Exhibit No.:	
Issues:	Capital Investment Program, Description of Plant Additions
Witness:	Derek Linam
Exhibit Type:	Direct
Sponsoring Party:	Missouri-American Water Company
Case No.:	WR-2024-0320 SR-2024-0321
Date:	July 1, 2024

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. WR-2024-0320
CASE NO. SR-2024-0321

DIRECT TESTIMONY

OF

DEREK LINAM

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY

AFFIDAVIT

I, Derek Linam, under penalty of perjury, and pursuant to Section 509.030, RSMo, state that I am Deputy Director of Engineering for Missouri-American Water Company, that the accompanying testimony has been prepared by me or under my direction and supervision; that if inquiries were made as to the facts in said testimony, I would respond as therein set forth; and that the aforesaid testimony is true and correct to the best of my knowledge and belief.

Derek Linam

July 1, 2024
Dated

DIRECT TESTIMONY
DEREK LINAM
MISSOURI AMERICAN WATER COMPANY
CASE NO.: WR-2024-0320
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DIRECT TESTIMONY

DEREK LINAM

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Derek Linam. My business address is 727 Craig Rd, Creve Coeur, Missouri 63141

Q. By whom are you employed and in what capacity?

A. I am employed by Missouri-American Water Company ("MAWC" or the "Company") as Deputy Director of Engineering.

Q. Please summarize your educational background and business experience.

A. I received a Bachelor of Science degree in Civil Engineering in 1991 from the University of Arkansas. I am a registered Professional Engineer in Missouri. I am also a licensed Missouri Department of Natural Resources Level A water treatment operator and a licensed DSIII distribution system operator. I have more than 33 years of experience in the water and wastewater utility industry. I worked as an engineer with Missouri American Water Company (formerly St Louis County Water Company) in the engineering and production departments managing capital investment projects in the transmission & distribution system as well as the production facilities from 1991 to 1999. My work included hydraulic analysis, new installation or replacement of transmission and distribution water mains, and water treatment plant capital projects. In 1999, I was promoted to Operations Superintendent in the St. Louis District Production department at MAWC, where I was responsible for the operations and maintenance of the south area water treatment plants. In 2000, I was promoted to Engineering manager for MAWC where I was responsible for the

capital delivery program in the St Louis County District. In 2003, I was the Operations Manager for the transmission and distribution system in the St Louis operation of the Company, where I was responsible for the construction and maintenance departments. In 2008, I moved back to the engineering department as the Engineering Manager responsible for capital asset planning and/or capital project delivery for the Company in Missouri. In 2022, I was promoted to Deputy Director of Engineering for MAWC.

Q. What are your current employment responsibilities?

A. As Deputy Director of Engineering, I oversee and manage the design and construction of water, wastewater, and other general facilities for MAWC. My responsibilities include administering the capital program for the Company.

Q. Are you generally familiar with the operations, books and records of MAWC?

A. Yes.

Q. Have you previously testified before the Missouri Public Service Commission?

A. Yes. I have testified in Commission Case No. WC-2002-0277 and filed written testimony in case WR-2022-0303.

Q. Are you sponsoring any schedules in this proceeding?

A. Yes. **Schedule DRL-1 – CONFIDENTIAL**, which addresses the significant capital investment projects proposed in this case. This information is deemed in accordance with Commission Rule 20 CSR 4240-2.135(2)(A).3 and 4, as it contains marketing analysis or other market-specific information for competitive services and other market specific information relating to goods or services purchased or acquired for use by a company in providing services to customers.

Q. What is the purpose of your Direct Testimony in this proceeding?

A. My Direct Testimony addresses two topics. First, I will describe the capital investment planning and governance that support the Company's investments in water and wastewater utility plant and equipment. Second, I describe the significant capital projects (defined as those placed in service and having a Company investment greater than $1,000,000 for water and $500,000 for wastewater) by MAWC since the conclusion of the test year in MAWC's last general rate case, through the completion of the test year for this rate proceeding (January 1, 2023 through May 31, 2026). Additional project information such as in service dates, and final costs are included as an attachment to this Direct Testimony as **Schedule DRL-1 – CONFIDENTIAL**.

II. CAPITAL INVESTMENT PLANNING PROCESS

Q. Does MAWC have a planning process for capital investment projects?

A. Yes. MAWC has a comprehensive capital planning process that assesses capital investment needs for all aspects of operations and assigns funding to capital programs on a prioritized basis.

Q. How does the Company decide what capital projects to pursue?

A. The Company uses a standardized Capital Program Management ("CPM") process to assess and prioritize its capital investment needs and produce a capital investment plan. Numerous factors are considered when determining funding allocations for infrastructure investment, such as current and future service needs, assessments of the physical condition of existing plant, economic and risk factors, performance characteristics, regulatory compliance, available capital, and the potential to coordinate with municipalities and other utilities in joint improvement projects. The CPM's planning studies, prioritization activities

and other assessments provide a forward-looking review of the needs of the system and the infrastructure and prioritizes among projects to allow the Company to continue to operate safely, efficiently and meet current and future regulations. By having a good project planning, budget and ongoing review process, the Company is able to select among competing capital needs and manage a wide variety of projects within the overall cost of its plant construction budget. The CPM also includes a governance process consisting of: (1) formal approvals and consistent controls that optimize the effectiveness of asset investment; (2) dedicated project managers responsible for managing the stage of the project and overseeing project spending; and (3) monthly monitoring of the status of ongoing projects.

Q. Please describe the key elements of the CPM.

A. Key elements of the CPM include: (1) targeted and comprehensive planning studies ("CPS"); (2) pipeline prioritization modeling for distribution system replacement planning; and (3) risk and resiliency and asset assessments. The CPM prioritizes identified projects utilizing drivers appropriate for the asset investment category including safety, regulatory compliance, capacity, customer satisfaction and other drivers. Studies conducted previously may also be updated, as necessary, to assess any changed circumstances that may impact project prioritization. More detailed design engineering is conducted and implementation plans are developed for those projects that are contained in the capital investment plan.

