



City of St. Joseph Integrated Plan for Wastewater and Stormwater

FINAL Vision and Framework

Columbia, MO
August 4, 2023





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1. Introduction

Over the past decades, aging infrastructure, increasingly complex water quality issues, forever chemicals, and challenging economic conditions due to unprecedented events have strained municipal public works management across the country. This situation has been further complicated by federal and state regulatory processes that historically focused on enforcing individual Clean Water Act (CWA) requirements on fixed schedules, without full consideration of all obligations that a utility may be facing or whether compliance efforts will even result in meaningful improvements in environmental and public health.

The City of St. Joseph, Missouri (City) understands the challenges these traditional regulatory requirements frameworks can create for a public utility and its customers. In November 2009, the Missouri Department of Natural Resources (MDNR) approved the City’s revised Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP) to reduce sewer overflows and improve water quality in the Missouri River. The LTCP outlined \$464 million (in 2009 \$) of collection system, wastewater treatment, and stormwater system improvements that the City would implement over a 20 to 30-year timeframe to achieve the goal of capturing 85% of the wet weather flow volume. This original LTCP implementation

schedule came with significant affordability concerns for the City and its customers, particularly lower-income households. Since 2000, the City has had to increase sewer rates by more than 400% to pay for these improvements, with additional rate increases anticipated. These burdens are likely to be exacerbated when new and evolving regulatory drivers continue to force additional upgrades beyond those required by the LTCP in the City’s wastewater and stormwater systems.

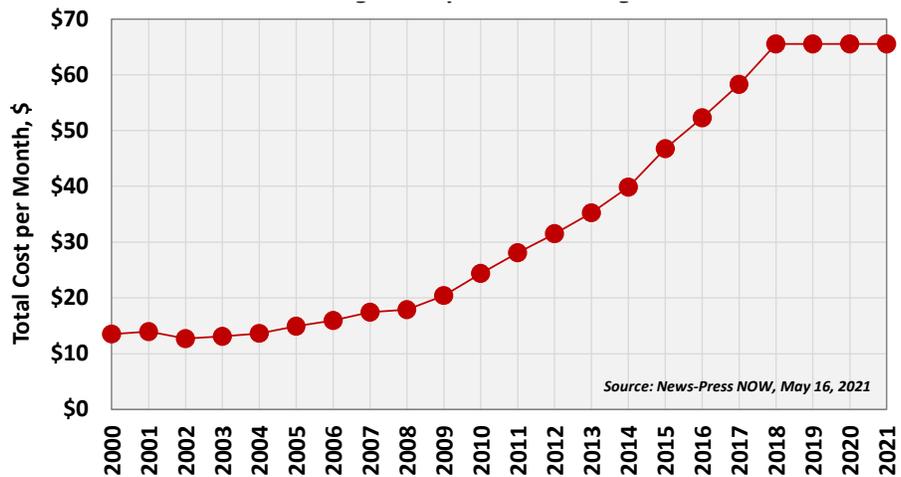


Figure 1. Average Monthly Residential Sewer Bills (assumes 3,750 gallons per month, in 2021\$) in St. Joseph, MO (2000 – 2021).

In 2019, the City entered into an Abatement Order on Consent N. 2019-WPCB-1008 (AOC) with MDNR in an attempt to reduce the compliance costs associated with the 2009 LTCP, redirect the wet weather program to prioritize high-value projects, and provide long-range regulatory certainty. The 2019 AOC outlined over \$206.5 million (in 2019 dollars) of capital projects that would be completed by 2035. The City has diligently completed projects outlined in the AOC on time and has raised rates substantially to comply with these requirements. However, the City recognizes that compliance with the AOC cannot be considered independently of all other wastewater and stormwater needs, as each of these projects is funded by the community’s ratepayers.

In 2012, the US Environmental Protection Agency (EPA) recognized that municipalities require more flexibility to balance long-term system improvements with environmental needs and developed the

*Integrated Municipal Stormwater and Wastewater Planning Approach Framework (Framework)*¹ to support communities in their planning efforts. The Framework includes six elements that outline a planning process, while acknowledging that integrated plans should be appropriately customized to the size and needs of the community. In January 2019, EPA's Framework was codified into Section 402(s) of the Clean Water Act (CWA).

