Integrated Overflow Control Program
for the Unified Government of Wyandotte County and Kansas City, Kansas and
Approved with Conditions by the U.S. Environmental Protection Agency
March 23, 2020

I. Introduction

This document and Appendix A, attached hereto, constitute the approved Integrated Overflow Control Plan ("IOCP") for Sanitary Sewer Overflow ("SSO") and Combined Sewer Overflow ("CSO") Control Measures pursuant to the Consent Decree in the matter of The United States v. The Unified Government of Wyandotte County and Kansas City, Kansas, and the State of Kansas, entered May 20, 2013. The Unified Government shall implement the Sewer System Control Measures and achieve the Performance Criteria identified herein in accordance with the requirements and terms of this IOCP and the Consent Decree.

The Unified Government anticipates that it will need to invest in excess of approximately $900 million dollars (between January 1, 2018 through December 31, 2044), estimated to be approximately $640 million in 2018 dollars, to implement the Sewer System Control Measures and achieve the Performance Criteria identified herein. To raise the revenue necessary, the Unified Government will raise user rates (intended rate increase scenario of 5% annually from 2020 to 2023, 3-4% annually from 2024 to 2029, and 2.5-3.5% annually from 2030 to 2044).

This IOCP reflects a number of key assumptions that the Unified Government believes may directly affect its ability to implement the proposed Control Measures in the timeframes identified herein. The Unified Government's assumptions include, but are not limited to: (1) terms of available debt funding, (2) number of households/customers, (3) water volume use per account, (4) personnel, maintenance, and utilities costs, (5) customer median household income, (6) revenue collection rate, (7) regional construction contractor availability, (8) current estimated costs to implement the IOCP, (9) current estimated costs to comply with the Unified

Government's NPDES permits, and (10) other factors referenced in the 1997 *Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development*.

II. Definitions

All terms used in this IOCP shall have the meaning set forth in Section IV of the Consent Decree (Definitions) and as supplemented or modified by the definitions set forth below:

"Achieve Full Operation" shall mean, as applicable, (a) the date by which construction in accordance with the applicable Design Criteria has been completed for each Control Measure identified in **Tables 1.1** and **2.1** of this IOCP, and full operation of the Control Measure has been commenced and verified or (b) the date by which construction has been completed for each Infrastructure Project identified in **Tables 3.2** and **3.3** in Section IV of this IOCP (Infrastructure Projects) and the achievement of full operation of the Project has been verified.

"Adequate Capacity" shall mean the ability to collect, convey and treat peak wet weather flows in the Separate Sewer System for a 5-year design storm event, except where indicated in **Table 1.2** of this IOCP for a 2-year design storm event. (This definition replaces the definition of "Adequate Capacity" in the Consent Decree.)

"Capacity, Management, Operations, and Maintenance" or "CMOM" shall mean, the Unified Government's program for managing, operating, and maintaining its Sewer System, which was approved by EPA on November 20, 2014, as it may be amended. (This definition replaces the definition of "Capacity, Management, Operation, and Maintenance" in the Consent Decree.)

"Combined Sewer System Interim Performance Benchmarks" or "CSS Interim Performance Benchmarks" shall mean the cumulative level of system-wide wet weather CSO volume reductions in the Design Year identified in **Table 2.2** of this IOCP at the end of each Achieve Full Operation period for the corresponding CSO Control Measures identified in

Table 2.1 of this IOCP. The CSS Interim Performance Benchmarks provide a point of reference to monitor progress towards achievement of the CSS Performance Criteria such that appropriate adjustments may be made as proposed in appropriate Supplemental Compliance Plans (as part of Control Measures Reports). Stipulated penalties for failure to meet the CSS Interim Performance Benchmarks shall accrue from the applicable deadlines in **Table 2.2**, unless the Unified Government has timely submitted an adequate Supplemental Compliance Plan pursuant to Section III.H of this IOCP.

"Combined Sewer System Performance Criteria" or "CSS Performance Criteria" shall mean the level of control following the Unified Government's achievement of full operation of all the CSO Control Measures specified in **Table 2.1** of this IOCP that achieves: (a) discharges of no more than 4 to 6 times in the Design Year to Jersey Creek (CSOs 14, 15, 16, 17, 19, 55 and 81, or other CSOs, if approved by EPA); and (b) system-wide percent capture of Design Year wet weather volume of no less than 85 percent.

"Construction Start Date" shall mean the date by which physical construction activities will commence for each SSO or CSO Control Measure identified in **Tables 1.1** and **2.1** in Section III of this IOCP (CSO and SSO Control Measures) and for each Infrastructure Project identified in **Tables 3.2** and **3.3** in Section IV of this IOCP (Infrastructure Projects), which the Unified Government may correlate to its "Notice to Proceed."

"Control Measures" shall mean the remedial measures for the Sewer System identified in this IOCP.

"Control Measures Report" shall mean a report periodically performed and submitted by the Unified Government, pursuant to the requirements of Sections III (SSO and CSO Control Measures) and V (Post-Construction Monitoring Program) of this IOCP, evaluating the

effectiveness of SSO and CSO Control Measures and any applicable Projects identified in Section IV (Infrastructure Projects) of this IOCP.

"Design Year" shall mean the rainfall distribution patterns and recurrence intervals developed to represent conditions expected in a typical or "average" year applied to hydraulic models when modeling existing conditions and alternative control scenarios for the CSS. Design storms are utilized to mimic the event distribution on an annual and seasonal basis resulting in a full Design Year hyetograph. For purposes of the Consent Decree, the Design Year is defined as the design storms which have the depth, peak hourly intensity, duration, and frequency as described in Section 3.3 of the Draft CSS Characterization Report submitted by the Unified Government on May 31, 2015, and restated in Section VII of this IOCP. (This definition replaces the definition of "Design Year" in the Consent Decree.)

"Dry Weather" shall mean a twenty-four (24) hour period with no more than one-tenth of an inch of rainfall, preceding a combined sewer overflow event.

"Infrastructure Projects" or "Projects" shall mean the annually recurring and remedial Work in the Sewer System and Municipal Separate Storm Sewer System ("MS4") identified in Section IV of this IOCP.

"Integrated Overflow Control Plan" or "IOCP" shall mean this IOCP and any revisions to this IOCP that have been approved by EPA, after consultation with the State.

"MS4 Permit" shall mean NPDES Permit No. KS0095656 ("MS4 Permit"), with an effective date of February 1, 2020, and any subsequently issued permit, which authorizes discharges from the Unified Government's MS4 in accordance with conditions specified therein. (This definition replaces the definition of "MS4 Permit" in the Consent Decree.)

"Performance Criteria" shall mean the numeric and narrative specifications included in Section III of this IOCP that must be met following the Unified Government's achievement of full operation of the Control Measures specified in Section III.

"Private Lateral" shall mean that portion of the Sewer System not owned by the Unified Government used to convey wastewater from a building or buildings to that portion of the Sewer System owned by the Unified Government. A Private Lateral includes the connection to the Unified Government's sewer line. (This definition replaces the definition of "Private Lateral" in the Consent Decree.)

"Private Property Backup" shall mean any release of wastewater from the Unified Government's Sewer System into buildings or onto private property that occurs when a wastewater backup occurs into a building and is caused by blockages, flow conditions, or other conditions in the Sewer System. For purposes of the Consent Decree a wastewater backup that is caused solely by conditions in a Private Lateral or privately-owned sewer is not a Private Property Backup or SSO. (This definition replaces the definition of "Private Property Backup" in the Consent Decree.)

"Project Start Date" shall mean the Calendar Year during which design and other work related to a Control Measure listed in **Tables 1.1** or **2.1**, or an Infrastructure Project listed in **Tables 3.2** or **3.3**, is expected to commence.

"Sanitary Sewer System Performance Criteria" or "SSS Performance Criteria" shall mean the numeric and narrative specifications included in Section III of this IOCP, **Table 1.2**, that must be met following the Unified Government's achievement of full operation of the SSO Control Measures specified in Section III of this IOCP, **Table 1.1**.

"Supplemental Compliance Plan" or "SCP" shall mean a proposed plan, submitted by the Unified Government in accordance with Section III of this IOCP, for additional Control

Measure(s) to address a failure of Control Measure(s) identified in Section III to meet the CSS Interim Performance Benchmarks or SSS Performance Criteria by the applicable Achieve Full Operation date. The Control Measure(s), design criteria and schedule(s) approved by the Environmental Protection Agency ("EPA") in a Supplemental Compliance Plan ("SCP") are incorporated into and enforceable under the Decree.

III. CSO and SSO Control Measures

A. Implementation

1. The Unified Government shall implement the Control Measures for the Sewer System in accordance with Section III (Objectives) of the Consent Decree and with the Performance Criteria and by the deadlines to Achieve Full Operation set forth in this IOCP. All Control Measures shall be completed and in full operation by no later than December 31, 2044.

2. Additional Jersey Creek CSO Control Measures. By no later than December 31, 2020, the Unified Government shall submit to EPA for review and approval in accordance with Section XII (Reporting, Certification and Approval of Submittals) of the Consent Decree, proposed CSO Control Measure(s) to reduce overflows at CSOs 14, 15, 16, 17, 19, 55 and 81 to no more than four to six overflows in the Design Year. The proposed CSO Control Measure(s) submittal shall include a schedule for achievement of full operation of such measures as expeditiously as possible, but no later than December 31, 2032. As part of its proposed plan, the Unified Government may propose adjustments, as appropriate, to the CSO Control Measures, Design Criteria, Project Start dates, and Achieve Full Operation dates for the existing CSO Control Measures identified in **Table 2.1**, and Post-Construction Monitoring Program, to offset the increased percent capture that will be achieved because of the additional treatment requirements in this paragraph for the CSOs discharging into Jersey Creek from the percent capture that will be achieved from any remaining CSO Control Measures. Any such adjustments

shall still ensure the achievement of the system-wide percent capture of Design Year wet weather volume of no less than 85 percent. Any such proposed adjustments are subject to EPA review and approval. Proposed adjustments under this Paragraph may be made under Section III.D (Adaptive Management) of the IOCP, if such adjustments meet the criteria set forth in that Section, or Section XXII (Modification) of the Consent Decree. The Unified Government may also propose, with justification, alternative CSOs in Jersey Creek to the CSOs listed above for additional control. Such a proposal for changing the CSOs to be addressed shall, at a minimum, provide an updated CSO prioritization review and demonstrate that the proposed CSO Control Measure(s) will achieve an equivalent or better reduction in overflow volume and activation frequency for the segment of Jersey Creek located in Jersey Creek Park (south of Parallel Parkway between approximately North 5th Street and North 18th Street). EPA's disapproval of the Unified Government's proposal to change the CSOs to be addressed in Jersey Creek shall not be subject to Dispute Resolution.

3. Post-Construction Monitoring. The Unified Government shall immediately implement the Post-Construction Monitoring Program in Section V of this IOCP.

4. Achievement of Compliance. The Unified Government shall ensure that all Control Measures are designed and implemented in accordance with sound engineering practices to ensure Performance Criteria will be achieved and the Objectives set forth in Section III of the Consent Decree are satisfied. The Unified Government shall Achieve Full Operation for the Control Measures set forth in this IOCP by the specified dates, but in no event later than December 31, 2044. After achievement of full operation for all Control Measures, and in no event later than December 31, 2046, the Unified Government shall complete Post-Construction Monitoring and submit the final Post-Construction Monitoring Report in accordance with Section V, below.