Q. Please describe how the CPS is utilized in the CPM.

A. A CPS evaluates the distribution system, storage facilities and production capacities and is an important piece of planning for construction processes. CPSs identify projects for

construction over a fifteen-year planning horizon. Targeted studies are also completed for construction project needs that arise between CPS cycles and are evaluated, developed, and estimated to the same degree as a CPS project prior to being considered and placed within the portfolio of planned projects.

Q. Please describe MAWC's comprehensive capital planning process.

A. MAWC maintains a planning program to address the needs of each district through comprehensive studies such as a CPS. The planning process begins with the development of anticipated demand projections and regulatory requirements of the system, the identification of improvements needed to meet those demands, and the adoption of strategies to correctly prioritize and distribute capital spending for the various needs of the Company. Specific capital planning needs are addressed in both the short term (1 year) and longer term (five years and greater) and are included in the CPS developed for a respective service area. Major updates to the CPS may occur approximately every five to ten years depending on changes to system demand, regulations, facility or asset performance. Between major updates, targeted studies may be completed to address specific issues while aligning with the overall system investment plan. Recommendations from these studies are one of the parameters used to set the baseline for the preparation of the annual capital budgeting process. A key component of the planning technique is that it is flexible and can be adjusted as necessary to address new needs such as unplanned equipment failures, large or sudden growth of a service area, or a new regulatory requirement. Project prioritization is done using objective criteria that validate the need for the project and the risk of not doing the project.

MAWC prioritizes capital investment using a risk-based approach known as the Risk

Register. Through this process, identified system needs are assigned a relative rating based on the likelihood of an asset failure and consequence(s) of that failure. Projects that mitigate risks in the highest tiers of likelihood and consequence of failure, as defined by the Risk Register, are given high priority in Capital Plans.

In addition, the Company has created and implemented a geographic information systems (GIS) based prioritization model using GIS software for identifying and prioritizing pipeline replacement investments across its systems. The model prioritizes pipeline replacements through identification of service risks associated with pipe failure risks. Pipe failure risks are identified through pipe failure history, pipe material type, the decade the pipe was installed, and pipe diameter. Pipe failure history is a significant input in the pipeline replacement prioritization model. These pipe failures are identified during the Company's unscheduled pipeline replacement projects and are also identified during pipeline repair work. Pipe failures are collected and tracked in the Company's GIS system. Consequences of pipe failures, which include customer impacts, are also an input into the prioritization model. The Company also considers municipal paving schedules.

Based upon the results of the CPS and other specific needs of the service areas (such as meter replacements and other life cycle replacements) MAWC develops a proposed annual strategic capital expenditure plan (SCEP) in which capital expenditures are prioritized within the service districts and as part of a state-wide capital budget. This SCEP projects spending for specific projects and recurring expenditures for a five-year period. This capital plan is then reviewed for the reasonableness of the proposed projects and their forecasted costs. This process is repeated annually to update the SCEP to reflect any changes in need or prioritization, and to maintain a five-year forward-looking projection.

Q. Does MAWC have significant capital investment requirements?

A. Yes, MAWC's water and wastewater infrastructure investment needs are substantial. MAWC investment needs are primarily related to non-revenue producing infrastructure replacement and compliance with existing and new drinking water or wastewater standards as promulgated and enforced by the Missouri Department of Natural Resources (MDNR). MAWC's systems must comply with ever increasing and more strict regulatory requirements for drinking water (e.g. the Safe Drinking Water Act) and wastewater (e.g. the Clean Water Act), as further discussed by MAWC witness Matthew Lueders. Further, as is the case with much of the water and wastewater industry, MAWC's infrastructure is aging and in need of replacement. Aging infrastructure, pipes, plants, pumping equipment, etc., must be continually replaced so that MAWC can continue to provide our customers with safe, adequate, efficient, and reliable utility service. In addition, MAWC is working to acquire small and struggling water and wastewater systems throughout Missouri. These small systems often require significant investment to meet the basic drinking water and wastewater regulatory requirements of the State of Missouri.

Q. How do aging infrastructure replacement needs impact MAWC?

A As the largest investor-owned water and wastewater utility in Missouri, MAWC bears a considerable portion of the state's aging infrastructure investment burden. Much of the pipe, treatment, storage, supply, and other plant that are used to provide water and wastewater services are nearing the end of their life expectancy. In 2023 for example, MAWC invested approximately $346 million in improvements to keep pace with the replacement needs of its aging water distribution and sewer collection infrastructure. In 2024, MAWC plans to place in service approximately $310 million to replace aging

systems. These levels of capital investment are anticipated to continue for the foreseeable future as more of MAWC's infrastructure reaches the end of its useful life. While MAWC must continually invest in its aging infrastructure, it does so at rising costs. Costs are rising because of increasing material and labor costs, but also because the right of way restoration requirements have increased. Historical trench width plus two feet replacement requirements are now being increased to full width traffic lane pavement replacement requirements by municipalities and government agencies. As discussed later in this Direct Testimony, MAWC has invested or has planned investment of approximately $1.5 billion from January 1, 2023 through May 31, 2026. The projects I describe clearly illustrate the types of aging infrastructure issues as well as changing regulatory requirements MAWC faces.

Q What is the amount of MAWC's planned investment in this case for the replacement of water and sewer distribution and collection system assets?

A. MAWC plant additions in this case include approximately $1 billion for water and sewer distribution and collection system infrastructure asset replacements that are near the end of their useful lives. From the perspective of long-term sustainable customer service and water rates, replacing pipes that are near the end of their useful life in a systematic and responsible manner will result in lower costs to customer over time as compared with deferring needed replacements and addressing problems, such as leaks and main breaks, as they arise. Planned pipe replacements are much less costly on a unit cost basis than the costs of unplanned pipe breaks, service disruptions, property damages, and the steep increase in future pipe replacements resulting from prior deferrals of replacements.