The Missouri Department of Natural Resources (MDNR) also understands the value that integrated planning (IP) provides and supports municipality efforts to develop implementation schedules that align with community priorities and affordability². Since the passage of Missouri's municipal affordability statutes (644.145 RSMo), MDNR has developed robust processes for evaluating the municipal financial capability to afford wastewater and stormwater programs and has emerged as a leading state agency in these assessments.

EPA's Framework provides St. Joseph with a useful approach for developing a long-term investment strategy that appropriately prioritizes and schedules wastewater and stormwater work that protects human health and the environment, aligns with community priorities, meets regulatory obligations, and is affordable. This flexibility is specifically referenced within the AOC as the "Verification Evaluation of Remaining Projects", which must be completed by December 2024. The City intends to use EPA's IP Framework to satisfy this AOC requirement.

Using the EPA Framework, the City will outline a revised, implementable plan that more fully evaluates the effectiveness of previous wet weather improvements while capturing and prioritizing new investments needed to meet water quality requirements, renew aging infrastructure, and meet customer service demands. Through the integrated planning process, the City will evaluate:

- Water quality benefits resulting from completed projects to determine when or if remaining long-term control plan projects are needed;
- Alternative CSO reduction and green infrastructure projects that generate cost-effective reductions and multiple benefits;
- Improvements at the City's Water Protection Facility to address future permit requirements;
- Existing wastewater and stormwater capital improvement plans (CIPs) to best position the City for funding through new State and Federal programs;
- Evolving state and federal regulatory issues that will drive new program investments over the next 20 – 30 years;
- New grant and loan funding sources to reduce rate impacts and mitigate cost uncertainty; and
- Community priorities and understanding of affordability measures to create an implementable plan.

In 2023, the City retained HDR Engineering, Inc., to assist in developing their Wastewater and Stormwater Integrated Plan (IP). The purpose of this Framework document is to outline the City's anticipated approach for developing the IP. This Framework will guide IP project activities and will serve as the foundation for the planning process going forward. Upon completion of the IP, the City will have an updated, MDNR-approved plan for implementing cost-effective projects that address the community's water-related environmental challenges.

¹ Stoner, N. and C. Giles. 2012. *Integrated Municipal Stormwater and Wastewater Planning Approach Framework*. June 5, 2012. Washington DC.

² Hirschvogel, L. 2016. *Missouri Integrated Planning Framework*. Water Protection Program. Jefferson City, Missouri.

2. Integrated Planning Requirements

In the 2012 Framework, EPA recommended overarching principles that municipalities should consider when developing integrated plans. According to EPA, integrated plans should:

1. Reflect State requirements and planning efforts and incorporate State input on priority setting and other key implementation issues.
2. Provide for meeting water quality standards and other Clean Water Act (CWA) obligations by utilizing existing flexibilities in the CWA and its implementing regulations, policies, and guidance.
3. Maximize the effectiveness of funds by sequencing actions needed to address human health and water quality-related challenges and non-compliance.
4. Evaluate and incorporate, where appropriate, effective sustainable technologies, approaches, and practices, particularly including green infrastructure measures, in integrated plans where they would provide more sustainable solutions for municipal wet-weather control.
5. Evaluate and address community impacts and consider disproportionate burdens resulting from current approaches as well as proposed options.
6. Ensure that existing requirements to comply with technology-based and core requirements are not delayed.
7. Ensure that a financial strategy is in place, including appropriate fee structures.
8. Provide appropriate opportunities for meaningful stakeholder input throughout the development of the IP.

EPA recognizes that municipalities will need to develop integrated plans that are appropriately tailored to the size of the municipality and to the scope and complexity of the issues they face. However, EPA suggests that all integrated plans should generally address the following six elements:

Element 1: A description of the water quality, human health, and regulatory issues to be addressed.

Element 2: A description of existing wastewater and stormwater systems under consideration and summary information describing the systems' current performance.

Element 3: A meaningful process that opens and maintains channels of communication with relevant community stakeholders in order to give full consideration of the views of others in the planning process and during the implementation of the plan.