B. Sanitary Sewer Overflow Controls

5. In accordance with Section XI (Implementation of the IOCP) of the Consent Decree, the Unified Government shall implement the SSO Control Measures in accordance with the schedules set forth in **Table 1.1**, below, and shall achieve the Sanitary Sewer System ("SSS") Performance Criteria storm event levels of service set forth in **Table 1.2**.

6. Each Annual Report required by Paragraph 60 of the Consent Decree shall include updated project information, including anticipated and actual Construction Start Date and Achieve Full Operation dates, and project status updates for each SSO Control Measure.

C. Combined Sewer Overflow Controls

7. In accordance with Section XI of the Consent Decree (Implementation of the IOCP), the Unified Government shall implement the CSO Control Measures in accordance with the schedules set forth in **Table 2.1**, below, and shall achieve the following Performance Criteria for the Combined Sewer System ("CSS"):

a. By no later than December 31, 2032, the CSOs that discharge to Jersey Creek (CSOs 14, 15, 16, 17, 19, 55 and 81, or other CSOs, if approved by EPA) shall discharge no more than 4 to 6 times in the Design Year; and

b. By no later than December 31, 2044, the system-wide Design Year wet weather CSO discharge volume remaining upon completion of the CSO Control Measures shall be no more than 378 million gallons ("MG"), which the Unified Government represents as 85 percent wet weather capture within the CSS.

   i. The Unified Government represents that the current CSO discharge volume as of the Date of submittal of the Unified Government's *Draft IOCP Supplement, August 31, 2018*, is 845 MG. The baseline of 845 MG

CSO discharge volume will be used to measure compliance with the CSS Interim Performance Benchmarks and Performance Criteria.

8. Each Annual Report required by Paragraph 60 of the Consent Decree shall include updated project information, including anticipated and actual Construction Start Date and Achieve Full Operation dates, and project status updates for each CSO Control Measure.

D. Adaptive Management for SSO and CSO Control Measures

9. At least ninety (90) days prior to the Construction Start Date for each SSO or CSO Control Measure (**Tables 1.1** and **2.1**), the Unified Government may submit a proposal to EPA, for review and approval, of one or more deleted, revised and/or alternative Control Measure(s), including Design Criteria and Achieve Full Operation dates, in lieu of the specific SSO and CSO Control Measures set forth in **Tables 1.1** (SSO Control Measures) and **2.1** (CSO Control Measures), respectively. The Unified Government will provide additional advance time for EPA review of more complex proposals, as appropriate. Each proposal for a deleted, revised and/or alternative Control Measure(s) shall:

a. Provide detailed project information and Design Criteria (such as size and length of new sewer lines, sewer infrastructure or upgraded pumping capacity; the volume of storage, acreage of Green Infrastructure improvements, or acreage of CSS area to be separated; and the anticipated volume reduction or level of service, etc.);

b. Include an implementation schedule for completion of revised and/or alternative Control Measures by the same Achieve Full Operation date as the original Control Measures set forth in **Tables 1.1** and **2.1**, notwithstanding, the Unified Government may request, and EPA may approve, an extension of the Achieve

Full Operation date of up to one year where the Unified Government demonstrates the need for such an extension; and

c. Demonstrate that any deleted, revised and/or alternative Control Measures that vary from the Design Criteria in **Tables 1.1** or **2.1** will achieve equal to or better SSO Level of Service, CSS Interim Performance Benchmarks or, where applicable, CSS Performance Criteria than what would be achieved by the original Control Measure(s).

10. EPA disapproval of a proposal for deleted, revised and/or alternative SSO or CSO Control Measures is subject to Section XV (Dispute Resolution) of the Consent Decree under the standard of review set forth in Paragraph 94(a) (Disputes Concerning Matters Accorded Record Review). For purposes of the Consent Decree, EPA approval of a proposed deleted, revised and/or alternative Control Measure that meets the requirements of Paragraph 9 and does not change the final deadline for compliance under this IOCP (Paragraph 1), the CSS Interim Performance Benchmarks (**Table 2.2**, below) or the SSS or CSS Performance Criteria, and does not extend the Achieve Full Operation date (**Tables 1.1** and **2.1**) by more than one year, shall not be considered a Modification pursuant to Section XXII of the Consent Decree.

E. Modification Based on Changed Financial Circumstances

11. It is recognized that the information currently available to the Unified Government as well as the Unified Government's current assumptions and projections may change during implementation of the Control Measures. The Unified Government may submit a proposal to EPA to modify the schedule and/or the Control Measures set forth in **Tables 1.1** (SSO Control Measures) and **2.1** (CSO Control Measures), respectively, pursuant to Section XXII (Modification) of the Consent Decree, based on a significant adverse change in the information currently available to the Unified Government, the Unified Government's current

assumptions or projections, its financial circumstances or other financial or budgetary issues, whether or not such change is anticipated.

12. In the event that the Unified Government seeks to modify the schedule and/or the Control Measures set forth in **Tables 1.1** (SSO Control Measures) and **2.1** (CSO Control Measures), respectively, based upon a significant increase in costs or other changes in financial circumstances, the Unified Government shall submit to EPA a current Financial Capability Assessment (based on *EPA's Combined Sewer Overflows—Guidance for Financial Capability Assessment and Schedule Development*, referenced at EPA 832-B-97-004 and dated February of 1997, and *EPA's Financial Capability Assessment Framework*, dated November 24, 2014, or subsequent versions thereof). The Unified Government may also submit with its request any other information that the Unified Government would like EPA to consider regarding the requested modification.

F. SSS Performance Criteria Evaluations

13. The Unified Government shall perform and submit to the EPA, for review and approval pursuant to Section XII of the Consent Decree (Reporting, Certification and Approval of Submittals), a Control Measures Report with its Annual Report for the Calendar Year following the Achieve Full Operation deadline for each SSO Control Measure identified in **Table 1.1** that demonstrates that the applicable SSS Performance Criteria Level of Service specified in **Table 1.2** has been achieved. For each submittal, the Unified Government shall comply with the requirements for Control Measures Reports specified in Section V of this IOCP (Post-Construction Monitoring Program) and run a design storm simulation of the most recently calibrated hydraulic model to demonstrate achievement of the Level of Service identified in **Table 1.2** for each SSO Control Measure.

G. CSS Interim Performance Benchmark Evaluations

14. The Unified Government shall perform and submit to the EPA, for review and approval pursuant to Section XII of the Consent Decree (Reporting, Certification and Approval of Submittals), a Control Measures Report with its Annual Report for the Calendar Year following the Achieve Full Operation deadline for the CSO Control Measures identified in **Table 2.1** within each CSS Interim Performance Benchmark period identified in **Table 2.2** that demonstrates that the applicable Interim Performance Benchmark has been achieved. For each evaluation, the Unified Government shall comply with the requirements for Control Measures Reports specified in Section V (Post-Construction Monitoring Program), below, and:

a. run a continuous simulation of the most recently calibrated hydraulic model using the Design Year to demonstrate progress toward achievement of the CSS Performance Criteria and the CSS Interim Performance Benchmarks identified in **Table 2.2**; and

b. analyze whether Control Measures will ultimately achieve the CSS Performance Criteria and, when applicable, the next cumulative CSS Interim Performance Benchmark.

H. Supplemental Compliance Plans

15. If, following post-construction monitoring as required by Section V (Post-Construction Monitoring Program), below, the analysis indicates that any SSO Control Measure identified in **Table 1.1** fails to achieve the Level of Service identified in **Table 1.2** or that a CSS Interim Performance Benchmark in **Table 2.2** will not be achieved by the date specified, the Unified Government shall submit to EPA, for review and approval, a Supplemental Compliance Plan ("SCP") by no later than August 31 following submittal of the Control Measures Report for

that SSO Control Measure pursuant to Paragraph 13 or CSS Interim Performance Benchmark pursuant to Paragraph 14, as applicable. At a minimum, the SCP shall include:

a. a detailed description of the proposed and/or revised control measure(s) to be implemented to address the shortcomings;

b. a demonstration that implementation of the proposed SCP will, as appropriate, (i) achieve an equal to or better SSO Level of Service than that which was required for the original Control Measure or (ii) achieve equal to or better CSS Interim Performance Benchmarks and CSS Performance Criteria than that which was applicable to the original Control Measure;

c. a schedule for implementation of the control measure(s) that is as expeditious as possible, but no later than 2 years after EPA approval of the SCP, unless EPA approves a later date; and

d. a post-construction monitoring plan for the proposed work in accordance with Section V (Post-Construction Monitoring Program), below.

16. The deadline to Achieve Full Operation for a SCP approved by EPA under this procedure to address a failed SSO Control Measure or missed CSS Interim Performance Benchmark shall be incorporated into **Table 1.1** or **Table 2.1**, as applicable, as the date to Achieve Full Operation under this IOCP.

17. EPA disapproval of a proposed SCP is subject to Section XV (Dispute Resolution), under the standard of review set forth in Paragraph 94(a) (Disputes Concerning Matters Accorded Record Review). For purposes of the Consent Decree, EPA's approval of a SCP that does not change the final deadline for compliance in Paragraph 1, above, the CSS Interim Performance Benchmarks or the SSS or CSS Performance Criteria shall not be considered a Modification pursuant to Section XXII of the Decree.

I. Demonstration of Compliance

18. SSOs. Upon completion of the SSO Control Measures identified in **Table 1.1**, below, the Unified Government shall use the validated and/or recalibrated SSS hydraulic models to run the 2-year and 5-year design storm events to demonstrate compliance with SSO elimination, in accordance with Section III of the Consent Decree (Objectives). The Unified Government shall characterize any rain events that triggered SSOs and demonstrate, consistent with the Post-Construction Monitoring Program as required by Section V of the IOCP, that the SSS has Adequate Capacity.

19. Such a demonstration shall be made using the validated and/or recalibrated Sewer System hydraulic models consistent with the models the Unified Government used to develop the proposed IOCP submitted by the Unified Government in September 2016, pertinent parts of which are summarized in Subsection J, below. The models used were dynamic hydraulic system models that were developed, calibrated and verified based on sewer system flow and rainfall data. The Sewer System hydraulic models are described in Section 2.2 of the Unified Government's September 2016 proposed IOCP.

20. CSOs. Upon completion of the CSO Control Measures identified in **Table 2.1**, below, the Unified Government shall demonstrate compliance with the CSS Performance Criteria as set forth herein. Achievement of the CSS Performance Criteria shall be completed in compliance with the Post-Construction Monitoring Program identified in Section V of this IOCP using the latest version of its Sewer System hydraulic model as described in Subsection J and the latest Sewer System monitoring data from the Post-Construction Monitoring Program, as completed in accordance with Section V of this IOCP.

21. The Unified Government shall calibrate the Sewer System hydraulic model in accordance with current industry calibration standards. Upon calibration of the Sewer System

hydraulic model (hereafter referred to as the "calibrated post-construction hydraulic model"), the Unified Government shall run a continuous simulation of the model inputting the Design Year used to develop the September 2016 proposed IOCP in place of the actual storms experienced during the post-construction monitoring period.

22. The CSS Performance Criteria will be met if the continuous typical Design Year simulation using the calibrated post-construction hydraulic model demonstrates the Sewer System discharges will achieve the system-wide Design Year wet weather volume capture as well as the Overflow Frequency (for Jersey Creek CSOs addressed by Paragraph 2, above only) identified herein.

J. Summary of Hydraulic Model Information

23. CSS and SSS hydraulic model details are provided in Section 2 of the Unified Government's September 2016 proposed IOCP.