In addition, breaks and blockages lead to unintended service disruptions, possible health

risks from potential drinking water contamination, and instances of sewer backups and property damage that can have significant impact to our customers and communities. Revitalizing the distribution and collection infrastructure installed by earlier generations is essential to meet the ongoing requirements of the communities and customers MAWC serves. Investing in the replacement of the infrastructure enhances the Company's ability to continue to meet customers' service expectations and improve health and environmental protection within the communities. In addition, the replaced areas of the system will likely be more robust and resilient during periods of high demand and storm events.

Q. Please describe the general project categories in the Company's capital investment plan.

A. The Company's capital investment plan can be divided into two distinct areas: recurring projects ("RPs" or "RP") and investment projects ("IPs" or "IP"). RPs are capital projects and programs that the Company undertakes on a regular annual basis. IPs are projects individually funded and require greater planning and scoping needs. Whether RPs or IPs, all aspects of the Company's capital program are essential to continuing to provide safe and reliable service to MAWC's customers and support the long-term viability, reliability and resiliency of the Company's water and wastewater systems.

Q. What recurring projects are included within the Company's capital investment plan?

A. MAWC's RPs include, water main installation for new development, watermain replacement and relocation projects, service line and meter setting installation and replacement, meter purchases, projects to replace and maintain treatment equipment, installation and replacement of supervisory control and data acquisition ("SCADA") equipment and systems, the purchase of tools, furniture, equipment, vehicles, and

investment in information technology equipment and systems.

Q. How does the Company determine the RP investments to include in the forecast period?

A. RP investments are trended from historical and forecasted data. Estimates are prepared for the installation of new mains and service lines, meter settings, and the purchase of new meters based on preliminary plans from the appropriate governmental planning agencies and consultations with developers, homebuilders, and engineering firms.

The purchase of tools, furniture, equipment, and vehicles is based on required needs. MAWC reviews each item independently and prepares an itemized list of expenditures. Estimates are made based on the current year pricing. The criteria for evaluating the priority of the RPs are regulatory requirements; risk and resiliency evaluations; asset condition assessments and engineering requirements; consideration of national, state, and local trends; operational and water quality needs; pipeline prioritization (as described above) and external paving/road construction plans; environmental impact evaluations; water resource management; and consideration of national trends in cybersecurity.

MAWC uses engineering criteria based on accepted engineering standards and practices that provide adequate capacity and appropriate levels of reliability to satisfy residential, commercial, industrial, and public authority needs, and provide flows for fire protection. The criteria are developed from regulations, professional standards, and Missouri-American engineering practices, policies and procedures.

Pipelines are designed to meet two conditions of service: (1) deliver projected peak hour customer demands while maintaining system pressures at 35 psi or greater in accordance with the MDNR regulations; and (2) provide adequate fire flow identified by the governing

fire authority or the Insurance Service Office Fire Ratings while maintaining distribution system pressure at 20 pounds per square inch ("psi") or greater.

Q. How are IPs included within the Company's capital investment plan?

A. IPs represent investments made to meet environmental or water quality regulations, infrastructure capacity expansion, or rehabilitation. These projects allow the Company to meet the service demands of the community, help ensure regulatory compliance, and reduce asset failure. Determining whether to include an IP within the investment plan starts with the development of the anticipated demand projections of the system, the identification of improvements needed to meet those demands, and the adoption of prioritization strategies for the various requirements of the business. Specific capital planning requirements are addressed in both the short term (one year) and the longer term (five years). Projects are prioritized using objective criteria that validate the need for a project and assess the risk of not doing the project. A key aspect of this planning technique is that it is flexible and can be adjusted as needed to address new priorities, such as unplanned equipment failures, large or sudden growth of a service area, or new regulatory requirements.

Q. How does MAWC manage capital expenditure procurement as part of its day-to-day activities?

A. All significant construction work performed by independent contractors and significant purchases are completed pursuant to a bid solicitation process. MAWC maintains a list of qualified bidders and bids project work to ensure that construction costs are kept reasonable. American Water Works Service Company, Inc. ("Service Company") annually takes competitive bids for material and supplies that are either manufactured or

distributed regionally and nationally through its centralized procurement group. The Service Company is a wholly owned subsidiary of American Water that provides services to Missouri-American and its affiliates. Through the size and breadth of American Water, MAWC has the advantage of being able to purchase these materials and supplies on an as-needed basis at favorable prices. The Service Company continues to review and undertake procurement initiatives for services and materials to reduce costs or mitigate price increases through either streamlined selection or utilization of large volume purchasing power. Initiatives that have directly impacted capital expenditures include the use of master services agreements with pre-qualified engineering consultants, national vehicle fleet procurement, and national contracts to purchase materials directly from manufacturers.

III. DESCRIPTION OF PLANT ADDITIONS

Q. Please describe MAWC's plant additions.

A. The projects that comprise the Company's plant additions in this case vary from what may be characterized as routine, recurring projects, such as the installation of individual distribution mains and service and hydrants, to substantially larger discrete projects, such as the replacement of transmission mains, safety and reliability upgrades at water production facilities, replacement of electrical switchgear and motor control centers, water storage tank projects, and system acquisition improvements, which I discuss in greater detail below.

Q. How are you presenting MAWC's plant additions in your Direct Testimony?

A. MAWC is seeking recovery of capital investments made from January 1, 2023 through the future test year proposed in this case, May 31, 2026. MAWC investment total is approximately $1.5 billion, of which approximately $409.1 million are in the future test

year period.

Q. Can you describe these plant additions?

A. Yes. I describe the significant capital projects (defined herein to include those projects with a cost of more than $1 million for water systems and $500,000 for wastewater) below. **Schedule DRL-1 – CONFIDENTIAL** provides a list of each of the projects described below along with the estimated or actual capital spend and in-service date.

Q. Do the plant additions include additional investments in water and wastewater facilities that are not specifically described in this Direct Testimony?

A. Yes. In addition to the capital projects listed below and in **Schedule DRL-1 – CONFIDENTIAL**, the Company will also enhance or maintain current levels of service, quality, reliability, and efficiency through numerous projects that do not fit within the definition of "significant capital projects" as I have defined the term above. These projects relate in part to the extension or replacement of water or wastewater distribution and collections mains, minor plant and pump satiation improvements, installation of replacement services, hydrants, and meters, and other capital expenditures such as vehicles, heavy equipment, building improvements, and computers.