Element 4: A process for identifying, evaluating, and selecting alternatives and proposing implementation schedules.

Element 5: A process for evaluating the performance of projects identified in a plan.

Element 6: An adaptive management process for making improvements to the plan.

3. St. Joseph IP Project Approach

The City intends to build an affordable, long-term IP that can be adapted to address existing and evolving regulatory, financial, or infrastructure drivers over time. The IP will be tailored to address the known, existing utility and regulatory drivers expected to demand resources over the coming years. These include aging infrastructure, asset management, wet-weather and CSO management, and more stringent ammonia and nutrient discharge requirements.

Projects and solutions to address these and other needs will be prioritized in the IP and resulting implementation schedules will inform AOC revisions and future NPDES permit compliance schedules. The IP will also identify future infrastructure drivers that may evolve and potentially impact the City as the IP is implemented over time. For this reason, the City envisions building the IP in a phased manner to address the most critical existing infrastructure and regulatory drivers first, while allowing adequate time to gather the information needed to assess benefits resulting from projects that have already been completed.

The City will establish an affordable, 5-year Action Plan that outlines the City’s commitment to address known infrastructure challenges, fill data gaps, and perform detailed studies needed to forecast future project costs more precisely. This short-term commitment will be combined with a long-term, 20 to 30-year strategic infrastructure investment plan that provides regulatory and financial certainty over the planning period. Finally, and consistent with Element 6 of the Framework, the IP will include adaptive implementation guidance to provide the City with a roadmap to adjust near- and long-term commitments with changing circumstances, such as local economic conditions, cost escalation, and supply chain issues.

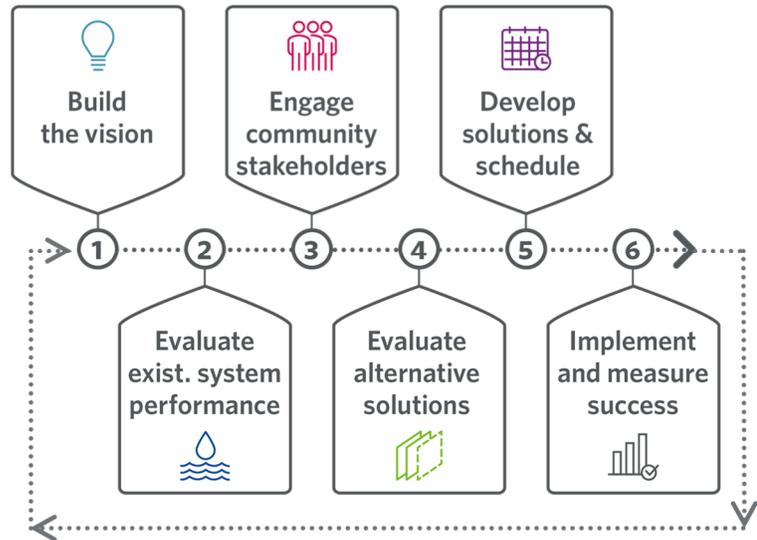


Figure 2. St. Joseph’s Six Integrated Planning Elements, adapted from EPA’s Framework.

The City believes that this tailored approach will lead to the development of an adaptable IP that addresses current regulatory drivers, provides investment certainty over the next 5-10 years, accounts for necessary non-regulatory investments prior to taking on investments to deal with future drivers, and defines affordability for the City’s ratepayers and financial capability for the wastewater and stormwater utilities.

The City intends to apply a modified version of EPA’s six-element Framework to develop the IP. This approach has been used successfully by other Missouri communities like Columbia and West Plains to develop integrated plans and gain approval for those plans from MDNR. A brief summary of the City’s project approach is outlined below.