24. SSS Hydraulic Modeling. Similar to the CSS hydraulic modeling, the principal tool used in assessing the capacity of the SSS was a dynamic hydraulic system model that was developed, calibrated and verified on the basis of sewer system flow and rainfall data obtained from a monitoring system specifically established and operated for that purpose. Innovyze's InfoWorks ICM was used for modeling the sewer system. The sewer system model couples base flow, precipitation, subcatchment information, and conveyance system information with hydrologic and hydraulic calculating procedures to simulate sewer system flow characteristics. This tool supports the engineering analysis necessary to plan sewer system improvements.

Table 1.1 – SSO Control Measures[1]

SSO Control Measure Name	Design Criteria[2]	Expected Benefits of Control Measure Implementation	Project Start Date	Achieve Full Operation by December 31 of stated year
Lower Connor Creek Interceptor	Install 16,000 LF of 36" diameter gravity interceptor to reroute former Pump Station 50 flow to the new Wolcott WWTP	Increases capacity for service population growth Reduces average daily flow and peak wet weather flows to Pump Station 6 and WWTP 20 Replaces aging pump station and force main infrastructure	2018	2022
Little Turkey Tributary North Interceptor Capacity Improvements	Replace existing gravity sewer with or build parallel relief gravity sewer of 150 LF of 24" diameter gravity sewer	Reduces surcharge potential Replaces aging pipe infrastructure	2020	2022
Wolcott WWTP, Phase 1	Construct new Wolcott WWTP with 2 MGD avg. daily flow (6 MGD peak wet weather flow)	Reduces O&M requirements Provides additional treatment capacity for growth and development Extends capacity of WWTP 20 Reduces nutrient loading to the Kansas River Improves Connor Creek water quality Replaces aging WWTP infrastructure Reduces average daily flow and peak wet weather flow to Pump Station 6 and Plant 20	2018	2022

[1] The objective of the work in this Table 1.1 is to eliminate SSOs throughout Unified Government's SSS.
[2] The Design Criteria are based upon Long-Term Control Plan-level planning estimates and may be subject to revision during facility planning and design. The Control Measures will be designed in accordance with good engineering practice to ensure that the basin-wide Performance Criteria will be achieved.
[3] Achieve Full Operation date is anticipated to be 2032 based on planning level flow projections of additional future growth within the service area. The Unified Government will provide information in the 2026 (or earlier) Annual Report demonstrating whether flows within the service area have approached the point where these projects are necessary and whether the Achieve Full Operation date should be modified accordingly.

SSO Control Measure Name	Design Criteria[2]	Expected Benefits of Control Measure Implementation	Project Start Date	Achieve Full Operation by December 31 of stated year
Gravity Interceptor from Pump Station 45 to Pump Station 7	Install 3,000 LF of 36" diameter gravity sewer from Pump Station 45 to Pump Station 7 to alleviate surcharging upstream of Pump Station 45	Reduces surcharge potential Reduces O&M requirements Increases pipe capacity for service population growth	2026	2027
Pump Station 50 Elimination	Decommission Pump Station 50	Reduces O&M requirements	2027	2032[3]
Wolcott WWTP Excess Flow Holding Basin	Construct 4 MG excess flow holding basin	Stores excess wet weather flows Reduces surcharge potential Reduces peak flows to Wolcott WWTP	2027	2032[3]
Mill Creek Basin Capacity Improvements	Replace existing gravity sewer with, or build parallel relief gravity sewer of, 10,000 LF of 15" – 60" diameter gravity sewer	Reduces surcharge potential Replaces aging pipe infrastructure	2031	2032
Pump Station 40 Capacity Improvements	Replace pump station infrastructure to increase firm capacity to 1,100 gpm	Reduces surcharge potential Reduces potential for pump station asset damage Replaces aging infrastructure Increases system reliability Increases capacity for service population growth	2031	2032

SSO Control Measure Name	Design Criteria[2]	Expected Benefits of Control Measure Implementation	Project Start Date	Achieve Full Operation by December 31 of stated year
Pump Stations 23, 24, 29, and 62 Capacity Improvements	Replace Pump Station 23 infrastructure and increase firm capacity from 100 gpm to 300 gpm Replace Pump Station 24 infrastructure to increase firm capacity from 329 gpm to 1,025 gpm Replace Pump Station 29 infrastructure to increase firm capacity from 100 gpm to 280 gpm Replace Pump Station 62 infrastructure to increase firm capacity from 168 gpm to 740 gpm	Reduces surcharge potential Increases capacity for service population growth	2031	2032
WWTP 20 Treatment Capacity Upgrade	Expand WWTP 20 to increase primary and secondary treatment capacity from 14 to 21 MGD avg. daily flow Install additional final clarifier, aerobic digester and aerobic sludge-holding basin	Reduces surcharge potential Reduces O&M requirements Increases capacity for service population growth Replaces aging infrastructure	2028	2032[3]
Wolcott WWTP, Phase 2	Increase treatment capacity from 2 to 4 MGD avg. daily flow	Provides additional capacity for service population growth	2027	2032[3]

SSO Control Measure Name	Design Criteria[2]	Expected Benefits of Control Measure Implementation	Project Start Date	Achieve Full Operation by December 31 of stated year
Basin Capacity Improvements for: Brenner Heights Creek, Brenner Heights Tributary, Turner Creek, and Turkey Creek	Construct gravity sewer capacity improvements listed below to replace aging pipe infrastructure: Brenner Heights Creek – 8,000 LF of 8" to 15" diameter Brenner Heights Tributary – 1,000 LF of 8" to 12" diameter Turner Creek – 1,000 LF of 8" diameter Turkey Creek – 200 LF of 15" diameter	Reduces surcharge potential	2031	2037
Pump Station 6 Storage	Construct new 0.6 MG excess flow holding basin	Reduces surcharge potential Increases capacity for service population growth	2034	2037
Pump Station 57 Force Main Capacity Improvements	Replace existing force main with installation of 2,000 LF of 6" diameter Force Main	Reduces surcharge potential Increases capacity for service population growth Replaces aging infrastructure	2033	2037
Pump Station 7 Storage	Construct a new 0.6 MG excess flow holding basin	Reduces surcharge potential Increases capacity for service population growth	2035	2037

SSO Control Measure Name	Design Criteria[2]	Expected Benefits of Control Measure Implementation	Project Start Date	Achieve Full Operation by December 31 of stated year
Pump Stations 25, 26, 27 and 55 Capacity Improvements	Replace Pump Station 25 infrastructure to increase firm capacity from 103 gpm to 300 gpm Replace Pump Station 26 infrastructure to increase firm capacity from 120 gpm to 520 gpm Replace Pump Station 27 infrastructure to increase firm capacity from 200 gpm to 340 gpm Replace Pump Station 55 infrastructure to increase firm capacity from 150 gpm to 208 gpm	Reduces surcharge potential Reduces potential for pump station asset damage Increases system reliability Increases capacity for service population growth Replaces aging infrastructure	2036	2037

Table 1.2 – SSS Performance Criteria

2-Year Storm Event Level of Service		5-Year Storm Event Level of Service	
SSS Basin	**Emergency Relief Structure Number**	**SSS Basin**	**Emergency Relief Structure Number**
Little Turkey Tributary North		East Mission Creek	
Little Turkey Tributary South	331-008-MH	Grinter Creek	
Mill Creek	292-003-PS	Little Turkey Creek North	
Eddy Creek	133-040-MH 132-012-MH 141-015-MH	Little Turkey Creek South	
Brenner Heights Creek	203-026-MH 204-026-MH 214-057-MH	Marshall Creek	320-023-MH 320-009-PS
Brenner Heights Tributary		Wolf Creek	
Muncie Creek	199-014-MH	Connor Creek	415-002-PS
Little Muncie		Honey Creek	
Turner Creek	185-033-PS	Island Creek	504-002-PS
Turkey Creek		Island Creek Tributary	
Brush Creek	020-101-MH 020-121-MH	Piper Creek	
		Morris Creek	
		Indian Creek	145-014-PS
		Santa Fe Bluff	
		Union Pacific Bottoms	
		Barber Creek	196-075-MH 196-120-MH

Table 2.1 – CSO Control Measures

CSO Control Measure Name	CSO(s) Addressed by Control Measure	Design Criteria*	Project Start Date	Achieve Full Operation by December 31 of stated year
CSO 19 Overflow Reduction	CSOs 19, 86 and 54	Localized sewer separation and green infrastructure to store up to 1.4" rainfall event	2018	2022, unless modified by an approved Jersey Creek CSO Control Measures Plan
Armourdale Phase 1 Sewer Separation (14th and Osage)	CSOs 41, 42, 43, 44 and 48	Construct 2,000 LF 12" through 30" storm sewer and 1,000 LF 8" through 15" sanitary sewer	2023	2027
Armourdale Phase 2 Sewer Separation (Central Armourdale)	CSOs 43, 44, 48 and 66	Install approximately 2,000 LF 12" through 24" storm sewer and 9,000 LF 8" through 24" sanitary sewer	2024	2027
Argentine to Armourdale Siphon Restoration (Junction Box and Gates)	CSO 48	Structural modification to accommodate new 20" sluice gate in each gatewell structure	2024	2027
CSO Control Measures Report with Annual Report due February 28, 2029				
Jersey Creek CSO Control Measure(s)**	CSOs 14, 15, 16, 17, 19, 55 and 81	TBD based on approved CSO Control Measures Plan (to be submitted by 12/31/2020)	TBD	TBD, but no later than 2032
CSO 47 Overflow Reduction	CSOs 47, 48, 43 and 44	Construct 4,000 LF 12" through 30" storm sewer and 500 LF 8" through 15" sanitary sewer	2028	2032
CSO 54 and CSO 86 Structural Improvements	CSOs 54 and 86	Raise CSO 54 weir 4 feet; raise CSO 86 weir 2 feet; and upsize pipe from CSO 54 diversion structure to FID PS to 60" diameter	2028	2032
CSO Control Measures Report with Annual Report due February 28, 2034				
CSO 55 Overflow Reduction	CSOs 55, 19, 86 and 54	Sewer separation and green infrastructure to provide wet weather storage for 1.4" rainfall event	2034	2037

CSO Control Measure Name	CSO(s) Addressed by Control Measure	Design Criteria*	Project Start Date	Achieve Full Operation by December 31 of stated year
FID Pump Station Downstream Sewer Capacity Improvements	CSOs 54 and 86	Increase capacity to FID PS to 30 MGD, rehabilitate existing 36" force main and construct parallel 30" force main	2033	2037
CSO Control Measures Report with Annual Report due February 28, 2039				
Esplanade Basin Overflow Reduction (Green Infrastructure/Sewer Separation)	CSOs 27, 28, 29, 30, 31, 56 and 54	Construct 19,000 LF 12" through 48" storm sewer and 17,000 LF 8" through 24" sanitary sewer	2038	2044
AID Pump Station Downstream Sewer Capacity Improvements	CSOs 43, 44, 48 and 39	Construct new parallel force main (24" dry weather, 42" wet weather) from AID PS under the Kansas River to the Kaw Point WWTP	2038	2044
Kaw Point WWTP High Rate Treatment (CES and Disinfection)	CSOs 54 and 44	Maintain 48 MGD capacity for secondary treatment, increase primary treatment capacity to 95 MGD with chemically enhanced settling process addition to existing clarifiers, provide additional disinfection capacity for approximately 47 MGD, and provide hydraulic capacity increase at plant headworks and outfall	2042	2044

* The Design Criteria are based upon Long-Term Control Plan-level planning estimates and may be subject to revision during facility planning and design. The Control Measures will be designed in accordance with good engineering practice to ensure that the system-wide Performance Criteria will be achieved.