Q. Please describe the significant capital investments in this case.

A. The significant RPs are as follows:

The following distribution system projects are projects that involve water main replacements due to aging infrastructure and/or water main relocations that are necessary to allow local government road authorities to construct their projects. MAWC utilizes GIS to track and analyze main break history and other relevant information such as pipe materials and age to prioritize main replacements and minimize costs. Additionally,

municipal, state or county agencies will approach MAWC with projects that create the need for MAWC to relocate our facilities, when they are in physical conflict with the agency's proposed improvements. Some examples of these projects include replacing the pavement in certain areas, adding new storm sewers, or changes that include a significant change in elevation of the road. Often such projects require relocations of the water main. Another example is the public agency will sometimes ask us to replace a water main when it has broken multiple times and they don't want it damaging their new pavement once they complete their project. MAWC will review the water main break history and if it is warranted, MAWC will replace the main as part of our replacement program, in conjunction with their project, even if it's not in physical conflict with any of the improvements I mentioned above. This cooperation allows MAWC to coordinate with local authorities to help them achieve the goals they have set and also assists MAWC in lowering restoration costs.

- MOSL_JULIAN_AVE_8"_PVC_1750_OBSL
- MOSC-Hwy K_20" Phs II Slip Line_Rep
- MOSL-Lackland_Rd-36"_CI-400'-RELO
- MOSL_MARSHALLRULE_AVE_8"_PVC_2020'_
- MOSL_AIRPORT_RD_PH1_16"_TRFLX_1180'
- MOSL_AIRPORT_RD_PH2_16"_TRFLX_1340'
- MOSL_AIRPORT_RD_PH4_16"_TRFLX_1530'
- MOSL_VICTORY_DR_PH1_8"_PVC_1550'_OB
- MOSL_CALVIN_AVE_8"_PVC_1830'_OBSL
- MOSL_LINDBERGH_PH1_12"_DI_1850'_OBS
- MOSL_AIRPORT_RD_PH3_16"_TRFLX_1650'
- MOPV_REPL_Avalon_2280_8_DI
- MOSL_LINDBERGH_PH2_12"_DI_2050'_OBS
- MOSL-WEIL_AVE_RR_BORE-12_HDPE-200-O

- MOBR_REPL_Broadway_2900LF_PVC
- MOSL_LINDBERGH_PH3_12"_DI_1650'_OBS
- MOSL_FONTAINE_PL_8"_PVC_2870'_OBSL
- MOSL_DELMAR_BLVD_8"_PVC_2350'_OBSL
- MOSL_CHAIN_OF_ROCKS_DR_8"_PVC_1350'
- MOSJ_REPL_Blackwell_DeSoto_RS_Persh
- MOSL_New_Florissant_PH3-1450'_24"DI
- MOSJ_REPL_Route_U_3520LF_CL52_840LF
- MOJC_Bald Hill Dr_8" PVC Replacemen
- MOLS_REPL_Salem/Gardner_3860LF_PVC
- MOSJ_REPL_Penn
- MOJP-Murphy 24" Replacement
- MOSL_College_Ave_8"PVC_OBSL
- MOSL-Gravois_Delores_12"-540'-HDPE
- MOJP-Moffet-Area_Main_Repl_8" DI 6200'
- MOSJ-Gene Field Rd 12" PVC 1900'
- MOWB_REPL_MO13_12"&8"DI 8500'
- MOPV REPL Mirror Lake Phase 1
- MOSJ REPL Savannah Rd

Q. Are there other significant water related capital projects included in this case?

A. Yes. The following significant capital projects are also included in this case:

- MOSL-CP_New_RDP_Lime_Slaker (I17020198)

This project adds an additional lime slaker and 4" loop piping to the A & B pre-sedimentation basins for reliability to the lime feed system. The additional lime slaker was necessary to support reliability in the lime feed system during peak demand. Loss of a lime slaker during peak demand would result in the inability to provide adequate service to our customers.

- MO River Xing to STC (Daniel Boone) (I17-020041)

The St. Charles distribution system is supplied via a single transmission main under the Missouri River. Previous failure of the existing transmission main required shut down of water supply, relying on neighboring supply for several days. Failure of this transmission main during periods of heavy demand would result in loss of water to the St Charles system for an extended duration. This project installed the 36" transmission main in the St Louis County system to the Missouri River and allows for the extension of the transmission main under the Missouri River into the St Charles system. Adding a second source of supply increases system reliability for our St. Charles County customers by eliminating a single source of potential failure.

- MOSL-Affton_#3_Roof_Replacement (I17020186)

The welded steel roof at the Affton #3 tank was at the end of its life expectancy. An aluminum dome roof was installed along with replacement influent valves.

- MOSL-CP_A_Basin_Sec_Clarifier_Drive (I17020213)

This project replaced four clarifier drives and rake arms which have reached the end of their useful life. Operable clarifiers increase treatment reliability and mitigate O&M costs by supporting more efficient routine basin maintenance.

- West High Zone Transmission Improvements A-2 (R17-04A1.24-P-0001)

The West High Zone Transmission Reliability project eliminates a single point of failure to approximately 1,000 customers in the western high zone and eliminates a hydraulic restriction in the HWY 45 transmission corridor. This project consists of installing 3,300 feet of mostly 12" pipe to connect from the end of a developer project north along Crooked

Road to connect with the existing 12” HWY 45 transmission main. This will provide a redundant 12” main while avoiding cased installation on a busy MODOT route. It is also providing a loop for the new development and can be used to feed the main zone in emergencies.

- SP Intake Reliability Improvements (I170200167)

This project enhances reliability and resiliency of this facility by mitigating the risk of flood events and installing emergency power generation. Flooding events at the South WTP's intake structures in 2015 & 2017 have increased concerns about future potential damage to the pumps and other electrical equipment as well as the intakes' overall ability to supply raw water to the South WTP during flood events. The existing intake pump station constructed in the 1950s and ancillary equipment is being replaced and moved to a higher elevation to address these concerns.

