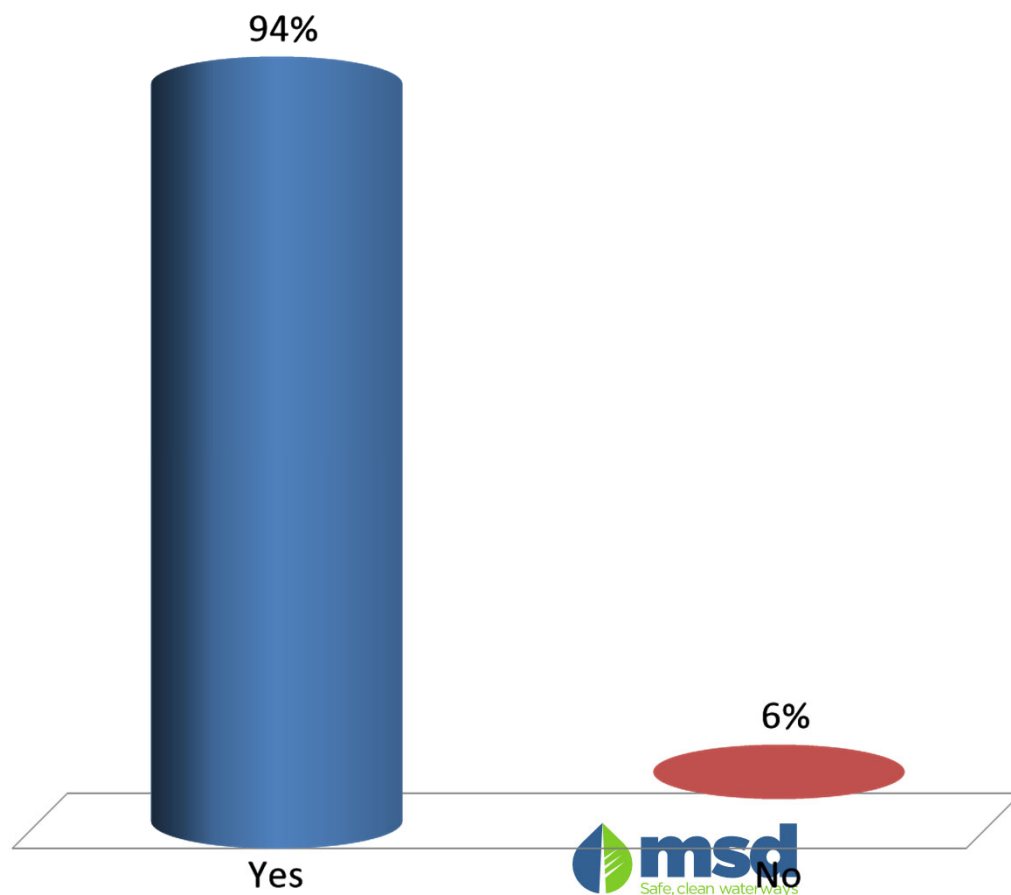
After it rains, you should not use the local area river, creeks and ponds because they have become unsafe with increased levels of pollution and bacteria.



