



City of Lawrence

2018 MUNICIPAL SERVICES & OPERATIONS REPORT INTEGRATED MUNICIPAL WASTEWATER PLAN MEMORANDUM OF UNDERSTANDING

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I. Overview

On June 5, 2012, the Environmental Protection Agency (EPA) published its Integrated Stormwater and Wastewater Planning Approach Framework for the purpose of assisting “*municipalities on their critical paths to achieving the human health and water quality objectives of the Clean Water Act by identifying efficiencies in implementing requirements that arise from distinct wastewater and stormwater programs, including how to best prioritize capital investments*” (Framework).

In July 2012, in consultation with Burns & McDonnell and BG Consultants and following detailed assessment of wastewater infrastructure and future needs, the City of Lawrence, Kansas (City) developed its Integrated 2012 Wastewater Utilities Plan (Integrated Plan) detailing a scope and implementation schedule for infrastructure improvements, enhancements and expansion. The Integrated Plan addresses the City’s wastewater capacity, management, operation and maintenance. It further contains an inflow and infiltration reduction program to correct sanitary sewer deficiencies on a prioritized, site-specific basis. In addition to the Integrated Plan, City staff prepared reports on water and wastewater capital improvement plan options and the revenue requirements, annual field maintenance operations, and the capital improvement program.

In January 2014, on advice from and in consultation with the Kansas Department of Health and Environment (KDHE) and following Integrated Plan modifications consistent with Framework goals, the City and KDHE executed a 20-year Memorandum of Understanding (MOU) providing for *inter alia*:

- Adoption of the Integrated Plan as the Initial Integrated Municipal Wastewater Planning document and core document for future modifications.
- Incorporation of the Integrated Plan into the NPDES Permits (Permits) for the Lawrence Kansas River Wastewater Treatment Plant (Kansas WWTP) and the Wakarusa River Wastewater Treatment Plant (Wakarusa WWTP), with provision for Integrated Plan review and modification at each five-year Permit renewal.
- An implementation schedule reflecting the parties’ best estimate of improvement projects and respective start dates (Attachment 1).
- Annual City updates on Integrated Plan progress.

This Report provides information about Integrated Plan progress in 2018 and planned activities for 2019. The Report also contains updated information about MOU Attachment 1 and Permits. The below-identified projects are contained in or responsive to Attachment 1. Work continues in 2019 for those projects still in progress, with new projects being identified on an ongoing basis through system assessment.

Between 2014 and 2016 the City of Lawrence completed sanitary sewer flow monitoring and data analysis at 11 locations around the University of Kansas (KU) campus to define the existing base, inflow and infiltration flow rates into the City’s sanitary sewer system. Since it is impractical to perform flow monitoring at all 38 KU connections to the City’s system, the 11 flow monitors isolated approximately 60% of KU’s service area into 9 basins with varying development age and pipe material. Results from the data analysis showed wet weather flow rates that ranged from similar to the City system in the Western Districts to as much as 4 times higher in the North District. Flow monitoring results were shared with KU each year, extrapolated across all of KU’s service area. KU used the results to develop and prioritize a phased sanitary sewer collection system inspection, rehabilitation, and improvement program. A program summary and timeline are discussed in Section IV.

City of Lawrence Municipal Services and Operations (MSO) include Stormwater management and Farmland Remediation operations. The City of Lawrence intends to pursue inclusion of many regulatory environmental requirements into the Integrated Plan and under a common management system. This would include pertinent legal requirements for all City held permits and legal responsibilities related to the Farmland Remediation project as well as MS4 Stormwater permits and plans. It is anticipated that the current Integrated Plan’s MOU and associated permits will need modification over time. Additional information is contained in Section V and VI.

II. Progress Update

UT1304 Wakarusa WWTP and Conveyance Corridor (Attachment 1, Item 2a)

<p>Project Description</p>	<p>Design and construction of the new Wakarusa River Wastewater Treatment Plant (Wakarusa WWTP), the new Pump Station 10, related force mains, and improvements to the existing Kansas River Wastewater Treatment Plant (KS River WWTP). This project provides a second wastewater treatment plant and enhanced operational flexibility, with pump station functionality to divert flows between treatment plants as needed to meet changing operational needs. The project provides for future community growth, meets the regulatory requirements for wet weather treatment and nutrient removal and increases system reliability and resiliency in transporting and treating wastewater without negatively impacting the community or the environment.</p>
<p>Design Engineer</p>	<p>Black & Veatch/PEC/Bartlett & West</p>
<p>Contractor</p>	<p>Garney Construction (Wakarusa WWTP, Pump Station 10, KS River WWTP Improvements), Kings Construction (Site Fill) and BRB (Force Mains)</p>

Status	Garney construction contract in 1-yr warranty period; Wakarusa WWTP Maintenance Building to be constructed in 2019
Project Budget	\$74.1 million (Completed - \$72.2 million)
Project Details	<p>In 2014, after eight years of planning, design and preliminary improvements, the project moved into the construction phase beginning with site fill placement and installation of force mains. In addition to the contractors identified, qualified department staff performed various inspection services; designed the automation, integration and programming systems; installed pipeline, and acquired various equipment as cost-saving measures and for enhanced in-house operational knowledge of new infrastructure functionality.</p> <p>KS River WWTP Improvements – Laboratory expansion started in late 2015 and completed in August 2016. Facility improvements also included final clarifier equipment replacement.</p> <p>Wakarusa WWTP and Pump Station 10 – Construction began in June 2015 and concluded in June 2018. Substantial completion and start-up took place in March 2018. The facilities are currently in the one-year warranty period. Construction was completed on schedule and under budget.</p>