- Eureka Water Transmission Main (I17020196)

This project consists of the installation of 6.3 miles of 20” and 16” diameter transmission main within the Cities of Wildwood and Eureka in the western portion of the St Louis County service area to provide water from the Central Water Treatment Plant to the recently acquired customers in the City of Eureka. The water quality of the existing Eureka system is poor with significant total dissolved solids, hardness and taste issues. It is very hard on home appliances which leads to high levels of dissatisfaction in the water quality. Completion of this project allows for the transition of Eureka customers to the surface water source that is provided to all customers in St Louis County. Changing the source of water for the City of Eureka was the primary factor in the city resident’s approval to sell the water system to MAWC.

- CP 1 & 2 Coag Basin Improvements (I17020223)

The primary flocculation equipment in coagulation basins 1, 2 & 3 failed and was not providing mixing in the primary treatment basins. This project replaces the horizontal flocculation equipment that failed over time due to age. New vertical mixers are being installed to provide proper mixing and more efficient maintenance with access to equipment during water treatment operation.

- Eureka Arbors Dome and Coating (I17020244)

Tank inspection from November 2022 identified interior coating failure and corrosion of roof support structure of the 500,000-gallon tank. The new roof and related work associated with the tank upgrade mitigates the risk of structural failure and significantly extends the service life of the tank.

- MOSJ -Service Center Addition (I17030026)

When the St. Joseph service center was originally constructed in 2016 there were 3 service areas. Now in 2024 there are 12 service areas. This project increases the square footage of the St. Joseph service center to provide additional offices, an additional conference room, storage, and lot improvements to provide adequate space to accommodate the expanding service areas in northwest Missouri.

- Install PAC Feed Near Intake PS (I17110027)

The Shoal Creek raw water supply experiences algae events which affect taste and odor in the treated water. At the Blendville WTP, powdered activated carbon is fed to address taste and odor compounds caused by algae. Carbon is currently introduced just upstream of Sodium Hypochlorite and coagulant feed points. Due to this close proximity, higher doses

of chlorine are required due to the reaction of the carbon in the treatment process. Relocating the carbon feed point increases the carbon contact time and improves carbon utilization and performance by minimizing interactions between carbon and chlorine. This project will allow for more efficient use of chemical feeds and better optimization of the water treatment process.

- Joplin Service Center Expansion (I1711XX10)

The Joplin Service Center currently does not have enough space to store materials or vehicles inside. Materials such as meters and service materials are stored in shipping containers at the rear of the property. Additionally, vehicles are stored in the back of the building uncovered with little protection from theft. Several catalytic converters have been removed from trucks in recent years. The expansion will allow for adequate protection of vehicles and equipment along with more secure storage for meters, copper, and other materials.

- MOSL-South County Operations Center (I17020197)

Currently, several Distribution Maintenance crews and Field Service Representatives report to various remote sites around south St. Louis County. Consolidating the south county workforce to a centralized reporting area for consistency, safety, and logistics is needed to increase efficiency, training and overall workforce management. Also, several employees that will report to the South County Service Center are housed on the South Water Treatment Plant site. These employees need to be relocated to facilitate treatment improvements at the South Plant. A site in South St Louis County near the intersection of I-44 & I-270 was selected for the new service center. This allows for easy access to major highways in order to provide efficient coverage to the southern region of the service area.

It will be the reporting site for about 60 employees. The facility will include office space along with training and ready rooms for field staff. It will also include open warehouse area for material storage and a meter shop area along with meter testing equipment. Space for work vehicles, trucks and distribution maintenance equipment is also provided. Three vacuum excavator trucks will be located at this facility with indoor storage to protect from freezing environment during the winter months.

- Install New Elevated Sunset Tank (I17020068)

The existing Sunset Tank is beyond its useful life, with leakage occurring due to corrosion holes in the steel wall. This tank is used to set the hydraulic gradient for the South County Water Treatment Plant. As demands have increased over the last 90 years, the tank volume is too small and the tank volume no longer effectively supports the efficient operation of the water system. This project replaces a 250,000-gallon elevated storage tank constructed in the 1930s with a new 1.5 million gallon tank to improve system reliability by providing increased storage and more consistent pressures to customers in the area.

- JCWTP Backwash Sewer to Outfall Replacement

This project will replace the existing 14 inch diameter sewer outfall pipe from the treatment plant to the Missouri River. The existing pipe was installed in 1926 and investigation of the current pipe has revealed cracked pipe segments as well as pipe joint separation. The pipe is being replaced with a new 30" diameter pipe to carry flow from the new filter building during a filter backwash, filter to waste, and water treatment basin residuals discharge. Currently, the existing pipe can only handle one of these operations at a time. This new outfall pipe will mitigate the risk of severe failure of the existing pipe as well as allow for more efficient operation of the water treatment process.

- JFC New Filter & Chemical Feed Building (I17120015)

The Jefferson City Water Treatment Plant has served the City of Jefferson City for well over a century. This project follows a series of improvements to effectively renew the entirety of the plant with the intent of continuing to provide high-quality finished water. This project will construct a new filter building and chemical feed systems (polymer and ammonia) which will increase treatment reliability for our customers.

- NP E_Basin Prim Mix Improvement (I17020184)

This project focuses on improving the mixing of treatment chemicals in the Rapid Mix channel between the Pre-sedimentation Basin and the Primary Basin influent flume, which enhances reliability and efficiency of the system. Design and construction of a deeper rapid mix channel with a longer flume between the Pre-sedimentation Basin and the Primary Basin influent flume will improve chemical treatment processes. The current depth of the Rapid Mix channel is inadequate to effectively distribute chemicals through the full range of treatment flows. The existing shallow channel also leads to breakage of the chemical lines attached to sides and bottom of channel due to the combination of turbulence from mixer blades and high flows.

- Replace Clearwell Sluice Gates (I17100011)

This project replaces the sluice gates that are used for operation of the Mexico water treatment plant clearwell. The sluice gates are part of the original 1949 concrete clearwell and are becoming increasingly difficult to operate after 75 years. This project will replace the sluice gates, slides and frame with all new equipment along with new mechanical operators. The new sluice gates mitigate the risk of failure that would jeopardize the ability

to supply water to the customers in our Mexico system.