** By no later than December 31, 2020, Unified Government will submit to EPA for review and approval CSO control measure(s) to reduce overflow activations at CSOs 14, 15, 16, 17, 19, 55 and 81 to no more than 4 to 6 overflows in the Design Year.

Table 2.2 – CSS Interim Performance Benchmarks

CSO Control Measure(s) Achieve Full Operation Date	**Interim Performance Benchmarks (Cumulative)** Design Year System-Wide CSO Overflow Volume
December 31, 2027	Reduce overflow discharge to no more than 680 MG
December 31, 2032	Reduce overflow discharge to no more than 647 MG
December 31, 2037	Reduce overflow discharge to no more than 635 MG

IV. Infrastructure Projects

25. This Section identifies Infrastructure Projects for the Sewer System and MS4 that the Unified Government shall implement that, where applicable, will coordinate with and/or enhance the SSO and/or CSO Control Measures pursuant to this IOCP, including: (a) Infrastructure Renewal projects to renew existing wastewater and stormwater infrastructure; most of these projects will be specifically identified during investigation and condition assessment efforts over time; (b) Infrastructure Upgrade projects to replace existing infrastructure with upgraded and/or larger capacity infrastructure; and (c) Implementation and Compliance projects to implement the IOCP, including program management, public outreach, flow monitoring, and post-construction implementation monitoring and reporting. The Unified Government shall implement the Infrastructure Projects identified in **Tables 3.1** through **3.3**, below, in accordance with the requirements and terms of this IOCP and the Consent Decree.

A. Recurring Infrastructure Renewal and Upgrade Projects

26. Projects identified in **Table 3.1**, below, describe the general types of infrastructure renewal and upgrade projects the Unified Government expects to perform on an annual or recurring basis. The Unified Government shall include as part of its Annual Report required pursuant to Section XII of the Consent Decree (Reporting, Certification and Approval of Submittals), Paragraph 60 project progress and completion information, relevant information

describing the nature and general scope of the expected work for Infrastructure Projects identified in **Table 3.1**, below, that will be implemented in the next reporting period, and any proposed changes to the schedule or scope of work for the Infrastructure Projects.

B. Specific Infrastructure Sewer System Renewal and Upgrade Projects

27. The Unified Government shall complete the scheduled specific infrastructure renewal and upgrade Projects identified in **Tables 3.2** and **3.3**, below, according to the schedule stated therein.

28. The Unified Government shall provide to EPA, for review and comment, any proposed changes to the schedule or scope of work for the Infrastructure Projects identified in **Tables 3.2** and **3.3**. Such proposed changes shall be included in the Annual Report required pursuant to Section XII of the Consent Decree (Reporting, Certification and Approval of Submittals), Paragraph 60, when possible, and submitted no later than ninety (90) days prior to the Unified Government's Construction Start Date for each such Project.

29. In the Annual Report required by Section XII of the Consent Decree (Reporting, Certification and Approval of Submittals), the Unified Government shall provide project progress and completion information for the Projects identified in **Tables 3.2** and **3.3**.

30. If requested, the Unified Government shall meet with the EPA on an annual basis to review the overall progress made towards achieving program implementation.

Table 3.1 – Recurring Infrastructure Renewal and Upgrade Projects

Infrastructure Renewal and Upgrade Projects Name	System Addressed by Project
Collection System Upgrade and Renewal	Separate Sewer System ("SSS") and Combined Sewer System ("CSS")
Pump Station and Force Main Upgrade and Renewal	SSS and CSS
Kaw Point WWTP Investigation and Repair	SSS and CSS
Plant 20 Investigation and Repair	SSS
Stormwater Preliminary Engineering Studies	MS4
Storm Sewer Upgrade and Renewal	MS4
Sewer Main Extensions	SSS and CSS
Stream Crossing Planning, Inspections and Repairs	SSS and CSS
WWTP 14 Investigation and Repair	SSS
Wolcott WWTP Investigation and Repair	SSS
Stream Bank Stabilization Improvements	SSS and CSS
Flood Control Improvements, Rehabilitation and Maintenance	CSS

Table 3.2 – Sewer System Infrastructure Renewal and Upgrade Projects

Infrastructure Renewal and Upgrade Projects Name	Project Start Date	Achieve Full Operation by December 31 of stated year
System-Wide SCADA Improvements	2018	2022
Pump Station 45 Chopper Pumps	2018	2022
Pump Stations 18, 5 and 4 Force Main Repair and Rehabilitation	2018	2022
Pump Station Back-Up Power Improvements	2018	2022
Plant 20 Equipment and Structural Improvements	2018	2022
Piper Creek Interceptor	2018	2022
Pump Stations 63 and 67 Capacity Improvements	2018	2022
Pump Station Nos. 76 and 77 Decommission and install approximately 1,000 LF 8" gravity sewer, and install 1,000 LF 6" Force Main	2019	2022
Pump Station 15 Decommission and install 1,800 LF 8" Gravity Sewer	2019	2022
Lombardy Drive Sanitary Sewer	2020	2022
Kaw Point WWTP Hydraulic Bottleneck Improvements	2024	2027
CID Septage Receiving Station Improvements	2026	2027
FID Pump Station Force Main Condition Assessment (and Renewal)	2027	2027
AID Pump Station Force Main Condition Assessment (and Renewal)	2027	2027
FID Pump Station Renewal	2028	2032
AID Pump Station Renewal	2034	2037

Table 3.3 – MS4 Infrastructure Renewal Projects

Infrastructure Renewal Projects Name	Project Start Date	Achieve Full Operation by December 31 of stated year
51st, N of Cleveland, Reinforced Concrete Box (RCB) Replacement	2018	2022
77th and Troup 96" Storm Replacement	2018	2022

V. Post-Construction Monitoring Program

A. Introduction

31. The Post-Construction Monitoring Program ("PCMP") is the method by which the Unified Government shall (a) demonstrate whether it has achieved the Interim Performance Benchmarks and Performance Criteria set forth in Section III of this IOCP for CSO and SSO Control Measures and (b) assess and document the impacts on receiving water quality that result from the implementation of the Control Measures.

32. The PCMP includes requirements to:

a. Measure the flow-reduction effectiveness of green infrastructure projects in the CSS;

b. Measure the performance of pump station and treatment facilities;

c. Verify the reduction or elimination of overflows at the sites listed in **Table 4.1** upon completion of the projects in the corresponding Sewersheds;

d. Measure and quantify the remaining inflow and infiltration ("I/I") in separated Sewersheds;

e. Measure the effectiveness of the program in meeting the CSS Interim Performance Benchmarks, the SSS Performance Criteria and the CSS Performance Criteria as the program progresses, to facilitate adaptive management of the program;

f. Update and re-calibrate the Sewer System hydraulic models based on post-construction monitoring; and

g. Physically verify SSO events by monitoring the emergency relief structures and known and model-predicted manhole overflows listed in **Table 4.2**.

B. Flow Monitoring

33. This PCMP shall supplement the Unified Government's existing wastewater system monitoring, including monitoring pursuant to Unified Government's National Pollutant Discharge Elimination System ("NPDES") Permits, and the Unified Government shall continue Permit-required flow monitoring. Under this PCMP, the Unified Government shall perform flow monitoring at key facilities and locations in the SSS and CSS during program implementation. The Unified Government shall utilize the same flow monitoring locations for post-monitoring that were utilized for hydraulic model calibration or other pre-construction monitoring to the maximum extent practicable. The flow data collected from these locations will enable a comparison of post-construction conditions with the baseline conditions of the hydraulic model calibrated during the development of the IOCP.

34. The Unified Government shall perform flow monitoring of major constructed facilities upon start-up of those facilities as detailed below. Major constructed facilities include Pump Station improvements, high rate treatment facilities, and upgrades to existing Wastewater Treatment Plants ("WWTP").

35. The Unified Government shall perform flow monitoring as detailed below to measure and evaluate the performance of SSO and CSO Control Measures, green infrastructure and sewer separation for the reduction of wet weather overflow volumes at the locations listed in **Tables 4.1** and **4.2** below. Green infrastructure will include those in

support of sewer separation projects and those that are stand-alone, if the project objective includes reduction of CSOs.

36. The Unified Government shall use level sensors, and where appropriate, flow meters or other reliable automated technology to monitor manhole level and verify the elimination of SSO activations up to the 2-year and 5-year design storm events using the calibrated hydraulic models consistent with Section III, **Table 1.2**, at the sites listed in **Table 4.2**.

37. The Unified Government shall develop specific locations for pre-construction short-term flow monitoring programs as necessary for the planning for these Sewer System Control Measures. These locations shall be highly specific to individual larger projects or groups of smaller projects included in a single construction contract, as appropriate.

38. The Unified Government shall include information regarding the flow monitoring locations, a summary of the results, and any conclusions drawn from the flow monitoring regarding the effectiveness of the project or series of projects, and a plan of action for flow monitoring for the upcoming reporting year in the Annual Report submitted pursuant to Section XII of the Consent Decree (Reporting, Certification and Approval of Submittals).

C. PCMP for CSO Controls

39. Kaw Point WWTP. In the corresponding spring/summer period following the Achieve Full Operation date for each CSO Control Measure at the Kaw Point WWTP, the Unified Government shall perform short-term (90 days minimum) flow monitoring within the interceptor where wastewater flows from the SSS enter the CSS, and permanent monitoring at the Kaw Point WWTP of influent flows to the plant, flows through the high-rate primary settling basins and through the new disinfection process, plus those flows receiving primary and secondary treatment and disinfection through the current process path. The Unified Government

shall also develop an updated wet weather plant operations protocol after completion of CSO Control Measures at the Kaw Point WWTP.

40. AID, FID, and CID Pump Stations. Each of these three critical CSS Pump Stations shall be equipped with new SCADA systems and rehabilitated to enable each Pump Station to reach its original design capacity as follows: FID capacity to 30.1 MGD, AID capacity to 53.4 MGD, and CID capacity to 11.5 MGD. In the corresponding spring/summer period following completion of each CSS Pump Station rehabilitation, the Unified Government shall use short-term (90 days minimum) flow meters within the interceptor where flows from the SSS enter the CSS, and permanent flow meters to continuously measure the flow pumped from each Pump Station in order to allow for the calculation of the total combined flow capture volume and capture percentage of the system in each Pump Station Sewershed and assist with calibration and validation of the CSS hydraulic model.

41. The Unified Government shall perform post-construction short-term (90 days minimum) flow metering at the sites listed in **Table 4.1** in the corresponding spring/summer period following the Achieve Full Operation date for the relevant Control Measures to evaluate flow reduction effectiveness of the Control Measures. In separated areas, the Unified Government shall use flow monitoring to quantify the remaining I/I in the SSS to allow better calibration of the wet-weather response in the system hydraulic model.

42. Summary. Data collected by the Unified Government through flow monitoring of selected CSO Outfalls, selected Sewer System locations, and major wet weather facilities, such as WWTPs, Pump Stations and high-rate treatment facilities shall

be used to determine the level of wet-weather capture achieved as implementation progresses. This data will support the following activities:

a. Characterization of sewer flow data for evaluation of long-term Sewer System performance;
b. Collection of information on overflows at critical CSS diversion structures and from CSO outfalls;
c. Determination of remaining I/I in the SSS that is tributary to the CSS for hydraulic model update and re-calibration;
d. Collection of additional data, such as performance at the AID, FID, and CID Pump Stations to ensure desired pumping capacities are restored;
e. Collection of flow data for potential use in future design efforts related to controlling both CSS and SSS Overflows;
f. Operation and maintenance actions to further control wet weather discharges and NPDES compliance; and
g. Collection of data for hydraulic model updates to support adaptive management of the CSO Control Measures to achieve Interim Performance Benchmarks and Performance Criteria and regulatory requirements.