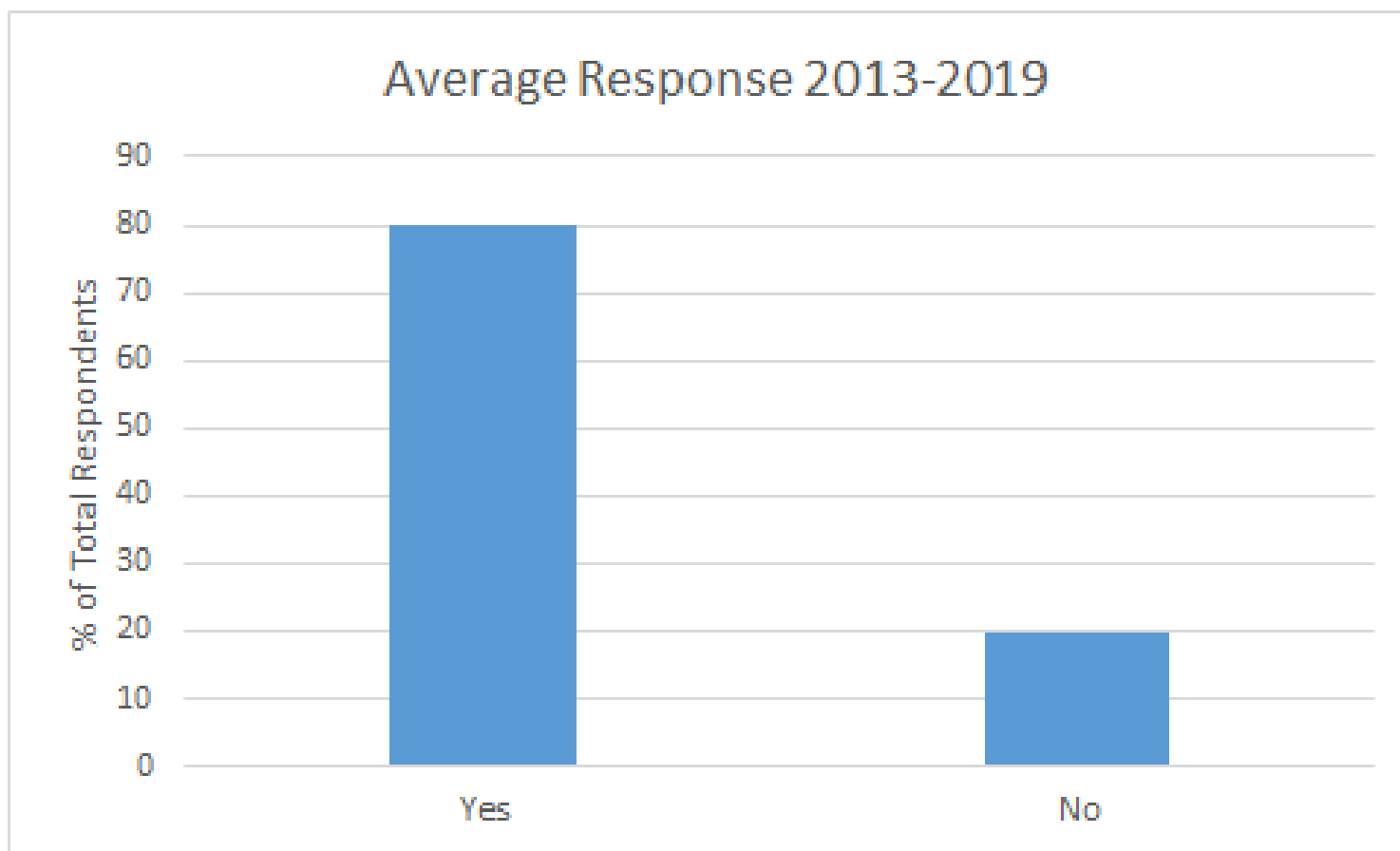
Do you think there are actions you can take to reduce water pollution in the river, creeks and ponds?

A. Yes

B. No



Do you think there are actions you can take to reduce water pollution in the river, creeks and ponds?



Key Findings from Customer Awareness Survey



Utilize survey results to refine strategic communication and public education messages

- Louisville residents see the value in protecting the community's waterways
- In 2019, more residents said that they are taking action or are willing to take action to reduce water pollution
- Residents said that they are more likely to pay attention to evidence-based messages delivered through a variety of media

IOAP Update

December 10, 2019



Program and Project Accolades



Capital Improvement Project Accolades

Southwestern Parkway CSO Basin Project



ACEC of Kentucky Engineering Excellence Grand Award

Design-Build Institute of America

- **National Award of Merit – Water/Wastewater Category**
- **National Award of Excellence – Water/Wastewater Category**
- **Best in Design – Engineering**