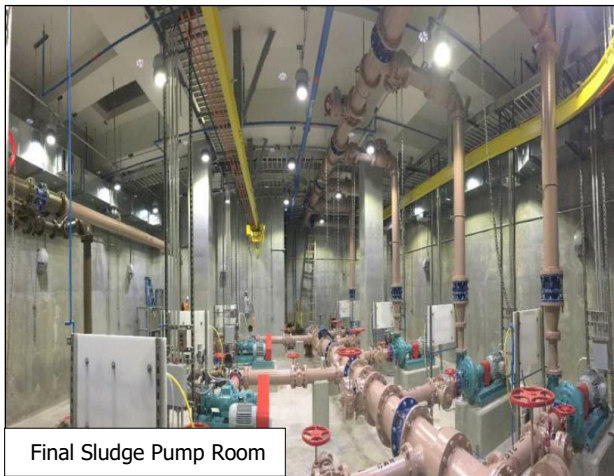




BNR Basin



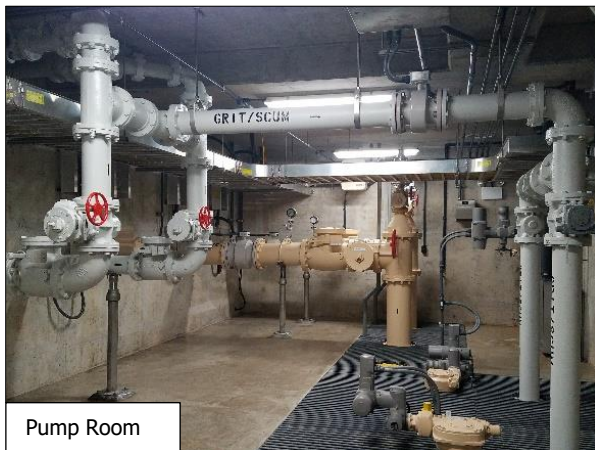
Aerial View



Final Sludge Pump Room



Lab



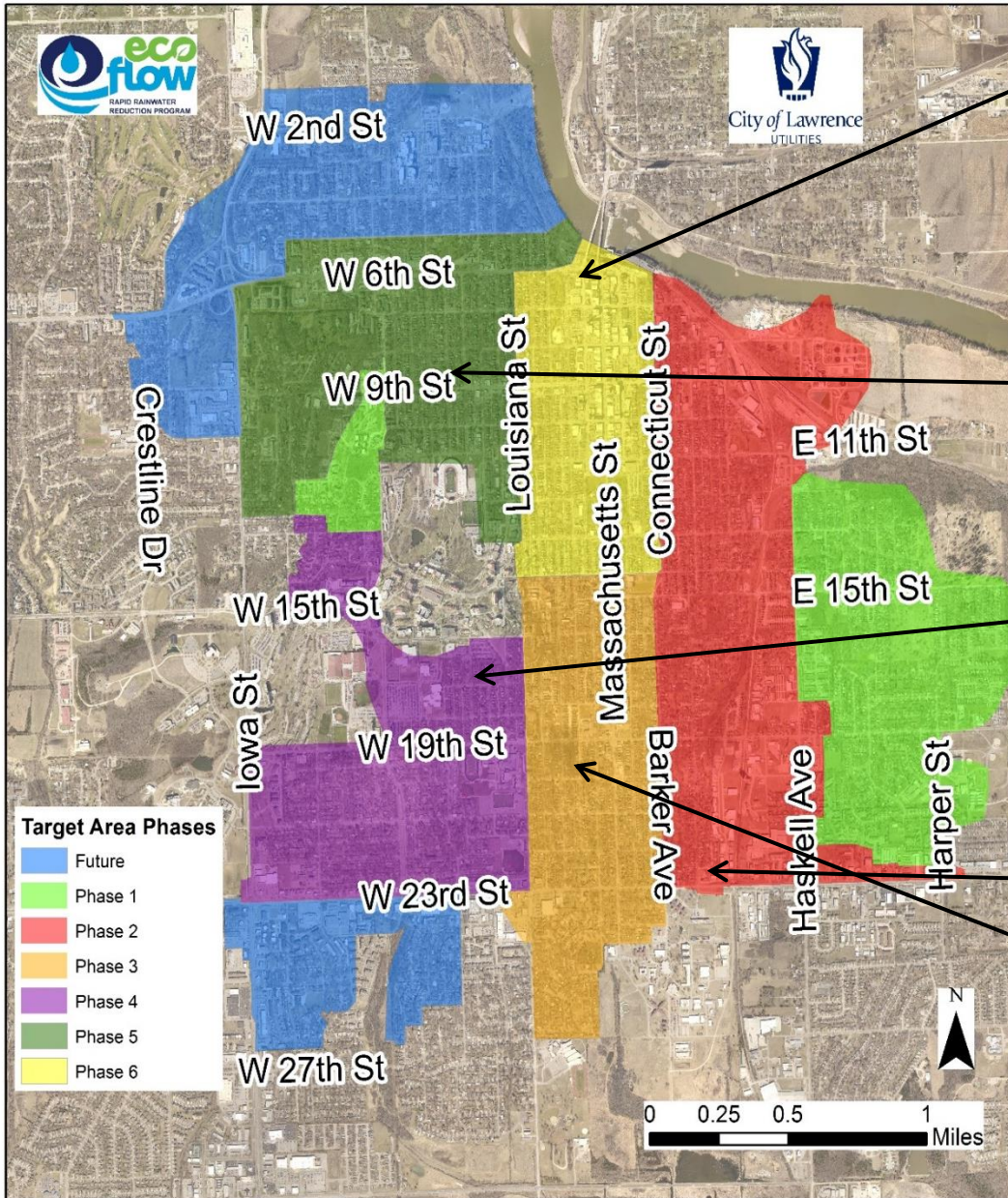
Pump Room



Pump Station 10

UT1305 – EcoFlow: Rapid Rainwater Reduction Program

Project Description	Comprehensive, multiyear, multiphase, “find and fix” program to investigate and reduce rainwater entering the City’s sanitary sewer system from public and private sources. EcoFlow targets discrete geographic areas inside City limits, with six Phase areas identified to date and phasing of the future areas based on data from ongoing flow monitoring. The map below shows 2018 activities and 2019 scheduled activities. Public feedback and participation rates continue to be overwhelmingly positive.
Design Engineer	TREKK Design Group
Contractor	Eight Pre-qualified Plumbing Contractors & City Staff
Status	Initial Program scope to complete 2020, with ongoing evaluation/correction of to-be-identified future areas.
Project Budget	Original 2018 CIP Budget (UT9909CIP): \$2,830,000 2018 CIP Budget Transferred to Related Projects: \$1,050,000 2018 Budget: \$1,780,000 2018 Spent: \$1,713,954
Project Details	<p>Public sector investigation activities completed in 2018 included 377 manhole inspections, approximately 59,000 linear feet of sanitary sewer smoke testing, and approximately 5,000 linear feet of closed-circuit television (CCTV) sewer inspections. Completed public sector sewer repairs included 93 sanitary sewer point repairs, and approximately 67,000 linear feet of cured-in-place pipe (CIPP) rehabilitation. An additional 41,000 linear feet of sanitary sewer is currently under contract to install CIPP in this area as part of the larger Citywide project UT1807. A total of 337 manholes are currently under contract to be rehabilitated using various types of methods as project UT1710. Repairs are ongoing and that project is scheduled to be completed in February 2019.</p> <p>Private sector activities completed in 2018 included over 900 private property evaluations. Of the defects identified, department staff repaired approximately 25 minor defects and EcoFlow plumbing contractors repaired 422 defects. Private sector investigations are planned to continue throughout 2019, targeting Phase 6 in the map below.</p>
Related Project	<p><u>UT1705 – 2017 CIPP Sewer Rehabilitation</u> <u>UT1807 – 2018 CIPP Sewer Rehabilitation</u> <u>UT9909CIP – Rapid I/I Reduction Program</u></p>



PHASE 6
 Completed

- Smoke Testing

Ongoing

- Private Property Investigations & Repairs

PHASE 5