43. The suite of CSS flow monitoring locations is presented in **Table 4.1**, below. The monitoring locations were selected to correspond to where overflow reduction is expected from CSO Control Measures as well as locations to evaluate long-term collection system performance and wet-weather capture volumes using the calibrated hydraulic model.

D. PCMP for SSO Controls

44. The following sections describe the PCMP for SSO Control Measures. The effectiveness of sanitary sewer system improvements shall be demonstrated utilizing the sewer

system hydraulic model developed by the Unified Government and through direct observation of SSOs at the locations identified in **Table 4.2**, below, representing the emergency relief structures and manholes that are susceptible to SSOs during significant storm events. The Unified Government shall conduct short-term level monitoring at these Sewer System locations for not less than 180 days commencing no later than April 1, 2021, to collect information to evaluate the effectiveness of the SSO Control Measures that will be implemented to achieve the targeted level of service. The flow monitoring data collected shall be used to re-calibrate and validate the hydraulic modeling of the sanitary sewer system.

45. Pump Station Overflows. A number of modeled and non-modeled Pump Stations have emergency relief structures with diversions either within the wet well or the manhole immediately upstream of the Pump Station. The Unified Government shall complete level sensing on the overflow lines from these Pump Station emergency relief structures to confirm the occurrence of any overflows at each location as indicated in the following paragraph. The Unified Government shall use this data to verify the level of service provided by the various SSO Control Measures using the calibrated hydraulic models.

46. The Unified Government has known emergency relief structures within its Sewer System to control surcharging in the system and protect adjacent homes from basement backups. Within six months of the Achieve Full Operation date for each SSO Control Measure in the separate sewer system tributary to each emergency relief structure the Unified Government shall commence long-term activation monitoring at the emergency relief structures listed in **Table 4.2**, below, and continue that monitoring for at least two years, to identify the effectiveness of such SSO Control Measures. Should the

annual rainfall in any of these years be more than 25-percent below or above the historical annual average, monitoring shall be extended for a third year. The Unified Government shall use tools, such as level-sensing devices, to monitor these manholes and log overflow events to provide data for recalibrating the hydraulic models to verify the 2-year and 5-year design storm level of service. Recorded data from level-sensing or other appropriate equipment that shows liquid levels exceeding the invert elevation of the diversion pipes shall be used to identify overflow events.

47. Rainfall Monitoring. Detailed analysis of precipitation data is necessary as a companion to the flow monitoring results to fully update the hydraulic model's response to rainfall and evaluate compliance with the Performance Criteria. Precipitation data of interest consists of total rainfall depth, duration, intensity and event distribution. Precipitation data will be sampled at 5-minute to 15-minute intervals to correspond with flow metering time steps.

48. The source of rainfall data will be rainfall gauges installed at an average density of not less than one gauge per 5 square miles throughout the Unified Government wastewater sewer service area to analyze SSO and Pump Station overflows to evaluate compliance with the SSS Performance Criteria in **Table 1.2** of this IOCP. To analyze pre- and post-construction project performance data, the source of rainfall data will be rainfall gauges, including some permanent rainfall gauges, installed at an average density of not less than one per 5 square miles in the wastewater basin tributary to each project. Additional rainfall data for localized, small-scale construction projects will be predominantly temporary rainfall gauges placed within the sewer service areas directly tributary to the flow monitoring area during the monitoring period. The Unified Government shall utilize the same rainfall gauge locations for post-construction monitoring that were utilized for baseline or other pre-construction monitoring to the maximum extent practicable.

E. Water Quality Monitoring and Assessment and PCMP Reports

49. Water Quality Monitoring. The Unified Government shall perform water quality monitoring and analysis three times during IOCP implementation. The water quality monitoring program shall include: an initial baseline sampling and monitoring period in the 2022 recreational season; a second mid-program sampling and monitoring period in 2033 after completion of the Wolcott WWTP and re-route of flow from PS 50, sewer separation projects in the Argentine and Armourdale Basins, and green infrastructure in CSO 19; and a final sampling and monitoring period at the completion of all CSO and SSO Control Measures in 2045.

50. Sampling Location and Parameters. The Unified Government shall conduct ambient stream monitoring at up to eleven locations including sites in the Kansas River, Missouri River, Jersey Creek, Mattoon Creek and Turkey Creek, and CSO monitoring at two overflows within the CSS, as specified in Table 2-1 and Figure 2-1 in Appendix D, *Water Quality Monitoring Program Sampling and Analysis Plan*, dated February 5, 2013, of the Unified Government's March 2013 *Sewer System Evaluation ("SSE") Work Plan*. For the Parties' convenience, the Unified Government's *Water Quality Monitoring Program Sampling and Analysis Plan*, dated February 5, 2013 is attached as Appendix A of this IOCP. These locations were selected to characterize water quality conditions upstream and downstream of CSO impacts and support the development and calibration of water quality models. Site accessibility and safety were also considered in location selection.

51. The Unified Government shall record field measurements of water temperature, pH, and dissolved oxygen at each monitoring site using calibrated water quality meters. Concurrent with field measurements, observations shall be made and recorded at each

monitoring location related to weather, aesthetic impacts and evidence of recreational use. Water samples for laboratory analysis shall be collected immediately following field measurements at a monitoring site. The Unified Government shall conduct sampling during the months of April through October, to coincide with the recreation season, in accordance with the sampling procedures and protocols stated in Appendix D to the Unified Government's 2013 *SSE Work Plan* (Appendix A to this IOCP). The samples at each site shall be analyzed for the parameters listed in Table 2-2 to Appendix A to this IOCP (*SSE Work Plan,* Appendix D).

52. Control Measures Report. The Unified Government shall use data from the PCMP to evaluate the effectiveness of SSO and CSO Control Measures identified in **Tables 1.1** and **2.1** in Section III of this IOCP to determine whether the SSS Performance Criteria identified in Section III, **Table 1.2**, and the CSS Interim Performance Benchmarks identified in **Table 2.2**, have been achieved. The Control Measures Report detailing the results and progress of the PCMP shall be included in the Annual Report, submitted pursuant to Section XII of the Consent Decree (Reporting, Certification and Approval of Submittals), for the Calendar Year following each Achieve Full Operation deadline for SSO Control Measures in **Table 1.1** and each CSS Interim Performance Benchmark period in **Table 2.2**. This report shall include a summary of SSS and CSS basin performance to-date, consisting of:

a. Status of Sewer System Control Measures implementation;

b. SSS and CSS flow monitoring performed;

c. Summary of flow monitoring results obtained in the report year;

d. Documentation of model modifications, re-calibration and re-verification performed in the report year;

e. Identification and documentation of model-based SSO and CSO reductions achieved by Control Measures and applicable Infrastructure Projects constructed up to and including the report year; and

f. Comparison of results verified by post-construction flow monitoring versus results predicted by the model at the time of IOCP development.

53. If, following post-construction monitoring, the analysis indicates that any SSO Control Measure identified in **Table 1.1**, above, fails to achieve the Level of Service identified in **Table 1.2**, or that one or more of the CSS Interim Performance Benchmarks in **Table 2.2**, will not be achieved by the dates specified, the Unified Government shall submit to EPA, for review and approval, a SCP in accordance with Section III of this IOCP as part of the Control Measures Report.

54. Water Quality Standards Assessment. In addition to the evaluation of the Performance Criteria, the Unified Government shall collect information on the impact of remaining CSOs on achievement of water quality standards and the current NPDES permit requirements. The sampling data and water quality model should also evaluate the extent to which the remaining CSOs impact achievement of water quality criteria if background sources of pollution were eliminated and reduced.

55. A goal of collecting sampling data is to determine the effects of the remaining CSOs on receiving water quality and achievement of prevailing water quality standards. For example, are the CSO discharges causing exceedances of water quality criteria? Or, to the extent that criteria are already being exceeded due to upstream sources, are the remaining CSOs increasing the magnitude of exceedances of water quality criteria? Have enough sampling results been collected to calculate a geometric mean E. coli concentration consistent with applicable water quality standards? Whether

the water quality standards are achieved shall be decided on a case by case basis in consultation with the EPA and the Kansas Department of Health and Environment ("KDHE").

56. Final Post-Construction Monitoring Report. No later than December 31, 2046 the Unified Government shall submit to the EPA a final Post-Construction Monitoring Report for EPA review and approval in accordance with Section XII of the Consent Decree, which shall:

a. Demonstrate that the Unified Government completed the requirements of the PCMP;

b. Evaluate whether the Sewer System Control Measures implemented pursuant to this IOCP meet the Performance Criteria of the IOCP;

c. Include a Water Quality Standards Assessment Report Related to Post-Construction Compliance Monitoring, setting forth its conclusions as to whether the Unified Government is meeting the NPDES permit-based requirements and is achieving compliance with applicable water quality standards, including whether the Sewer System Control Measures pursuant to Section III of this IOCP, as constructed, operated, or otherwise implemented, have achieved the Performance Criteria, and the Objectives set forth in Section III of the Consent Decree, specifically with regard to: (i) full compliance with NPDES permits, the CWA, the Kansas public health statutes, and their regulations; (ii) compliance with the CSO Policy, including compliance with applicable state water quality standards; (iii) the elimination of SSOs and Unauthorized CSOs; and (iv) the elimination of bypasses prohibited by 40 C.F.R. § 122.41(m);

d. Summarize the data collected during the entirety of the monitoring period and include any new data relevant to the evaluation that the Unified Government did not previously submit to EPA;

e. If model or monitoring results show that the Unified Government's Sewer System Control Measures did not meet the Performance Criteria or Objectives, the Unified Government shall identify and describe in detail deficiencies or performance-limiting factors in system design, process, operations, and maintenance that may have limited the ability of the Sewer System Control Measures to achieve their intended performance; and

f. Thereafter, the Unified Government shall identify and describe in detail all necessary and feasible Corrective Measures, alternative operating strategies and additional facilities and processes necessary to meet the Performance Criteria and Objectives.