3.1 Element 1 – Build the Vision

Element 1 involves identifying the important regulatory, environmental, human health, and infrastructure issues that will be addressed. On April 13, 2023, the City conducted a project visioning session to establish the key goals that will serve to focus project activities as the IP is developed. The City's IP goals are as follows:

- **Reevaluate the need for remaining CSO control projects identified in the 2019 AOC.** As described above, the 2019 AOC includes approximately \$206.5 million (in 2019 dollars) of capital improvement projects. To date, the City has completed more than \$100 million of those projects. The remaining projects include screening and disinfection improvements at the Water Protection Facility (WPF), significant improvements at the Whitehead Pump Station, and implementation of a high-rate treatment facility. Before moving forward with these remaining projects, the City is interested in collecting sufficient data to characterize water quality benefits created from recently completed projects, reevaluating the cost and feasibility of the remaining AOC projects, and evaluating more cost-effective solutions or technologies.
- **Consider alternative CSO reduction and Green Infrastructure projects that generate cost-effective reductions and multiple benefits.** The City has experienced success from multiple green-infrastructure projects (green demonstration projects) that have been implemented over the last several years. The IP will assess the overall cost and maintenance of current and additional green demonstration projects to reduce storm flows into the combined sewer system. The IP will also evaluate the opportunity to implement cost-effective collection system improvements that more effectively reduce and convey wet weather flows.
- **Achieve regulatory certainty.** The City faces a number of evolving state and federal regulatory issues that will drive new program investments over the next 20 – 30 years. This IP will address the needs at the Water Protection Facility, the remaining CSO control projects, pretreatment, and other stormwater needs over the long term with the flexibility to adapt the plan as new regulatory drivers such as PFAS, are identified. The City will coordinate with the MDNR throughout the process to gain regulatory approval for the final IP.
- **Maintain affordable rates while funding critical projects.** Financial impacts on all City ratepayers, and specifically disadvantaged communities, must be carefully considered as IP alternatives are developed or implemented. The IP will include a financial capability assessment of existing and future wastewater and stormwater capital improvement plans to identify the most cost-effective and affordable implementation schedules.
- **Support economic growth and development.** The City's wastewater and stormwater programs play an integral role in supporting existing industry, employment, and future growth for the community. The IP should characterize the importance of those connections and provide opportunities to enhance those opportunities.
- **Consider community priorities.** Integrated planning is a community-driven process, so stakeholder and community involvement will be critical to developing an effective IP. As part of the engagement efforts, the City intends to obtain input from a wide variety of community stakeholders and use that input to inform IP development.

3.2 *Element 2 – Evaluate Existing System Performance*

The second step of the City’s IP process is to evaluate the performance and needs of its existing CSO controls, wastewater, drinking water, and stormwater systems. This step directly addresses Element 2 of EPA’s Framework by documenting the previous and ongoing success of sanitary and stormwater projects and policies in the City. It also forms the basis for developing alternatives and asset management programs (Element 4) that will inform short- and long-term capital planning and program needs.

As part of this effort, the City will:

- **Compile Existing Wastewater and Stormwater Performance Data** to develop a comprehensive understanding of existing condition, including the location and frequency of CSOs, sanitary sewer overflows, basement backups, and flooding. Treatment process data will also be gathered to evaluate performance from recent wastewater treatment plant upgrades.
- **Assess Current Surface Water Quality Conditions** to identify current and potential future surface water quality priorities in the City. These data will be summarized to facilitate the development of water quality improvement strategies.
- **Characterize Wastewater and Stormwater Utility Performance, Conditions, and Programs** to understand the effectiveness of existing processes and develop performance baselines that can be used to measure future improvements. This will include an in-depth evaluation and update of the existing combined sewer and separate sewer system models to incorporate the results of recently completed I/I rehabilitation projects, adjust growth or design storm assumptions, refine model calibrations, and improve forecasting accuracy to support the development of alternatives.

Guided by the IP Vision Statement developed in Step 1, the project team will use the information collected in Step 2 to prioritize asset needs, identify critical issues or high-priority areas, and outline important data needs that should be collected to address these issues.

3.3 *Element 3 – Engage Community Stakeholders*

Element 3 of EPA’s Framework requires municipalities to develop a process that opens and maintains channels of communication with relevant community stakeholders in the planning process and during implementation of the plan. The City will develop and implement a meaningful outreach strategy that engages elected officials, customers, key stakeholders, and MDNR staff throughout the planning process.

As the project progresses, the City intends to create a Community Outreach Plan to involve the community in IP decision-making. The approach will focus on bringing people from the community together, educating them about the various issues, and gathering input in a structured, inclusive, and transparent process.