 Completed

- Private Property Investigations & Repairs
- Public Sector Investigations

Scheduled (2019)

- Main Sewer Public Sector Repairs

PHASE 4
 Ongoing

- Main Sewer Public Sector Repairs (UT1807)

Scheduled (2019)

- Manhole Rehabilitation

PHASE 2
 Ongoing

- Manhole Rehabilitation (UT1710)

PHASE 3
 Completed

- Main Sewer Public Sector Repairs (UT1705)

Ongoing

- Manhole Rehabilitation (UT1710)

Scheduled (2019)

- 23rd and Massachusetts St Sewer Replacement (UT1805)

UT1705 – CIPP Sewer Rehabilitation - 2017

Project Description	Sewers are identified for rehabilitation through various assessment programs, including EcoFlow and CCTV inspection by city crews, based on such factors as existing defects, pipe age, pipe material, depth and ground conditions. The CIPP rehabilitation method lines the inside of old, vitrified clay pipe sanitary sewer mains – a more cost-effective rehabilitation method than open-trench excavation and replacement.
Design Engineer	City Staff
Contractor	SAK Construction (CIPP Installation) and Vito's Plumbing (Point Repairs)
Status	Project Completed in April, 2018
Project Budget	\$2,026,058 (Total), \$1,309,668 (CIPP), \$716,390 (Point Repairs),
Project Details	CIPP rehabilitation of approximately 46,500 linear feet of sanitary sewer ranging in size between 8 inches and 24 inches in diameter. A total of 101 public sector point repairs were completed on the sewers associated with this project since the start of 2016. The project area is throughout the City with a focus on Phase 3 of the Rapid I/I Reduction Program.
Related Projects	UT9909CIP – Rapid I/I Reduction Program UT9908CIP – Clay Pipe/Manhole Rehabilitation



UT1710 – 2018 Manhole Rehabilitation Project

Project Description	The project will rehabilitate 337 sanitary sewer manhole structures throughout the City with a focus on the Phase 2 and Phase 3 Ecoflow Areas. The purpose of the project is to reduce the amount of rain and groundwater entering the sanitary sewer system and extend the useful design life of older structures with significant hydrogen sulfide (H ₂ S) degradation.
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Design Engineer	City Staff
Contractor	Utility Solutions, LLC
Status	Project Completion February 2019
Project Budget	\$600,000 (Completed - \$118,773)
Project Details	The rehabilitation work includes 184 frame/cover replacements or realignments, 230 manhole linings/coatings with various materials, and grout sealing 26 manholes.
Related Project	UT9909CIP – Rapid I/I Reduction Program UT9908CIP – Clay Pipe/Manhole Rehabilitation