Table 4.1 – CSS Flow Monitoring Sites and Schedules

Flow Monitoring Location(s)	Relevant Control Measures	Comment
Kaw Point WWTP	Kaw Point WWTP High Rate Treatment	Plant influent and effluent through biological process and disinfection is currently continuously metered
CID Pump Station	AID and FID PS Downstream Sewer Capacity Improvements	New effluent flow meter
FID Pump Station	AID and FID PS Downstream Sewer Capacity Improvements	New effluent flow meter
AID Pump Station	AID and FID PS Downstream Sewer Capacity Improvements	New effluent flow meter
CSO 19 Outfall	CSO 19 Overflow Reduction	Monitor outfall and CSS upstream of diversion structure
CSO 55 Outfall	CSO 55 Overflow Reduction	Monitor outfall and CSS upstream of diversion structure
CSO 41, 42, 43, 44, 47, 48, 66 Outfalls	Armourdale Phase 1 and 2 Separation, CSO 47 Overflow Reduction, Argentine to Armourdale Siphon Restoration AID PS Capacity Upgrade	Monitor all outfall pipes from each diversion structure and upstream of diversion structures
CSO 27, 28, 29 Outfalls	Esplanade Basin Overflow Reduction	Monitor all outfall pipes from each diversion structure and upstream of diversion structures
CSO 30, 31, 56 Outfalls	Esplanade Basin Overflow Reduction	Monitor all outfall pipes from each diversion structure and upstream of diversion structures
CSO 54, 86 Outfalls	CSO 19 Overflow Reduction, CSO 55 Overflow Reduction, Esplanade Basin Overflow Reduction, FID PS Capacity Upgrade, CSO 54 and CSO 86 Structural Improvements	Monitor all outfall pipes from each diversion structure and upstream of diversion structures

Flow Monitoring Location(s)	Relevant Control Measures	Comment
Jersey Creek CSO Outfalls	TBD based on approved CSO Control Measures Plan (to be submitted by 12/31/2020)	TBD
Within the interceptor where wastewater flows from the SSS enter the CSS	Kaw Point WWTP High Rate Treatment, FID PS Capacity Upgrade, AID PS Capacity Upgrade, CID PS Capacity Upgrade	

Table 4.2 - Emergency Relief Structure Inventory

SSO Index Number[1] and Outfall Structure No.	Emergency Relief Structure Number	Structure Type	Pump Station ID and Facility Number	Structure/Pump Station Location	Basin	SSS Model Status	Approximate Overflow Elevation	Anticipated Overflow Elimination/Closure Impact[6]
BHC-0005 203-076-DP	203-026-MH	Diversion Pipe (8-inch dia.)	NA	2324 North 57th Terrace	Brenner Heights Creek	SSO included in SSS (Kaw Point WWTP) model.	853.93	Surcharging along Nogard Avenue and potential basement backups.
BHC-0008 204-094-DP	204-026-MH	Diversion Pipe (10-inch dia.)	NA	North 55th Street and Lathrop Avenue	Brenner Heights Creek	SSO included in SSS (Kaw Point WWTP) model.	910.479	Surcharging up to Leavenworth Road, potential impact to businesses and residents.
BHC-0007 214-078-DP	214-057-MH	Diversion Pipe (10-inch dia.)	NA	North 62nd Street and Haskell Avenue	Brenner Heights Creek	SSO included in SSS (Kaw Point WWTP) model.	851.95	Surcharging on 62nd Street and Cleveland Avenue through residential area and potential basement backups.
MTC-0003 110-155-DP	110-046-MH[5]	Diversion Pipe (8-inch dia.)	NA	North 29th Street and Ohio Avenue	Mattoon Creek	SSO included in SSS (Kaw Point WWTP) model.	834.883	Surcharging on 29th Street and Ohio Avenue through residential area and potential basement backups.
LTTS-0001 331-016-DP	331-008-MH	Constructed Overflow: Diversion Pipe (18-inch dia. with flap gate)	6 331-001-PS	8620 Kaw Drive	Little Turkey Tributary South	SSO included in SSS (Plant 20 and Wolcott WWTP) model.	2-yr – 752.1 ft (EFHB activated) 5-yr – 753.6 ft (EFHB storing 0.6MG) 10-yr – 753.84 ft (EFHB storing 0.6MG)	2-yr – no SSO (as expected). Basin barely activates storing ~ 0.06 MG. 5-yr – 3.45 MG SSO at MH 295-002 and 302-003 on east interceptor to river. Basin stores ~ 0.6 MG. Overflow would likely ultimately reach the Kansas River through the same tributary creek that the constructed overflow discharges to.

SSO Index Number[1] and Outfall Structure No.	Emergency Relief Structure Number	Structure Type	Pump Station ID and Facility Number	Structure/Pump Station Location	Basin	SSS Model Status	Approximate Overflow Elevation	Anticipated Overflow Elimination/Closure Impact[6]
								10-yr – 6.85 MG SSO at MH 295-002, 302-003 and 95-003 on east interceptor to river. Basin stores ~ 0.6 MG. Overflow would likely ultimately reach the Kansas River through the same tributary creek that the constructed overflow discharges to.
MNC-0001 198-005-DP 198-006-DP	199-014-MH	Constructed Overflow: Weir (21-inch dia.)	7 199-015-PS	5611 Kaw Drive	Muncie Creek	SSO included in SSS (Kaw Point WWTP) model.	748.687	Surcharging from PS 7 to PS 45. During high flows PS 7 will become inundated with flow.
MLC-0002 292-039-DP	292-003-PS	Constructed Overflow: Diversion Pipe (8-inch dia.)	8 292-003-PS	7544 Richland Avenue	Mill Creek	SSO not included in SSS model; evaluated per non-modeled sewershed analysis.[2]	None available in GIS Approx. Rim EL = 886	Potential basement backups and/or an SSO at the pump station, which is located in a residential area close to a home.
MSC-0007[1] 320-053-DP	320-023-MH	Constructed Overflow: EFHB Diversion Pipe (8-inch dia.)	10 320-024-PS	3120 North 83rd Street	Marshall Creek	SSO not included in SSS model; evaluated per non-modeled sewershed analysis.[2]	None available in GIS Approx. Rim EL = 948	This is a diversion pipe to the EFHB which is designed to store excess peak flows to Pump Station 16. If this was removed it would lead to an SSO in a rural area (not a basement backup) and impact would be minimal.

SSO Index Number[1] and Outfall Structure No.	Emergency Relief Structure Number	Structure Type	Pump Station ID and Facility Number	Structure/Pump Station Location	Basin	SSS Model Status	Approximate Overflow Elevation	Anticipated Overflow Elimination/Closure Impact[6]
ISC-0001 504-009-DP	504-002-PS[5]	Constructed Overflow: EFHB Diversion Pipe (6-inch dia.)	16 504-002-PS	11800 Polfer Road	Island Creek	SSO included in SSS (Plant 20 and Wolcott WWTP) model.	None available in GIS Approx. Rim EL = 804	This is a diversion pipe to the EFHB which is designed to store excess peak flows to Pump Station 16. Plugging this diversion pipe would lead to SSOs and potential basement backups upstream of Pump Station 16.
BBC-0001[1] 196-136-DP	196-075-MH	Constructed Overflow: Diversion Pipe (18-inch dia.)	18 196-121-PS	5830 Inland Drive	Barber Creek	SSO included in SSS (Kaw Point WWTP) model.	765.78	Surcharging along Inland Drive near 57th Terrace in residential area, potential basement backups.
BBC-0001[1] 196-078-DP	196-120-MH[5]	Constructed Overflow: Lagoon Overflow Line (18-inch dia.)	18 196-121-PS	5830 Inland Drive	Barber Creek	SSO included in SSS (Kaw Point WWTP) model.	764.5 (Weir plate set at 765.37)	Surcharging along Inland Drive near 57th Terrace in residential area, potential basement backups.
TNC-0008 160-062-DP	185-033-PS[5]	Constructed Overflow: Diversion Pipe (8-inch dia.)	21 185-033-PS	897 South 51st Street	Turner Creek	SSO included in SSS (Kaw Point WWTP) model.	776.59	Pump Station 21 wet well will overtop.
EDC-0004 133-104-DP	133-040-MH	Constructed Overflow: Diversion Pipe (10-inch dia.)	26 133-039-PS	3231 North 38th Street	Eddy Creek	SSO not included in SSS model; evaluated per non-modeled sewershed analysis.[2]	875.46	Pump Station 26 wet well will overtop; located in residential area, potential basement backups.
EDC-0003 132-085-DP	132-012-MH	Constructed Overflow: Diversion Pipe (8-inch dia.)	27 132-010-PS	2998 North 42nd Street	Eddy Creek	SSO not included in SSS model; evaluated per non-modeled sewershed analysis.[2]	None available in GIS	Pump Station 27 wet well will overtop.

SSO Index Number[1] and Outfall Structure No.	Emergency Relief Structure Number	Structure Type	Pump Station ID and Facility Number	Structure/Pump Station Location	Basin	SSS Model Status	Approximate Overflow Elevation	Anticipated Overflow Elimination/Closure Impact[6]
EDC-0002 141-088-DP	141-015-MH[5]	Constructed Overflow: Diversion Pipe (6-inch dia.)	28 141-014-PS	2830 North 44th Street	Eddy Creek	SSO not included in SSS model; evaluated per non-modeled sewershed analysis.[2]	None available in GIS	Pump Station 28 wet well will overtop.
MSC-0007[1] 320-052-DP	320-009-PS	Constructed Overflow: Diversion Pipe (8-inch dia.)	30 320-009-PS	3240 North 84th Place	Marshall Creek	SSO not included in SSS model; evaluated per non-modeled sewershed analysis.[2]	None available in GIS Approx. Rim EL = 950	Potential basement backups and/or an SSO at the pump station, which is located in a residential area between two homes.
INC-0004 145-582-DP	145-014-PS[5]	Constructed Overflow: Diversion Pipe (10-inch dia.)	35 145-014-PS	4332 State Avenue	Indian Creek	SSO included in SSS (Kaw Point WWTP) model.	898.00	Pump Station 35 wet well will overtop.
BUC-0001[1] 020-101-DP	020-101-MH[3], [5]	Constructed Overflow: (15-inch dia.)	37 020-122-PS	4607 Cambridge Street	Brush Creek	SSO included in SSS (Plant 20 and Wolcott WWTP) model.	892.36	Significant surcharging at 46th Avenue and Stateline Road, potential basement backups.
BUC-0001[1] 020-121-DP	020-121-MH[5]	Constructed Overflow: Weir (21-inch dia.)	37 020-122-PS	4607 Cambridge Street	Brush Creek	SSO included in SSS (Kaw Point WWTP) model.	893.793	Significant surcharging at 46th Avenue and Stateline Road, potential basement backups.
ARG-0001 048-040-DP	048-040-MH	Constructed Overflow: (12-inch dia.)	40 048-038-PS	625 Metropolitan Avenue	Argentine	SSO included in SSS (Kaw Point WWTP) model.	751.454	Pump Station 40 wet well will overtop, and surcharging will occur along 7th Street Trafficway, potential basement backups.

SSO Index Number[1] and Outfall Structure No.	Emergency Relief Structure Number	Structure Type	Pump Station ID and Facility Number	Structure/Pump Station Location	Basin	SSS Model Status	Approximate Overflow Elevation	Anticipated Overflow Elimination/Closure Impact[6]
CC-0001 415-005-DP	415-002-PS[5]	Constructed Overflow: Valve Controlled Pipe (12-inch dia.)	70 415-002-PS	5425 North 99th Street	Connor Creek	SSO included in SSS (Plant 20 and Wolcott WWTP) model.[4]	None available in GIS Approx. Rim EL = 770	Overflow to Connor Creek (assuming the valve is opened).

[1]Duplicate SSO index number.

[2]Structure was evaluated through the non-modeled sewershed analysis, i.e., structure was not evaluated through hydraulic modeling. Refer to the methodology provided in Section 4.6 of the *SSS Characterization Report*.

[3]Emergency relief structure discharges to the Kansas City, Missouri, sewer system.

[4]Emergency relief structure was modeled as closed because the shut-off valve on the overflow pipe from the pump station wet well is normally closed.

[5]Emergency relief structure does not activate during the modeled two-year storm event.

[6]Anticipated overflow elimination/closure impact based on the planning level SSS model and non-modeled sewershed analysis.