- CP CP3 B Substation Switchgear North Bus (I17020170)

The existing switchgear originally installed in the early 1970's is obsolete. Its operation is unreliable and replacement parts for repairs are not readily available. It also poses a risk to plant staff and will be upgraded to meet current electrical safety standards. The southern portion of the switchgear was replaced during a previous project. This project will complete the replacement of the remaining switchgear.

- CP Repl B Primary Floc Baffles (I17020177)

This project consists of replacement of the original water treatment flocculation equipment installed in 1968. The flocculation shafts, paddles, bearing support columns and baffle walls are being replaced. The new equipment provides enhanced water treatment in order to continue to meet water quality standards at the plant. Additionally, it will allow for reduced maintenance time during seasonal, routine maintenance in the basin.

- MP Chlorine Upgrade (I1702X103)

The sodium hypochlorite generators at the Meramec plant have been in service since 2008. This is well beyond the expected useful life of these units. Replacement sodium hypochlorite generators will be procured and installed to provide reliable disinfection in the water treatment process.

- MO River Crossing Bore (I17090018 & I17090020)

The St. Charles distribution system is supplied via a single transmission main under the Missouri River. Previous failure of the existing transmission main required shut down of water supply, relying on neighboring supply for several days. Failure of this transmission

main during periods of heavy demand would result in loss of water to the St Charles system for an extended duration. This project will construct the transmission main under the Missouri River and will connect it into the St Charles distribution system near Hwy 94 and Miller School Rd on the St. Charles County side of the Missouri River to connect a second river crossing for the St. Charles distribution system. Adding a second source of supply increases system reliability for our St. Charles County customers by eliminating a single source of potential failure.

- Jaxson Estates Add Well #2/Jaxson Estates Tank (I1709XXX6 & I17090021)

The existing tank is a bolted steel standpipe. The bolted seams are showing rapid signs of corrosion and need replacement. Operational challenges exist due to higher levels of iron in the source water and tank turnover is difficult when the tank is operated to the full volume. Without adequate turnover, iron residuals accumulate in the tank resulting in water quality complaints. Additionally, due to growth in the area, the tank needs to operate at a higher gradient to provide minimum service pressure. This project replaces the existing standpipe with a 200,000 gallon elevated tank in order to increase service pressure, provide adequate fire protection, and improve water quality in the system through full use of the tank storage volume. With continued growth in that area, a second source of supply is planned for the new tank site, and a second well at the new tank site or connection to neighboring water system will provide redundancy for the community.

- I-49 City of Joplin ARPA Main Extension Partnership (I17110031)

The City of Joplin applied for American Rescue Plan Act (ARPA) funds and were awarded $5M in matching funds for water main extensions. Missouri-American Water Company was named as a sub recipient for the ARPA funds. Three targeted areas have been selected

in the Joplin area which are not currently served by a public water system. While no evidence of contamination is shown in the targeted service areas, the Springfield aquifer is known to have metals contamination, including lead, cadmium, and tetrachloroethylene (TCE) due to historic mining and manufacturing activities. Additionally, these households also do not have access to fire protection which creates a safety risk for these residents. Approximately 22,000 ft of 12" DIP is scheduled to be installed to bring safe and reliable water service to the residents in this area.

- Eureka Transmission Main Extension (I1702XX90)

This project will install 12" main within the distribution system in order to better fill the Arbors and Viola tanks during peak summer demand. Hydraulic modeling has shown that during peak usage, customer demands above 3 mgd, the piping on the north side of I-44 west of the new transmission main is undersized to adequately fill these tanks. This new 12" main will reduce the headloss during peak demand allowing for tank fill during the high usage periods.

- Joplin WTP CO2 Feed System (I1711XXX7)

This project includes pH adjustment at the Blendville Water Treatment plant in Joplin. Blendville is a surface water treatment plant. A combination of the higher pH of the source water and the added pH from water treatment methods causes the pH to be close to the upper pH target range for optimum coagulation and finished water quality limits. Missouri DNR has allowed MAWC to perform a pilot project. This pilot project will be performed by plant personnel with Olsson Engineering providing a supporting role. This project consists of installing a new Bulk CO2 tank, CO2 feeders for each treatment train at the plant, along with associated controls system. With the installation of the new system, the

plant operator will be able to control pH as required to maintain optimum water treatment.

- Chlorine to Hypo Conversion - Wells Ph 3

This project will replace the chlorine gas and ammonia chemical feed systems at the Joplin well facilities. This project includes conversion of the gaseous chlorine and ammonia at 7 well sites to liquid sodium hypochlorite and liquid ammonium sulfate (LAS). Chlorine gas can be a safety hazard for employees and the public. As the Company evaluated its risks it identified gaseous chlorine as a potential serious health hazard to its employees and the larger community. Accordingly, to eliminate this safety concern, the Company is investing in this conversion. Eliminating the use of gaseous chlorine at the facility eliminates the dangers of an accidental release of the toxic gases or a deliberate attack that would pose a danger to the public and the Company's operations staff if this event occurred. In addition, Well 5, 7, 8, 9, 10, 11 and the Galena Pump Station well will have new chemical feed pumps, piping, and tanks. Also included in this is general rehab of the well buildings and updates to SCADA controls.

- Purcell Water Tower (I17650001)

The existing Purcell water tower is 50,000 gallons, was constructed in 1911 and is a riveted steel tank that utilized a wax and oil interior coating. The tower has some missing rivets in the roof and had to be patched on the lower bowl area in 2022 due to a leak through the steel. During the repairs it was noted that the steel was thin in several areas around the patch. The average daily demand on the system is approximately 88,000 gallons per day and this tower also provides for fire flow. A new 100,000-gallon steel tank will be erected adjacent to the existing tank to provide reliable storage and fire flow. The tank will also be elevated an additional 20 feet to improve pressure to the higher elevations in the system.