UT1802 – Manhole Replacement Project

Project Description	The purpose of this project is to add or replace manholes on existing sanitary sewers with limited access, blind turns, blind connections, and other atypical situations. Currently, City Staff is not able to complete standard maintenance activities, inspect or rehabilitate the sewers in these areas due to limited access.
Design Engineer	BG Consultants
Contractor	TBD
Status	Project Completion Fall 2019
Project Budget	\$278,000 (Completed – \$38,186)
Project Details	There are 12 separate sites currently included in the scope of this project. Most of the sites are located north of KU's campus and west of Downtown. Each of the 12 locations will have a site specific design in order to improve the atypical situations. The improvements will include adding or replacing manholes and relatively minor pipe improvements.
Related Project	UT9909CIP – Rapid I/I Reduction Program

UT1805 – 2300 Block of Massachusetts Sanitary Sewer Replacement Project

Project Description	The purpose of this project is replace the existing 6" sanitary sewer with a new 8" sewer for the 2300 Block, between Massachusetts Street and Vermont Street.
Design Engineer	BG Consultants
Contractor	TBD
Status	Project Completion Fall 2019
Project Budget	\$623,000 (Completed - \$32,936)
Project Details	The sewers included in this project have a history of causing basement backups and other maintenance issues. Since the existing sewer is only 6" in diameter, compared to the currently required 8" diameter, City Staff are not able to complete CCTV inspection in order to determine the existing structural condition. In addition, the limited size of the sewer eliminates the possibility of using CIPP for rehabilitation. City staff believes this infrastructure has degraded and there is a likelihood of failure at some point in the future.
Related Project	UT9908CIP – Clay Pipe/Manhole Rehabilitation

UT1807 – 2018 Sanitary Sewer Rehabilitation CIPP Project

Project Description	Sewers are identified for rehabilitation through various assessment programs, including EcoFlow and CCTV inspection by city crews, based on such factors as existing defects, pipe age, pipe material, depth and ground conditions. The Cured-In-Place-Pipe (CIPP) rehabilitation method lines the inside of old, vitrified clay pipe sanitary sewer mains – a more cost-effective rehabilitation method than open-trench excavation and replacement.
Design Engineer	City Staff
Contractor	SAK Construction (CIPP Installation) and Vito's Plumbing (Point Repairs)
Status	Project Completion Spring 2019
Project Budget	\$2,147,441 (Total), \$1,647,441 (CIPP), \$500,000 (Point Repairs)

Project Details	<p>CIPP rehabilitation of approximately 63,600 linear feet of sanitary sewer pipe ranging in size between 8 inches and 15 inches in diameter. A total of 51 public sector point repairs have been completed on the sewers associated with this project. It is anticipated that an additional 10-15 point repairs will be required to complete the project.</p> <p>The sewers included in this project are located throughout the City with a focus on the Phase 4 Ecoflow Area and the Sunset Hill Neighborhood</p>
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UT1892CIP – Naismith Valley Interceptor and Pump Station 8 Abandonment

Project Description	The Naismith Valley Interceptor and Pump Station 8 (PS 8) Abandonment project includes construction of a gravity sewer to intercept flows currently entering PS 8 and convey them south to Pump Station 10 (PS 10). The project also includes abandonment of PS 8 and associated piping located at 2233 Alabama St.
Design Engineer	Black & Veatch
Contractor	To Be Determined
Status	Currently in Design Phase, Project Scheduled for Completion in May 2020
Project Budget	\$4,610,000 (Completed - \$47,131)
Project Details	The Naismith Valley Interceptor and PS 8 Abandonment project will include construction of approximately 7,500 linear feet of 18-inch to 36-inch interceptor sewer from PS 8 to the connection with the Lower Naismith Interceptor project completed in 2017.
Related Project	(UT1812 – Department Project Number)

UT1884CIP – MSO Field Operations Facility

Project Description	City Field Operations and Maintenance facilities are currently in 18 decentralized facilities which presents numerous challenges including insufficient space for existing and future operations, duplication of facilities, functions, and staff roles, and lack of security. A consolidated Field Operations and Maintenance campus would minimize these challenges and allow for future expansion, especially with the merger of the Public Works and Utilities Departments to Municipal Services & Operations (MSO).
Design Engineer	To Be Determined

Contractor	To Be Determined
Status	Currently in Study Phase, Design and Construction Phases To Be Determined
Project Budget	To Be Determined, \$7,360,000 Currently Available
Project Details	City staff conducted a space-needs analysis and determined an 80 to 100-acre site will be sufficient for current facility requirements as well as future expansion. A team of nine City staff is reviewing and studying ten potential sites for recommendation of three sites for further evaluation and selection of one site to begin design and construction of the facility.
Related Projects	PW18B7CIP – PW/Utilities/P&R Operations Center

III. Other Sanitary Sewer and Stormwater Projects Completed in 2018 and Underway

UT1518 – 19th St Water and Sewer Replacement

Project Description	Replacement of an existing 10-inch cast iron water main on the south side of 19 th Street from Iowa to east of Naismith Dr; and an existing 10-inch cast iron main along Stewart Ave from 19 th Street to south of the fire station. Replacement of an existing VCP sanitary sewer main along the north side of 19 th Street from Ellis Dr to east of Naismith Dr.
Design Engineer	Professional Engineering Consultants
Contractor	R.D. Johnson
Status	Project Completion August 2019
Project Budget	\$580,464 (Completed - \$4,115 for Design in 2018)
Related Project	UT9902CIP – Watermain Replacement/Relocation Program PW18E7CIP – 19th St – Iowa St to Naismith Dr.