Capital Improvement Project Accolades

Clifton Heights CSO Basin Project



ACEC of Kentucky Engineering Excellence Honor Award

Associated Builders and Contractors Award of Excellence in Construction

American Public Works Association Kentucky Chapter Project of the Year in Sanitary CSO Category

Capital Improvement Program Accolades

Ohio River Flood Recovery

**FLOOD
RECOVERY
SUPPORT**

**STORMWATER
CATEGORY**



APWA Kentucky Chapter Stormwater Project of the Year

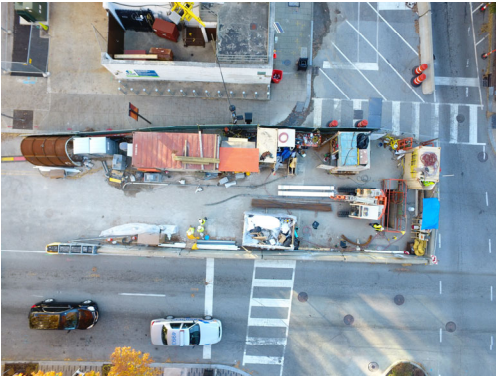
MSD Real Time Control



**Franz Edelman Award for Achievement in Advanced Analytics,
Operations Research, and Management Science**

Capital Improvement Project Accolades

Ohio River Interceptor Emergency Repair Project

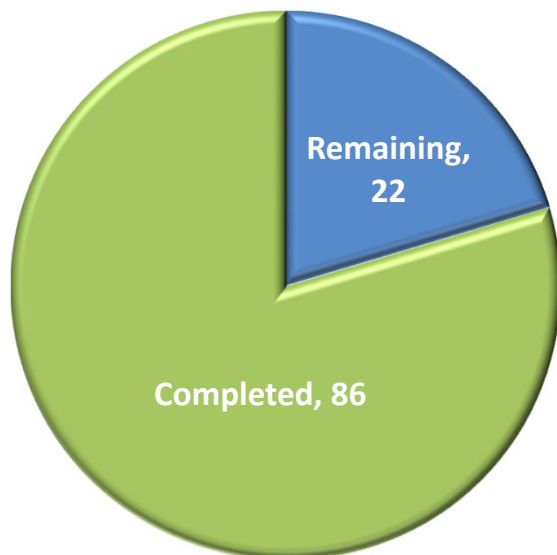


- Clean Water Professionals KY/TN Outstanding Overflow Abatement Award
- ACEC of Kentucky Engineering Excellence Grand Award
- Engineering News and Report Midwest Region Best Project – Water/Environment (Up for National Award)
- American Public Works Association Kentucky Chapter Project of the Year