3.4 *Element 4 – Evaluate Alternative Solutions*

Guided by the goals and objectives identified in Element 1 and the existing performance data gathered in Element 2, the City will identify and assess solutions for system and water quality improvements. This is by far the most complex step in the planning process, as the preference is to identify alternatives that could be implemented affordably and provide a net environmental benefit. As part of this effort, the City will evaluate the potential for implementing projects identified in the current capital improvement plan (CIP) and the 2019 AOC, as well as new, more cost-effective solutions that produce equal or greater benefits.

To conduct the assessment, the City will:

- **Establish wastewater and stormwater level of service (LOS) goals** that are measurable, affordable, and consistent with local priorities.
- **Identify programmatic and capital wastewater collection and stormwater management system alternatives** that will approach the desired LOS goals for conveyance and water quality improvement. When necessary, data gaps needed to inform asset management decisions will be identified. Immediate opportunities to optimize existing assets or prioritize existing management activities will also be evaluated. Potential capital improvements may include conveyance, storage, green infrastructure improvements, or rehabilitation recommendations informed by hydraulic model evaluations, currently planned or identified CIP projects, and engineering judgment.
- **Identify wastewater treatment alternatives** that can be used to improve WPF operations, address nutrient regulatory drivers, and provide sustainable treatment practices.
- **Develop a financial capability analysis (FCA) tool** to evaluate the financial impacts of identified alternatives on the City's ratepayers, particularly low-income customers.
- **Prioritize program improvements and projects** that provide the most environmental and public health benefits for the lowest cost to ratepayers.

3.5 Element 5 – Develop Recommendations and Schedules

Once alternatives are developed and their associated costs are adequately characterized, the City will work to identify the right set of alternative analysis tools to assist in making confident and well-informed investment decisions. One of the challenges of any decision-making process is appropriately comparing alternatives that have quantitative and qualitative benefits. To accomplish these goals, the City will employ an industry-standard Triple Bottom Line (TBL) analysis to evaluate the environmental, social, and economic impacts or benefits of alternatives.

In general, the City will develop an implementation schedule that prioritizes the highest-benefit projects first and defers low-benefit projects. Before committing to an implementation schedule in the final plan however, it will be critical to forecast the financial impacts of proposed solutions on the City and its customers. Significant rate increases have already led to affordability challenges and caused frustration among customers and elected officials. The acceptance and ultimate success of the IP will hinge on demonstrating that the proposed plan will mitigate future rate increases and establish rate certainty going forward.

3.6 Element 6 – Implement and Measure Success

Adaptive management approach is key to successful integrated planning. This means monitoring and evaluating projects and practices as work proceeds and adapting or revising plans and designs as appropriate, based on lessons learned. Evaluations as work proceeds can often be more effective than a monitoring program confined to post-construction.

To facilitate adaptive management and implementation, the IP will identify a long-term (20-30 year) implementation schedule that reflects the current understanding of infrastructure needs and priorities, as well as a five-year Action Plan that outlines the specific near-term projects and planning activities that the City will implement. At the end of the first five-year period, the City will evaluate IP progress and make necessary adjustments during future phases to ensure continuing progress towards satisfying infrastructure demands and meeting regulatory obligations



4. Project Schedule

The City is targeting December 31, 2024, for the final IP. This completion date aligns with the 2019 AOC deadline for the “Verification Evaluation of Remaining Projects.” Upon completion, the City will have an updated, regulator-approved plan for implementing cost-effective solutions that address the community’s water-related environmental challenges. A more detailed schedule will be provided to the community and City Council as work progresses.

Task	Apr-23	Jun-23	Aug-23	Oct-23	Dec-23	Feb-24	Apr-24	Jun-24	Aug-24	Oct-24	Dec-24
Build the Vision (Element 1)											
Regulatory Coordination											
Existing System Review (Element 2)											
Community Outreach (Element 3)											
Develop Alternatives (Element 4)											
Scheduling and Funding Model (Element 5)											
Implement and Measure Success (Element 6)											

Figure 3. Preliminary St. Joseph IP Project Schedule.



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