UT1611 – OSI Software Analytics

Project Description	Developing software for compiling/analyzing wastewater and water treatment plant processes and laboratory data. The data will be used with OSISoft PI software for data analytics, chemical and electrical costs/usage, and performance analysis.
Design Engineer	Black & Veatch
Contractor	Black & Veatch

Status	<p>Since spring of 2017, department staff have utilized the OSISoft PI and Asset360 software for Kansas River Wastewater Treatment Plant. Black & Veatch gives weekly reviews of process, quarterly reports and presentations to Department Staff outlining their observations, and provides recommendations for improvements in process performance and potential cost savings. The software implementation for the Kaw Water Treatment Plant has been implemented. Clinton Reservoir Water Treatment Plant is currently being implemented and reviewed by operations staff, following the software development and execution at the Kaw Water Treatment Plant. Software for the Wakarusa River Wastewater Treatment Plant is under development, with plans for implementation in spring 2018. A group has been formed comprising of SciTek, WQ, and Treatment Operations personnel to review the current implementation and provide feedback to enhance the product and increase the adoption and use of this product by Treatment Operations. There is currently no formal contract for ongoing services from B & V. City of Lawrence is waiting for B&V to provide.</p>
Project Budget	\$88,000 (Complete \$85,375)
Project Details	<p>Black & Veatch will deliver the following with the development of the OSI PI software; Data Integration Services – gathering of data from multiple sources to be analyzed, Software Services Provided – OSISoft PI System Tools, Asset360 Performance Analyst, Asset360 Activated Sludge Treatment Application; Setup and Training; Reporting – a quarterly report B&V process engineers will review plant data and trends. The data is analyzed for producing a performance report that summarizes overall plant performance. Recommendations are provided for treatment improvements or operational changes that may result in energy or chemical savings.</p>

UT1714 – Kansas River WWTP Chemical Storage & Feed and Excess Flow Building Protective Maintenance Coatings

Project Description	Protective coatings applied to mechanical equipment and other structures prevent corrosion, maintain functionality, and extend useful life.
Design Engineer	City Staff
Contractor	MVP Painting
Status	Project Completion January 2018
Project Budget	\$165,000 (Completed - \$112,357)

Project Details	Protective coating applications to the interiors of and equipment in the Chemical Storage Building, Excess Flow Building and the Crane and Gantry at the Kansas River WWTP including walls, floors, stairs, pipes, pumps, and other appurtenances, with appropriate preparatory work. During January 2018 the project reached final completion.
Related Project	UT9906CIP – Kansas River WWTP Annual Improvements



UT1808 – Kansas River WWTP Bar Screen Replacement

Project Description	Replacement of mechanical bar screen at the Kansas River Wastewater Treatment Plant.
Design Engineer	Black & Veatch
Contractor	To Be Determined
Status	Currently in Design Phase, Project Scheduled for Completion in Fall 2019
Project Budget	\$2,400,000 (Complete - \$37,576)
Related Project	UT9906CIP – Kansas River WWTP Annual Improvements

UT1803 – 2000 Block of Kasold Sanitary Sewer Replacement Project

Project Description	The purpose of this project is replace an 8" sanitary sewer currently serving the east side of the 2000 Block of Kasold Dr. The sewers included in this project have degraded beyond the point where other less costly sewer rehabilitation methods are possible.
Design Engineer	BG Consultants
Contractor	TBD
Status	Project Completion Summer 2019
Project Budget	\$150,000 (Completed - \$22,017)

Project Details	Replace approximately 880 feet of existing 8" sanitary sewer using pipe bursting construction method.
Related Project	UT9909CIP – Rapid I/I Reduction Program

PW17S2CIP – 13th and Brook Drainage Improvements

Project Description	Install open span structure to improve overall drainage.
Design Engineer	City Staff
Contractor	City Staff
Status	Deferred to 2019
Project Details	Originally scheduled for 2018 but was delayed to account for the stormwater portion of the east 9th Street Project. The major storm sewer line running west to east along 9th Street was completely replaced. This project was originally intended to be designed and completed with in-house forces.
Project Budget	\$275,000 (Completed - \$0)

PW17S3CIP – Storm Water Culvert Lining

Project Description	Rehabilitate failing storm water culverts by rehabilitation without doing dig and replace.
Design Engineer	City Staff
Contractor	City Staff and Contract Maintenance
Status	Ongoing Program
Project Budget	\$250,000 (Completed - \$110,000)
Project Details	This program is intended to address issues found with the new storm sewer TV inspection van. Some replacement and repair work would be completed by in house forces when practical, the remaining work and storm sewer lining to be contract maintenance projects. Work locations: 17th Street - Tennessee to Kentucky; 15th Street Emergency Repair; and 9th Street - alley between Connecticut & New York Streets.
Related Project	<u>PW17E66CIP – E. 9th Street (New Hampshire Street to Pennsylvania Street)</u>

UT1885CIP – Bowersock Dam Scour Hole Maintenance

Project Description	Repair and restoration of the existing scour hole on the downstream side of the Bowersock Dam.
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Design Engineer	RFP process with a defined scope. The successful contractor will provide necessary plan for agency approvals.
Contractor	RFP is being reviewed
Status	RFP was received in November
Project Budget	\$1,000,000 (Water Funds, Completed - \$0) \$1,000,000 (G.O. Debt PW17E9CIP, Completed - \$0)
Project Details	Repair and stabilization of south bank of river below Abe and Jakes
Related Project	PW17E9CIP – Riverbank Stabilization East of Bowersock

