MISSOU
WASTEWATER TREATMEN

Missouri River Wastewater Treatment Plant (MRWWTP) Improvements Project was identified as an early action project in the Combined Sewer Overflow (CSO) Long Term Control Plan. Improvements are needed to treat a higher flow rate of combined sewage during wet weather events and provide separate treatment of industrial wastewater to keep contaminants out of the Missouri River. Improvements will allow the MRWWTP to accept and treat up to 150 million gallons per day. This is accomplished through a combination of new facilities and maximizing the use of existing facilities.

Although the MRWWTP Improvements Project is designed to treat wastewater, other CSO projects are needed to deliver wastewater to the plant for treatment. It is estimated that treatment and conveyance projects working together will reduce *E. coli* loading to the River by approximately 50%. The $140M expended at the

RIVER
T PLANT IMPROVEMENTS

MRWWTP provides a substantial return on investment in terms of *E. coli* reduction.

SOUTH OMAHA INDUSTRIAL AREA TREATMENT AND CAPACITY (SCHEDULE A)

The South Omaha Area Industrial Area (SOIA) improvements are part of a larger plan designed to separate industrial waste (primarily meat packing waste) from the storm water system. Industrial wastewater is now separately conveyed and treated. New preliminary and primary treatment facilities were constructed to treat this wastewater before being treated by the plant's secondary treatment process. This prevents this wastewater from being discharged to the river during wet weather, as was occurring previously. Separate treatment of high-strength industrial wastewater from the SOIA has resulted in a significant reduction (approximately 26%) in *E. coli* discharged to the River by CSOs and the MRWWTP.

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The SOIA system was designed to keep fats, oil and grease (FOG) in solution until it could be removed by two clarifiers. Every unit process is covered and ventilated allowing odorous air to be transported to odor control. A two stage biofilter removes odorous compounds before discharge. This project cost approximately $20M and was completed in 2014.

PRELIMINARY AND PRIMARY TREATMENT IMPROVEMENTS (SCHEDULE B1, B2)

Schedule B1 replaced 50+ year old north and south inlet headworks facilities with a new municipal headworks facility. Improvements include flow measurement, screening, grit removal, odor control, in-plant lift station improvements, splitter box rehabilitation, and clarifier and pump house improvements. The project also included an air gap structure to isolate primary from secondary flows and a flood control seepage barrier for high River events. The B1 project cost approximately $62M and was substantially complete and put into service in early 2016.

As part of Schedule B2, new facilities are being constructed to disinfect using chlorine the portion of the flow during wet weather that does not receive full secondary treatment, and to remove any unused chlorine to protect aquatic life in the River. This facility will be able to receive a peak hour flow rate of 101 million gallons per day. This approach manages the first flush of high-ammonia wastewater through storage in wet weather clarifiers and allows for more diluted wastewater to be treated. This keeps ammonia concentration to an acceptably low level as it enters the chlorine contact basin to maximize the effectiveness of the chlorine disinfectant. The B2 project is over 50% complete and is scheduled for completion in May of 2019. Construction cost will be about $51M.

BANK STABILIZATION IMPROVEMENTS

In 2011, the City of Omaha experienced record flooding on the Missouri River. This resulted in significant quantities of sediment being deposited along the River bank in the area of the MRWWTP where Schedule B2 facilities needed to be built. In spring 2013, a significant portion of the river bank had rotational failure and bank sloughing.

The project team researched multiple bank stabilization options. Stabilization was accomplished by mixing existing soil with cement to create columns with a strength of 100 pounds per square inch or greater. Soil was mixed in a way that allowed cement to be pneumatically placed in a column as the mixing tool was drawn up to the surface. Columns were connected to a stable material below ground. Columns were placed in 20 foot long walls that run perpendicular to the River. Each wall has nine columns. Over 2000 columns were constructed using over 8,000,000 pounds of cement. The project was substantially complete in early 2017 and Schedule B2 facilities are now being constructed in the stabilized area while other treatment plant facilities are also being protected.