VI. Summary of Reporting Requirements

57. Beginning with Calendar Year 2020, the Unified Government may include all information required pursuant to Paragraphs 60(b) and 60(c) of the Consent Decree for the period of January 1 through December 31 each year in the Annual Report, and cease submitting a Semiannual Report on August 15. The first such Annual Report shall be submitted for the period from January 1 to December 31, 2020, no later than February 28, 2021, and shall include all information required by Paragraphs 60(b) and 60(c) of the Consent Decree. Succeeding Annual Reports shall be submitted no later than February 28 of each year until termination of the Consent Decree.

58. The information in **Table 5.1**, below, is a summary of the reporting requirements in Sections III through V of this IOCP and the corresponding reporting provision of Section XII (Reporting, Certification and Approval of Submittals) of the Consent Decree. This information is provided for the convenience of the Parties and does not change the underlying reporting requirements of the Consent Decree.

59. The Unified Government shall maintain on its website until termination of the Consent Decree an updated copy of **Tables 1.1, 1.2, 2.1, 2.2, 3.2** and **3.3** in Sections III and IV of this IOCP listing all approved Control Measures, Projects and associated schedules.

Table 5.1 – Summary of Reporting Requirements for IOCP Implementation

IOCP Paragraph	Consent Decree Section XII, Paragraph No.	Report or Date	Requirement
2		December 31, 2020	Jersey Creek proposed CSO Control Measures
6	60(c)	Annual Report	updated project information for each SSO Control Measure
8	60(c)	Annual Report	updated project information for each CSO Control Measure
9		90 Days prior to Construction Start Date	deleted, revised and/or alternative Control Measure(s) in lieu of the specific SSO and CSO Control Measures
13, 52	60(c)	Annual Report	Control Measures Report – SSOs
14, 52	60(c)	Annual Report	Control Measures Report – CSOs
15	60(c)	By no later than August 31 immediately following submittal of the Control Measures Report	Supplemental Compliance Plan
26	60(b)(iii)	Annual Report	relevant information describing the nature and general scope of the expected Work for the Infrastructure Projects identified in **Table 3.1**
26	60(c)	Annual Report	project progress and completion information for the Infrastructure Projects identified in **Table 3.1**
28	60(c)	Annual Report, if possible, but no later than 90 Days prior to Construction Start Date	any proposed changes to schedule or scope of work for the Infrastructure Projects identified in **Table 3.2** and **Table 3.3**
29	60(c)	Annual Report	project progress and completion information for the Infrastructure Projects identified in **Table 3.2** and **Table 3.3**
38	60(c)	Annual Report	flow monitoring locations, a summary of the results, and any conclusions drawn from the flow monitoring regarding the effectiveness of the project or series of projects, and a plan of action for flow monitoring for the upcoming reporting year
56		December 31, 2046	Final Post Construction Monitoring Report with Water Quality Standards Assessment Report

VII. Design Year for the Combined Sewer System

60. The following information is an excerpt from the Unified Government's *DRAFT Combined Sewer System (CSS) Characterization Report, Unified Government of Wyandotte County and Kansas City, Kansas Integrated Overflow Control Program, May 31, 2015.* This information is included in this IOCP for the convenience of the Parties in implementing the IOCP.

3.3 Design Storm and Design Year Development

An evaluation of precipitation data was completed to define typical rainfall distribution patterns and recurrence intervals. Historical precipitation data was utilized to develop design storms and the Design Year that was applied when modeling the existing conditions and alternative control scenarios.

There was no long-term, continuous precipitation data available directly in the CSS area. However, continuous, long-term precipitation data for the Kansas City International (KCI) Airport was available from the National Climatic Data Center (NCDC). The KCI Airport data set provided 38 continuous and complete years (1973-2010) of hourly precipitation data with a precision of 0.01-inch. Precipitation patterns are expected to be similar at KCI and within the CSS area because of their proximity and the absence of significant landscape features, which would cause differences.

3.3.1 Precipitation Event Characteristics

An analysis of the KCI Airport precipitation data for the 1973 to 2010 period was conducted to define design storm events. Continuous hourly data were used to evaluate storm event depth, intensity, and duration. For purposes of defining an "event" for use in the precipitation data analysis, a minimum inter-event time (MIT) of 12 hours was applied to

delineate precipitation events. The MIT refers to a minimum period of dry weather (i.e., characterized by no measurable rainfall) that delineates sequential storm events.

Return periods for design storms were selected to represent a finite set of storms covering the range of storms expected in a typical year and for incrementally sizing and assessing control alternatives. A MIT of 12 hours was selected based on a review of literature, expectations for the time it takes for the CSS to return to normal baseflow conditions following the cessation of precipitation, and consistency with the MIT selected for the Kansas City, Missouri, design storm analysis.

3.3.2 Design Storms

Using the KCI Airport data set and a 12-hour MIT, precipitation events were defined and return periods for event precipitation depth (in) and peak hourly intensity (in/hr) were calculated using a partial duration series consistent with the Weibull rank-order approach (McCuen, 1989). As provided in the *SSE Work Plan*, Table 3-1 presents a summary of the design storm return periods, storm depth, peak hourly intensity, and storm duration; the number of expected events in a typical year; and the number of events exceeding the design storm in a typical year. These values are based on averages from the precipitation record for the historical period. These eight design storms were used to evaluate a range of CSO controls. Additional commentary on development of the design storms is provided in Appendix A of the *SSE Work Plan*.

Table 3-1: Design Storms

Design Storm ID	Return Period (months)	Total Event Depth (in)	Peak Hourly Intensity (in/hr)	Storm Duration (hrs)	Number of Events per Year[1]	Events Equal or Exceeding per Year[2]
A	0.33	0.25	0.10	7.25	18	36
B	0.67	0.68	0.26	12.50	6	18
C	1	0.94	0.38	14.75	6	12
D	2	1.42	0.61	18.50	2	6
E	3	1.84	0.78	21.25	1	4
F	4	2.10	0.86	22.75	1	3
G	6	2.35	0.98	24.25	1	2
H	12	3.23	1.18	28.75	1	1

Notes:
1. Total number of events per year with the same, or very similar, depth/peak hourly intensity/duration characteristics as that of the specified design storm.
2. Total number of events per year with total depths and peak hourly intensities equal to or exceeding the specified design storm depth and intensity.

3.3.3 Design Year

The Design Year was then developed to represent conditions expected in a typical or "average" year. Precipitation data for 2001 (an "average" year) was evaluated to assess event distribution on an annual and seasonal basis. Design storms were utilized to mimic the event distribution on an annual and seasonal basis resulting in the Design Year. Additional commentary on development of the Design Year is provided in Appendix A of the *SSE Work Plan*.

Water Quality Monitoring Program Sampling and Analysis Plan

Unified Government of Wyandotte County
Kansas City, Kansas

February 5, 2013

Water Quality Monitoring Program
Sampling and Analysis Plan

prepared for

Unified Government of Wyandotte County
Kansas City, Kansas

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1.0 INTRODUCTION AND OBJECTIVES

The Unified Government of Wyandotte County/Kansas City, Kansas (UG) is developing an Integrated (combined sewer and sanitary sewer) Overflow Control Plan (IOCP) as part of a commitment to protecting water resources in its watersheds and providing compliance with State and federal regulations governing water quality. This Sampling and Analysis Plan (SAP) was developed to provide practical assistance in obtaining representative and reliable water quality data in a technically sound, safe and cost-effective manner.

The SAP is designed to collect data that will be used to assess water quality concerns associated with CSOs and support the development of the IOCP. The objective is to further characterize CSO impacts on the receiving waters, namely Jersey Creek, Mattoon Creek, the Kansas River, and the Missouri River, and inform the decision-making process for determining an appropriate level of CSO control.

The UG's monitoring program will start in the spring of 2013 and the work will be contracted to LimnoTech Inc. Sampling and analysis efforts will be conducted in accordance with this SAP, the associated Quality Assurance Project Plan (LimnoTech, 2013), the Laboratory's Quality Assurance Manual, and a Health and Safety Plan (HASP). The Quality Assurance Project Plan (QAPP) and Quality Assurance Manual include information on responsibilities, sampling procedures, quality control checks, data management and reporting. The HASP includes information on responsibilities, safe work practices, hazards and controls, and emergency procedures. Any UG or LimnoTech contractors must operate under their own HASP.

This SAP is divided into the following sections:

- Introduction and Objectives
- Water Quality Monitoring
- Field Methods and Procedures
- Quality Control
- Program Safety

* * * * *

2.0 WATER QUALITY MONITORING

This section presents the monitoring locations, parameters, and the schedule for the monitoring program.

2.1 SAMPLING LOCATIONS AND PARAMETERS

Ambient stream monitoring will be conducted at up to eleven (11) locations including sites in the Kansas River, Missouri River, Jersey Creek, Mattoon Creek and Turkey Creek. CSO monitoring will be conducted at two (2) overflows within UG combined sewer system (CSS). The sampling locations are listed in Table 2-1 and are depicted on Figure 2-1. These locations were selected to characterize water quality conditions upstream and downstream of CSO impacts and support the development and calibration of water quality models. Site accessibility and safety were also considered in location selection.

Field measurements of water temperature, pH, and dissolved oxygen will be recorded at each monitoring site using calibrated water quality meters. Concurrent with field measurements, observations will be made and recorded at each monitoring location related to weather, aesthetic impacts and evidence of recreational use. Immediately following field measurements at a monitoring site, water samples will be collected for laboratory analysis. The samples collected at each site will be analyzed for the parameters shown in Table 2-2. Additional information on field methods and procedures is presented in Section 3 of this document.

Table 2-1 Sampling Locations

Station ID	Receiving Water	Location Description	Purpose
MR-01	Missouri River	Upstream of I-635 bridge (39° 9'15.08"N, 94°39'4.63"W)	Characterize conditions upstream of UG CSO discharges
MR-02	Missouri River	Upstream of confluence with Kansas River (39° 7'7.50"N, 94°36'28.21"W)	Characterize conditions upstream of confluence with Kansas River, including upstream UG CSOs
MR-03	Missouri River	At State Line, downstream of Kansas River, upstream of KAW Point WWTP outfall (39° 6'49.74"N, 94°36'26.35"W)	Characterize Missouri River conditions downstream of all UG CSOs
KR-01	Kansas River	Upstream of I-635 bridge (39° 5'58.68"N, 94°40'49.24"W)	Characterize conditions upstream of UG CSO discharges
KR-02	Kansas River	Near mouth of river (39° 6'51.72"N, 94°36'48.76"W)	Characterize conditions upstream of confluence with Missouri River, including UG CSOs upstream
MC-01	Mattoon Creek	Outlet at Kansas River (39° 5'43.45"N, 94°40'15.70"W)	Characterize stream water quality, including stormwater runoff and UG CSOs
TC-01	Turkey Creek	Outlet at Kansas River (39° 4'37.12"N, 94°37'7.66"W)	Characterize stream water quality, including stormwater runoff
JC-01	South Fork Jersey Creek	Upstream of 29th St. (39° 7'19.49"N, 94°39'42.84"W)	Characterize stream water quality, including stormwater runoff, upstream of UG CSOs
JC-02	Jersey Creek	At N. 16th St. (39° 7'43.34"N, 94°38'50.97"W)	Characterize stream water quality, including stormwater runoff and UG CSOs
JC-03	Jersey Creek	At N. 3rd St. (39° 7'16.99"N, 94°36'58.65"W)	Characterize stream water quality, including stormwater runoff and UG CSOs
EC-01	Esplanade Creek	Outlet structure at Missouri River and Levee Rd (39° 9'12.01"N, 94°37'51.97"W)	Characterize stream water quality, including stormwater runoff and UG CSOs
CSO-54*	CSO 54	CSO 54 overflow diversion structure, W. of Fairfax Trafficway at Levee Rd. access, N. of River City Dr. (39° 7'17.24"N, 94°36'42.14"W)	Characterize water quality in UG CSO from a primarily industrial service area
CSO-44*	CSO 44	CSO 44 overflow diversion structure, Levee Rd. N. of Central Ave. (39° 6'22.84"N, 94°37'6.64"W)	Characterize water quality in UG CSO from a primarily residential service area