PW1802 – Fiber Redundancy Project

Project Description	Combined City and University of Kansas fiber redundancy project to create a second connection to KanRen ISP for both organizations and to complete a fiber ring in eastern Lawrence as well as connect the Kansas River Waste Water Treatment Plant to the Wakarusa River Waste Water Treatment Plant. In addition, to connect to the existing internet back bone access point on Noria Road to expand access to multiple internet service providers for the City and the University of Kansas.
Design Engineer	City Staff
Contractor	Rylie Equipment
Status	Project Completed in March, 2019
Project Budget	\$218,821.00 (Completed - \$198,397.50)

Project Details	<p>Installation of (3) 1 1/4" conduit, handholes and fiber optic cable in the City Lawrence, Kansas from the intersection of West 23rd Street and Louisiana Street (conduit install beginning 650' north of 23rd & LA) to West 19th Street & Louisiana Street, then continuing west to West 19th & Illinois Street, then north to KU Price Hall at Sunnyside Drive and Illinois Street. The purpose of this project is to create a redundant fiber connection to KanRen, the internet service provider for the City and the University of Kansas and enable future connection to the traffic signal at the intersection of West 19th & Louisiana Street. Also from the intersection of West 23rd Street and Noria Road to the internet backbone access point just north of the railroad right-of-way at Noria Road. Then continuing along Greenway Circle from Noria Road west approximately 2,700 feet to the city drainage easement between 3780 Greenway Circle and 3800 Greenway Circle. Then north from Greenway Circle along the drainage easement to City Utilities Pump Station No. 25. The purpose of this project is to connect the city Kansas River and Wakarusa River sewage treatment plants and complete a redundant fiber ring in eastern Lawrence. In addition, to connect to the existing internet backbone access point to expand access to multiple internet service providers for the City and the University of Kansas.</p>
Related Project	ITFIBER – Annual Fiber Projects

UT1614 – CIS Replacement

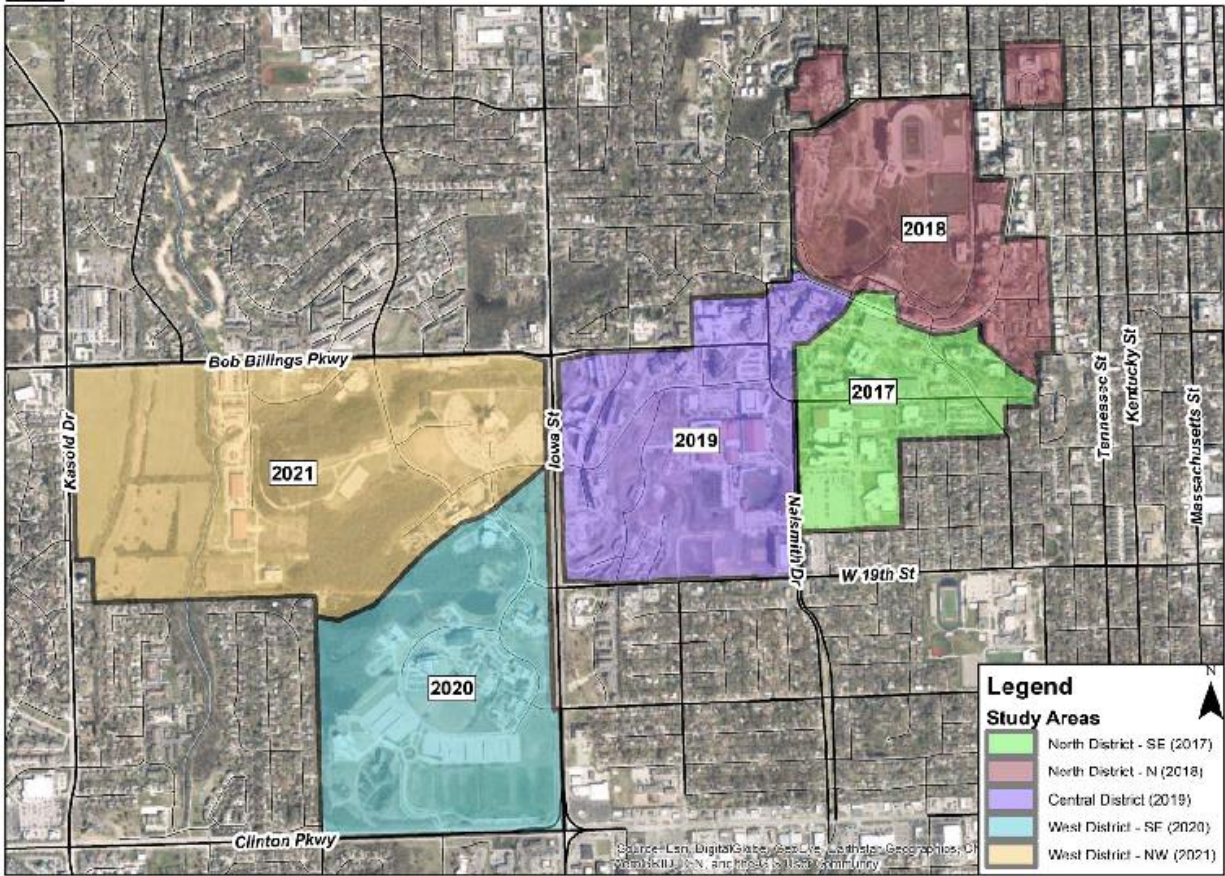
Project Description	This project includes implementing a new billing system (CIS) and a meter data management system
Procurement Consultant	Soft Resources
Vendors	Advanced Utility Systems and SmartWorks
Status	Project Completion December 2019
Project Budget	Part of the UT1898CIP Project Budget of \$10.8 mil (Completed - \$710,716.32)