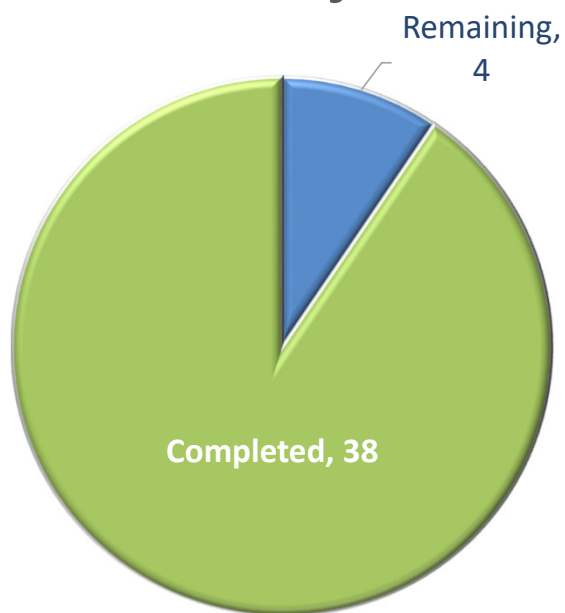
Regulatory Compliance



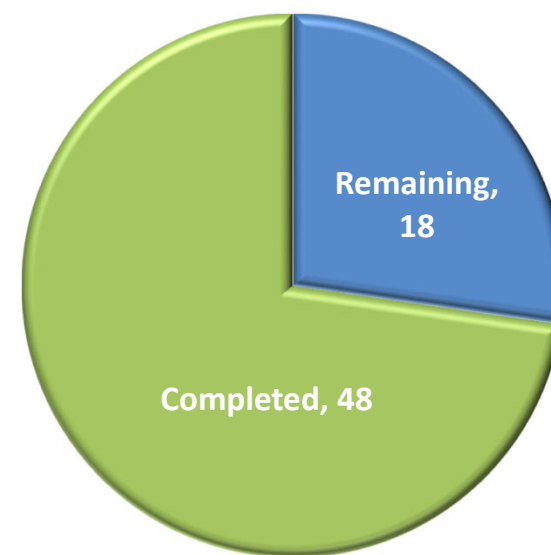
IOAP Projects



CSO Projects



SSO Projects



IOAP Projects

The map displays the Morristown area, including Morristown, Hite Creek, Floyds Fork, Cedar Creek, and Derek R. Guthrie. The map shows the locations of various projects, categorized by color and shape:

- LTCP - Completed:** Green squares
- LTCP - Remaining:** Blue squares
- SSDP - Completed:** Green circles
- SSDP - Remaining:** Blue circles
- MSD WQTC:** Black squares
- Combined Sewer Overflow Area:** Pink shaded region

The map also shows major roads (Interstates 75, 40, 55, 24, 58, 60, 64, 66, 71, 75, 77, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000, 1002, 1004, 1006, 1008, 1010, 1012, 1014, 1016, 1018, 1020, 1022, 1024, 1026, 1028, 1030, 1032, 1034, 1036, 1038, 1040, 1042, 1044, 1046, 1048, 1050, 1052, 1054, 1056, 1058, 1060, 1062, 1064, 1066, 1068, 1070, 1072, 1074, 1076, 1078, 1080, 1082, 1084, 1086, 1088, 1090, 1092, 1094, 1096, 1098, 1100, 1102, 1104, 1106, 1108, 1110, 1112, 1114, 1116, 1118, 1120, 1122, 1124, 1126, 1128, 1130, 1132, 1134, 1136, 1138, 1140, 1142, 1144, 1146, 1148, 1150, 1152, 1154, 1156, 1158, 1160, 1162, 1164, 1166, 1168, 1170, 1172, 1174, 1176, 1178, 1180, 1182, 1184, 1186, 1188, 1190, 1192, 1194, 1196, 1198, 1200, 1202, 1204, 1206, 1208, 1210, 1212, 1214, 1216, 1218, 1220, 1222, 1224, 1226, 1228, 1230, 1232, 1234, 1236, 1238, 1240, 1242, 1244, 1246, 1248, 1250, 1252, 1254, 1256, 1258, 1260, 1262, 1264, 1266, 1268, 1270, 1272, 1274, 1276, 1278, 1280, 1282, 1284, 1286, 1288, 1290, 1292, 1294, 1296, 1298, 1300, 1302, 1304, 1306, 1308, 1310, 1312, 1314, 1316, 1318, 1320, 1322, 1324, 1326, 1328, 1330, 1332, 1334, 1336, 1338, 1340, 1342, 1344, 1346, 1348, 1350, 1352, 1354, 1356, 1358, 1360, 1362, 1364, 1366, 1368, 1370, 1372, 1374, 1376, 1378, 1380, 1382, 1384, 1386, 1388, 1390, 1392, 1394, 1396, 1398, 1400, 1402, 1404, 1406, 1408, 1410, 1412, 1414, 1416, 1418, 1420, 1422, 1424, 1426, 1428, 1430, 1432, 1434, 1436, 1438, 1440, 1442, 1444, 1446, 1448, 1450, 1452, 1454, 1456, 1458, 1460, 1462, 1464, 1466, 1468, 1470, 1472, 1474, 1476, 1478, 1480, 1482, 1484, 1486, 1488, 1490, 1492, 1494, 1496, 1498, 1500, 1502, 1504, 1506, 1508, 15