- NP East Intake Chemical Feed Vault (I17020227)

The existing discharge header and chemical feed vault/piping are original to the plant (1963), corroded, and warrants replacement to mitigate risk of failure. This project will provide for more efficient operation and timely maintenance of the chemical feed system, and provide a safe and reliable means to access the discharge header at the intake structure. This project consists of replacing the 36 inch raw water discharge header, pump discharge valves, chemical feed injection points, installing a man access door in the intake structure, replacing and rerouting the raw water sample feed lines to flow to the main control building.

- CP A Intake Switchgear & Transformer Replacement (I17020251)

The existing switchgear and transformers were installed in the early 1970's and have reached the end of their service life and are obsolete. When maintenance is needed or failures occur, replacement parts for repairs are not readily available. Also, safe operation of the aging equipment will be addressed. Switchgear and transformer replacement will increase operational reliability and bring it up to current electrical standards.

- CCP Storage, shop, office, bldg addition (I17020089)

The existing shop building was built in the 1920's and is no longer capable of meeting all the needs of Central Plant maintenance and repair operations. Due to the age of the building, it is suspected many surfaces would test positive for lead and asbestos. A new shop building is needed to meet current needs and reduce the exposure risk to workers. This project will mitigate health and safety aspects of the existing facility. In addition, it will provide a new machine shop and will allow for a consolidated reporting location of

the maintenance personnel at the plant. Currently there are multiple reporting sites within the plant grounds for shop mechanics. This project will provide for more efficient supervision of staff by consolidating shop maintenance personnel at one facility within the plant.

- STJ 12-inch MO River Crossing to Levee Phase (I17032019)

The single 16-inch main crossing the Missouri River to serve City of Elwood, Wathena, and Rosecrans AFB is a single point of potential failure and there are no interconnects with other systems on the west side of the river to supply these customers if the river crossing pipe fails. This project will provide a second parallel main across the river to provide a redundant supply to these customers, improving reliability and resiliency of service.

- 36" Main - Long Rd to Spirit of St Lous Blvd (I17020234)

This project will complete the 36" transmission main being installed as a second source of supply to the St. Charles service area. This main will connect into the 42" main in the St Louis County system on the east end near the intersection of Long Rd and Chesterfield Airport Rd. It will tie into the existing 36" main on the east end near Spirit of St Louis Blvd and Chesterfield Airport Rd. The 36" main will provide reliability to the St Charles system and mitigate the single point of failure risk that exists with the current river crossing serving the St. Charles system.

Q. Are there other significant wastewater related capital projects included in this case?

A. Yes. The following significant capital projects are also included in this case:

- MOW2-Incline_Village_WW_#1_Replacem (I17150002)

This project is necessary to replace the aging WWTF with a new treatment plant to provide

adequate capacity for the area served. Permitted flow at this facility is 80,000 gpd. Originally, two parallel treatment plants, 20,000 gpd and 60,000 gpd, were in operation at this facility. These treatment plants at this facility have reached the end of its design life. The 20,000 gpd train was deteriorated significantly and was taken offline, and the actual flows are greater than the design flow of the existing 60,000 gpd treatment plant Incline Village WWTF. The new facility will consist of a mechanical activated sludge plant, sized appropriately for the total 80,000 gpd service area, thereby helping ensure compliance with the permitted effluent limits.

- MOM1-_Influent_Scrn_Incl_Washer_Com (I17300002)

This project was the reconfiguration of the headworks of the Meramec WWTF to replace the manual bar screen with an automated mechanical screen. The screen includes a washer and compactor for disposal of the screened solids. Installing the screen benefits the treatment process by screening out inorganic solids before the biological treatment process. The exiting bar screen allows for the passage of disposable wipes and other inorganic material causing significant operational challenges, including unsafe conditions for the operator while removing debris and trash from the WWTP.

- MOS4 REPL CCTV/Lining (R17-69B1.23-P-0002)

This project cleaned and collected closed-circuit television (CCTV) footage of the entire gravity collection system of Stewartsville, MO. This allowed us to identify target areas for future lining and necessary point repairs. 3388 LF of 8” gravity sewer main was lined during this project, that was identified as the highest priority.

- Emerald Pointe WW Lift Station (I1756XXX1)

This project includes the installation of a wastewater lift station in Phases IX and X in Emerald Phases IX and X are ready for development, with builders under contract to construct new homes. The sewer lines were installed previously and acquired as part of the Emerald Point acquisition.

- Eureka WW Hilltop LS (I17600005)

The Hilltop Lift Station was identified for replacement during the acquisition of Eureka wastewater system. The pumps and other equipment posed a confined space hazard for operation staff at the existing lift station due to pumps and equipment being in a dry well. The proposed project included installation of a new conventional wet well lift station with a vertical valve vault, pumps, control panels, manhole, and reinforced concrete wet weather storage pipe. The new lift station eliminates the current confined space hazard and will reduce the frequency of service and repairs for lift station equipment.

- Eureka WW Collection System Imp 2024 (R17-60B1.23-P-0006)

CCTV inspections conducted in 2023 identified over 10,000 ft of sewer pipelines with defects requiring replacement. This project involves cured-in-place-pipe (CIPP) installation to reduce inflow and infiltration (I/I) entering the Eureka collection system. Reducing the collection system I/I during rainfall events reduces the risk of sanitary sewer overflows at the plant. It also eliminates the need for capacity increases associated with I/I.

- Incline Village Wastewater Plants #2 Expansion (I17150001)

This project is necessary to meet capacity demands for the area served and to replace the aging facility to meet permit effluent limits. This facility has reached the end of its design

life, and the actual flows are greater than the design flow of the existing WWTF. The original design capacity permit for this facility was 80,000 gpd. Similar to Incline Village WWTP #1, there were two treatment trains at this facility (60,000 gpd and 20,000 gpd). The 20,000 gpd was taken offline due to deteriorated condition. Incline Village #2 service area has also grown beyond the original 80,000 gpd operating permit level. The new facility is permitted by MDNR for 120,000 gpd and will consist of a mechanical activated sludge plant sized appropriately for the service area, thereby allowing for compliance with the permitted effluent limits.