Project Details	<p>2018 Project Work</p> <p>With the assistance of SoftResources, a consulting firm, and in conjunction with the Utilities and Solid Waste department, the Finance department selected Advanced Utility System's (AUS) CIS Infinity product as the new billing system software, as well as SmartWorks as the Meter Data Management system, which will provide communication between the advanced metering infrastructure software and the billing system.</p> <p>AUS provided Core Training to the Core Team, completed data conversion meetings, and conducted Discovery sessions for each of the functional areas, including required interfaces. The Core Team began testing Lawrence data in Infinity and reporting on any found issues.</p>
Related Project	<p>UT1898CIP – Automated Meter Reading Installation</p> <p><u>UT1813 – Automated Metering Infrastructure</u></p>

IV. University of Kansas Sewer Rehabilitation Project

Project Description	<p>In 2017, the University of Kansas (KU) initiated a 5-year recurring program in which 20% of the University's sanitary sewer collection system will be cleaned and inspected each year. At the conclusion of each study phase, recommendations for improvements are to be made and designs developed for implementation the following summer in an "identify – design – fix" procedure. At the end of the 5th year, it is anticipated that 100% of the University's collection system will have been cleaned and inspected. The program will then begin repeating in its 6th year.</p>
Design Engineer	PEC
Contractor	Kissick Construction (2018)
Status	<p>North District – SE (Study Completed 2017, Repairs Started 2018)</p> <p>North District – North (Study Completed 2018, Repairs Planned 2019)</p> <p>Central District – (Study Planned 2019)</p>
Project Details	<p>Figure 1 shows the 5 delineated sewer areas with a year indicating when project activities will start in that sewershed.</p>

 Figure 1: Preliminary Sewersheds



V. FL1701 Farmland Remediation



Project Description	Site improvements and updated remediation efforts for the Farmland remediation area. The scope of the project is to provide a comprehensive solution to the current nitrogen rich groundwater on the former Farmland Fertilizer Plant site and outline the capital cost, environmental impact, and long-term operational costs for proposed remediation systems. Interim site updates have been implemented in-house to ensure the current remedial action plan is functional until a new plan is developed.
Design Engineer	City Staff, GHD
Contractor	City Staff, TBD after KDHE approval
Status	In 2019, field investigations and inspections will be conducted in the Central District. It is estimated that approximately 14,080-feet of sewer main and 102 manholes are located within this basin.
Project Budget	\$1.2 million for capital improvement on site
Project Details	This project's aim is to develop a new remediation strategy for groundwater impacted by nitrogenous compounds due to the operation of the former Farmland fertilizer plant. Due to variable nitrate and ammonia concentrations in the collected water, increases in the volume of contaminated water collected, changes of ownership in the properties participating in the land application program, and lack of infrastructure to expand the land application program, the Municipal Services & Operations Department opted to contract with a qualified consultant in 2018 to develop a new long-term remediation plan. The new plan will be either supplemental to the current land application system, or replace it completely with a more efficient, sustainable solution.

**Remediation
Plan
Development**

Phase one of this effort, approved by the City Commission on April 3, 2018, includes professional services related to site study, analysis of alternative remediation strategies and regulatory approvals for alternative strategies prepared by the selected firm, GHD Inc.

The project scope, as proposed by GHD at the beginning of this year, includes data review, existing remediation systems evaluation, remediation alternative evaluation and recommendation, and community engagement.

Staff and GHD have worked continuously to produce a remediation alternative that may be presented to the Kansas Department of Health and Environment (KDHE). The first step in the approved contract with GHD included site data review and development of an updated conceptual site model. During the development of this static model, GHD and the City have encountered data gaps in historical information that have been collected on the site. To address these data gaps, the City Staff and GHD prepared a data gap study work plan that has been presented to and is under review by KDHE. KDHE has indicated the plan should be approved by February 2019. Upon approval of this work plan, City staff intends to provide an update to the City Commission along with an agenda item containing a change order to address the additional work.

Until this plan is approved and the data gap study has been performed, an alternative analysis and recommendation of remedial alternatives cannot be reasonably completed and presented to KDHE for review and approval.



VI. NPDES Permit Status

a. Permit Background

Wastewater Treatment Plants

Starting in 2004, the City's Utilities Department (now MSO) began using an enhanced high rate clarification (EHRC) process to mitigate sewage releases during wet weather through ACTIFLO, an auxiliary, chemical ballasted, treatment system. ACTIFLO-treated effluent is combined with effluent from the Kansas River WWTP activated sludge train prior to discharge. EHRC is a critical treatment process to prevent the discharge of raw sewage on wet weather days in which influent flows exceed the 25 million gallons per day (MGD) capacity of the Kansas River WWTP biological process.

KDHE reviews and renews the City's NPDES permits every five years. In 2008, KDHE drafted a revised permit as part of that renewal process. EPA objected to aspects of the KDHE draft permit based on their 2005 interpretation of blending. EPA contended that EHRC and Lawrence's practice of blending was a "bypass" and thus illegal, despite the lack of material change to related provisions in the 2008 permit when compared to permits for the prior ten years. In 2014, after six years of discussions with EPA, KDHE (with assistance from the National Association of Clean Water Agencies and City staff) proposed a compromise permit that allows EPA to keep its position that blending constitutes a bypass, while allowing Lawrence to contend it does not.¹ The Kansas River WWTP permit was then issued on August 1, 2014, followed by the Wakarusa River WWTP permit on September 1, 2014, with both Permits currently active and in force.