- Churchview (I1727XXX2)

This project consists of the construction of a pump station and force main to transport the received wastewater to the Wardsville NW WWTF. The new Churchview WWTF permit has chloride limits that will be difficult to meet, therefore the pump station and force main is necessary to ensure compliance is maintained. This will also reduce operation and maintenance costs with the elimination of a WWTF.

- Calley Trails-Stoney Creek WWTF AOC (I17270014)

The existing Calley Trails and Stoney Creek WWTFs cannot meet the permitted ammonia limits. In addition, the MDNR has developed an AOC for the Stoney Creek WWTF to meet ammonia limits. This project is designed to comply with the terms of the AOC. The new mechanical facility will be located at the Calley Trails WWTF and will be sized appropriately to handle the wastewater from both facilities. The Stoney Creek WWTF will be closed and replaced with a pump station and force main to transport the waste to the new Calley Trails WWTF.

- Ozark Meadows Plant Upgrade (I1727XX10)

This project will replace the Ozark Meadows WWTF, which is a metal package plant and has reached the end of its life. The existing plant is experiencing significant corrosion and is at risk of failure, which would result in leakage of wastewater into the surrounding soil. The new facility will be a mechanical plant constructed of concrete basins and will meet the permitted effluent limits.

- Cedar Hill Lagoon Influent Screen (I1707XXX3)

Currently, there is no influent screen at the head of the Cedar Hill Lagoon Treatment Facility. This creates operational challenges with flushable wipes and other inorganic material in the system. This project will install a new influent screen at the head of the Lagoon in order to remove inorganic material which will improve operation of the facility.

- Eureka WW KOA LS (I17600004)

The Kampgrounds of America (KOA) Lift Station was identified for replacement during the acquisition of Eureka wastewater system. The pumps and other equipment posed a confined space hazard for operation staff at the existing lift station due to pumps and equipment being in a dry well. The proposed project includes the installation of a new conventional wet well lift station with a vertical valve vault, pumps, control panels, and manhole. The new lift station eliminates the current confined space hazard and will reduce the frequency of service and repairs for lift station equipment, improving safety, reliability and efficiency.

- Eureka WW Kircher (I17600008)

The Kircher Lift Station was identified for replacement during the acquisition of Eureka

wastewater system. The pumps and other equipment posed a confined space hazard for operation staff at the existing lift station due to pumps and equipment being in a dry well. The proposed project includes the installation of a new conventional wet well lift station with a vertical valve vault, pumps, control panels, manhole, and reinforced concrete pipe (RCP) storage. The new lift station eliminates the current confined space hazard and will reduce the frequency of service and repairs for lift station equipment improving safety, reliability and efficiency.

- Wardsville NW WWTF Ammonia Upgrade-AOC (I17480005)

This project upgrades the existing Wardsville NW WWTF, and creates a regional treatment facility. There will be a total of 5 WWTF closed with the collection systems pumped to the Wardsville WWTF. Markway Meadows and Churchview will be completed with this project. Kleffner Ridge, VanLoo, and Coyote Ridge WWTFs will be done at a later date. An Aero-Mod SEQUOX Biological Nutrient Removal System with a design flow of 251,410 gpd will be constructed. The process uses activated sludge and has 2 stages of aeration with logic controlled sequences of aeration and no-aeration, throughout the biological process. The process allows for BOD removal, nitrification and denitrification. An existing lagoon cell will used to provide flow equalization. The existing UV disinfection system will be upgraded to serve the new peak design flows. This project is designed to comply with the terms of the AOC.

Q. Are there significant Enterprise Solutions related capital projects included in this case?

A. Yes. The following significant capital projects are also included in this case:

- Meter Data Management System (MDMS) (T17-014A-P-0001)

The MDMS is a portal that ingests advanced metering infrastructure (AMI) meter reads directly from the head end systems designed to address data security, privacy and cyber security standards. This is an upgrade to legacy meter data management software and integration with SAP to improve meter data accuracy and leak detection. MDMS helps manage the AMI meter reading process by receiving AMI data, and monitoring for missing data or incomplete data. This improves meter data accuracy and customer billing by providing more timely data that helps address exceptions to the meter reading process that occur from time to time. Implementation of this software can provide insight into potentially malfunctioning meters in the field, enable more effective field operations and meter exceptions. Customer billing accuracy is improved by providing better reporting to support meter exception management.

- MDMS: Release 2 (T17-014A-P-0003)

This project further developed and enhanced the MDMS through integration with Neptune headend systems along with new enhancements and features. These new enhancements include development of interval meter data pipeline, enhanced cyber security and role provisioning, and development of automated customer service features, including move in/out capability and high bill inquiry. This project improved customer experience through increased insight into daily water usage, greater billing accuracy, and enabling more proactive identification of high and estimated billing conditions.

- myWater V2 Enhancements 2023 (T17-014D-P-1000)

As discussed by MAWC witness Jody Carlson, MyWater is a customer facing website, which provides for self-service options and more seamless discussions between Company representative and customers. This project made enhancements to MyWater, including

developing new features and enhancements focused on improving the customer experience through presentment of AMI interval meter information, enablement of automated pay features, and development of workflows ensuring consistent new customer transactions. Additional features in-serviced included usage analytics and enhanced cyber security features.

- Data Center Replacement (T17-0100)

This project involves the replacement of American Water's existing data center currently serving American Water and its regulated affiliates (including MAWC) that is necessary to operate and store software applications and associated data digitally. The Company has historically leased space for its data centers, with its primary facility provided by IBM/Kyndryl in Sterling Forest, New York. IBM/Kyndryl informed the Company that its data center location and infrastructure has reached end-of-life. As a result, the data center lease would not renew for the primary data center, requiring the Company to exit the facility by October 31, 2025 and pursue another alternative for its data center applications.

Q. Does this conclude your Direct Testimony?

A. Yes.

Schedule DRL-1 has been marked CONFIDENTIAL in its entirety in accordance with Commission Rules 20 CSR 4240-2.135(2)(A).4 and 20 CSR 4240-2.135(2)(A).6.