Stormwater Permit

The City's original Municipal Separate Storm Sewer System (MS4) Permit became effective on October 1, 2004. The City of Lawrence is a Phase II Community as designated by the National Pollutant Discharge Elimination System (NPDES). 2018 represented the City's fourteenth permitted year, and second issuance term of a MS4 Permit. The most recent permit was issued by the Kansas Department of Health and Environment (KDHE) and became effective February 1, 2014.

Farmland

The City of Lawrence acquired the 467-acre former Farmland Industries site in 2010, with a commitment to manage nitrogen-laden water on the property. The primary contaminants of concern are nitrate and ammonia. These contaminants are elevated in groundwater, soil, sediments, and surface and storm water. To staff's knowledge, a National Pollutant Discharge Elimination System (NPDES) permit has been maintained for this site since 1972.

b. Integrated Plan Incorporation

Section (F) *Supplemental Information* of each Permit incorporates by reference the Integrated Plan and the MOU and further acknowledges the Integrated Plan's adoption as

¹ The Kansas River and Wakarusa Permits were both administratively extended during this period to allow for detailed discussion on EHRC, including an ACTIFLO demonstration and review of 10 years of performance data.

the initial Integrated Municipal Stormwater and Wastewater Planning document for wastewater system improvements. Using Integrated Plan principles, the Permits provide a coordinated, phased-in approach for future expansions, wet weather flows, and nutrient removal requirements. The Kansas WWTP Permit requires efforts to reduce nitrogen and phosphorus through mechanical methods and report the results to KDHE by February 1, 2017. The Wakarusa WWTP Permit outlines a phased-in approach for future plant expansion. The City was also required to complete a biota study on the Wakarusa River as the receiving stream for the Wakarusa WWTP effluent.

c. Permit Update

A study to reduce nitrogen and phosphorus at the Kansas WWTP through existing mechanical methods was conducted, with collaborative input and review from Dr. Belinda Sturm, a KU professor and civil engineer whose research emphasis is water sustainability and resource recovery. A final report was submitted to KDHE January 30, 2017.

VII. MOU Attachment 1 - Project Changes

a. Modified/Clarified

1. All items were updated to 2018 Cost Opinion.
2. Item 1(k) Collection System Field Operations Building – Adjusted cost estimation from \$3,680,000 to \$7,150,000 due to additional needs, new projected start date of 2019.
3. Item 3(e) Side Stream Treatment – Ammonia from Belt Press – Adjusted cost estimation from \$8,310,000 to \$9,010,000.

Attachment 1 (updated)

Memorandum of Understanding, Kansas Department of Health and Environment and the City of Lawrence, Kansas

	Item	Reason for Improvement Project	2018 Cost Opinion	Currently Projected Start Date *
1	Collection System**			
a	PS 9 expansion to 15 MG (2)	1, 3	\$3,280,000	2021
b	PS 32 expansion to 1.7 MGD, 8" force main	1	\$0	Not needed in foreseeable future, will monitor
c	PS 25 expansion to 4 MG, Add 3rd Pump (2)	1	\$260,000	2025
d	PS 25 expansion to 6 MG, parallel 12" force main (2)	1	\$2,920,000	2030
e	21" gravity sewer to eliminate PS 8	3	\$4,610,000	2018
f	KR-5C 12" relief sewer	3	\$1,390,000	2026
g	KR-6B 21" relief sewer	3	\$1,270,000	2027
h	PS 23 submersible expansion to 0.1 MGD	1, 3	\$0	Not needed in foreseeable future, will monitor
i	PS 48 expansion to 6.4 MGD (2)	1	\$640,000	2031
j	PS 04 Redundant Forcemain ***	2, 3	\$1,644,000	Completed September 2014
k	MSO Field Operations Building	3	\$7,150,000	2019
l	PS 49 to Wakarusa WWTP	1, 2	\$2,850,000	2025
m	Lower Yankee Tank Capacity - YTC-1-1 (2)	1	\$8,650,000	2022
n	PS 16 Upstream Interceptor Rehabilitation	1, 3	\$1,320,000	2021
o	PS 9 Forcemain to PS 10	1, 3	\$6,330,000	2021
Subtotal			\$42,314,000	
2	Wakarusa WWTP			
a	New 2.5MGD Wakarusa WWTP - Completed all structures	1,2	\$74,100,000	Final Completion June 5, 2018
b	Wakarusa Expansion to 5MGD	1, 2	\$26,850,000	2030
Subtotal			\$100,950,000	
3	Kansas River WWTP - Maintaining 12.5 MGD			
a	Nutrient Removal	2	\$0	Nutrient Removal now Pilot & Modification
b	Co-generation & Backup Power	3	\$2,200	2014 - Not feasible/cost-effective
c	Nutrient Removal/Deammonification Pilot	2	\$610,000	2020

d	Nutrient Removal/Deammonification Modification	2	\$36,610,000	2022
e	Side Stream Treatment - Ammonia from Belt Press	2	\$9,010,000	2022
Subtotal			\$46,232,200	
4	Collection System Rehabilitation Plan			
a	Rapid I/I Reduction Program	2, 3	\$56,610,000	2013 & Ongoing (annual expenditures)
b	Clay Pipe and Manhole Rehabilitation Program	2, 3	\$22,600,000	2013 & Ongoing (annual expenditures)
Subtotal			\$79,210,000	
Combined Total			\$248,430,405	

- * Parties' Best Projection for Start of Design or Construction
- ** Development Related Growth Projects Are Not Included in CIP
- *** Actual Cost

Reason for Improvement Project

- 1 - Growth
- 2 - Regulatory
- 3 - Reliability