* Samples will be collected at an accessible location downstream of the diversion structure

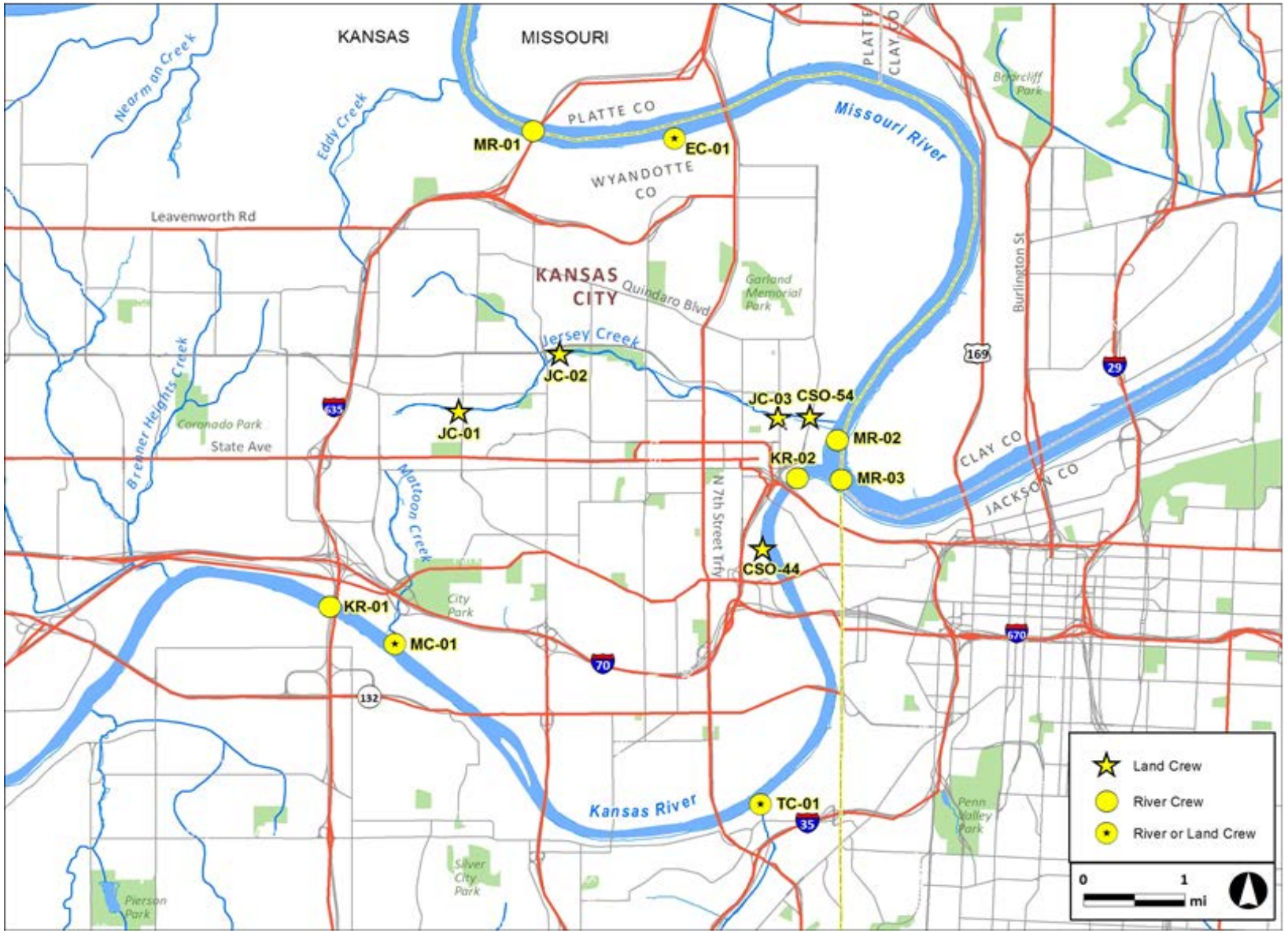

Figure 2-1 Water Quality Sampling Locations

Table 2-2 Analytical and Field Parameters

Analytical Parameters
• *E. coli* • Total Suspended Solids (TSS) • Total Metals (Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc) • Total Hardness
Field Measurements
• Water Temperature • Dissolved Oxygen • pH
Field Observations
• Weather • Aesthetic impacts • Evidence of recreational use

2.2 SAMPLING SCHEDULE

Sampling will be conducted during the months of April through October to coincide with the recreation season and characterize water quality during critical warm weather periods. Sampling will be conducted at each location during seven (7) monthly routine events and three (3) wet weather events, according to the protocols described in this SAP.

2.3 ROUTINE EVENTS

Seven (7) routine sampling events will be conducted over the study period and will consist of a single round of sampling conducted at each of the sampling locations. If flowing water is not present at a location at the time of a routine event, this will be recorded in the field notes and no field measurements will be taken and no sample will be collected. If flowing water is present, field measurements will be taken and samples will be collected and submitted for laboratory analysis consistent with the methods presented in Section 3.

Routine events will be scheduled to occur once monthly from April through October. All locations will be sampled within a 48 hour period during a routine event. A routine event will not be conducted unless a minimum of two weeks has passed since the previous routine event.

Sampling will be conducted using a two-person crew in a boat for the large river sites. A one or two person crew will be used for land-based sampling of stream and CSO locations. All sampling will be performed when safe to do so.

2.4 WET WEATHER EVENTS

Three (3) wet weather events will be conducted over the study period. Details of the Wet Weather Sampling Protocol are presented in the following subsection of this document. Every attempt will be made to sample storms that meet the criteria used to define a wet weather event, as follows:

- No local precipitation within 72 hours before the event; and,
- A minimum of 0.50 inches of rainfall over a six-hour period.

A wet weather event will be initiated by the LimnoTech Field Manager, or designee, based on a forecast that the above criteria will be satisfied. The LimnoTech Project Manager will notify the IOCP Program Manager and UG that a wet weather event is being initiated.

The wet weather criteria will serve as the minimum requirements for initiating a wet weather sampling event. Local conditions may require these criteria to be modified as the study progresses. Best professional judgment will be necessary to assess the suitability of a particular wet weather sampling event.

Sampling intervals are discussed below. These intervals may be adjusted to address each distinct wet weather event.

Wet Weather CSO Sampling Intervals. At CSO overflow locations three (3) rounds of sampling will be conducted at each location during the course of a wet weather event. The intent will be to collect the first sample as close as possible to the initiation of overflow. Collection of the second sample will be targeted to occur between 2 and 4 hours after the first sample, and collection of the third sample will again be targeted to occur between 2 and 4 hours after the second sample. It is important to note that not every CSO will necessarily overflow during a wet weather event and a CSO may not discharge long enough for collection of three individual samples during a single event. Only active CSOs will be sampled during each wet weather sampling event. These samples will serve to evaluate first flush conditions as well as develop event mean concentrations for CSOs.

Wet Weather Stream Sampling Intervals. At each stream location three (3) rounds of sampling will be conducted during each wet weather sampling event. The intent will be to collect the first sample as close as possible to the initiation of precipitation. Collection of the second sample will be targeted to occur between 6 and 24 hours after the first sample, and collection of the third sample will again be targeted to occur between 6 and 24 hours after the second sample. It is important to note that precipitation duration is extremely difficult to predict so adaption of the sampling schedule during an event may be needed.

2.4.1 WET WEATHER SAMPLING PROTOCOL

Decisions to initiate and continue sampling for wet weather events are given below.

- LimnoTech will monitor the weather forecasts within the study area on a daily basis.
- Precipitation should cover the majority of the CSS area to be considered as a wet weather event. Spotty rain events in certain parts of the watershed will not be sampled.
- When precipitation of greater than 0.5 inch is forecasted with greater than 50% probability, and the CSS has not experienced measureable precipitation in the previous 72 hours, the LimnoTech Field Manager will notify the sampling team and laboratory to be put on alert. This alert will be considered "Go" status, unless otherwise notified. The sampling team will begin mobilizing equipment, bottles and personnel so that they can initiate sampling when precipitation begins.
- The sampling team will confer with the LimnoTech Field Manager to confirm timing for initiation of sampling and subsequent rounds of sampling. The LimnoTech Field Manager will notify the analytical laboratory when sampling has been initiated. The sampling team will coordinate with the analytical laboratory for transfer of samples.
- LimnoTech will continue to monitor the precipitation as the rain event progresses. If the storm conditions are significantly smaller than forecasted (either in rainfall depth or geographical extent), the sampling event may be aborted.
- If a wet weather event is aborted, LimnoTech may either direct the sampling team and analytical laboratory to complete one round of sampling and analysis for use as a routine event, or LimnoTech may direct the sampling team to discard samples and the laboratory to cancel analysis of samples received.

* * * * *

3.0 FIELD PROCEDURES AND METHODS

This section provides a description of the field methods, equipment, and sample handling procedures that will be used during the monitoring program. All field measurements, equipment cleaning, and sampling procedures will be conducted in accordance with standard procedures presented in this document.

3.1 SAMPLING EQUIPMENT

The sampling equipment required for the monitoring program includes, but is not limited to the items included in Table 3-1.

Table 3-1 Sampling Equipment List

Equipment	Equipment
Calibration materials/pH standards	Maps
Instrument calibration forms	SAP/QAPP/HASP
Coolers with ice	Field documentation forms/pens
Equipment cleaning materials	Sample labels
Field meter(s)	Chain-of-custody forms
Backup meter(s)	Emergency contact list
Sampling devices (e.g., s.s. bucket, dip pole, Kemmerer sampler)	Phone
Sample bottles	Flashlight
Sampling gloves/PPE	Additional equipment, as identified

3.2 EQUIPMENT CLEANING

Sampling protocols will be employed to provide consistency and reproducibility to the sampling methods used by field personnel. For all sampling related procedures, personnel will use personal protective equipment as required by the HASP.

3.3 FIELD DOCUMENTATION

Field documentation forms will serve as a daily record of events, measurements, observations, and samples collected during all field activities. Information pertinent to monitoring activities will be

recorded on the field documentation forms and stored sequentially in a field log book, preferably a three-ring binder. Entries on the field documentation forms will include:

- Date and time of sampling
- Names of field crew
- Weather conditions (e.g., air temperature, cloud cover, precipitation or snowmelt)
- Sampling location ID
- Location of measurements and sample collection
- Water quality meter identification number
- Field measurement results
- Sampling equipment used
- Number of samples collected
- Sample identification number
- Field observations and details related to analysis or integrity of samples (e.g., weather conditions, noticeable odors, colors, stream flow conditions, etc.)

An example of a field documentation form is provided in Appendix A. A copy of this form, or similar form, should be filled out each time sampling and/or field measurements are conducted at a sampling location. In the event of wet weather, field forms on waterproof paper and a "write in the rain" pen may be used to record field observations and field measurement data. Information recorded in a field book should be transferred to separate field documentation forms as soon as possible following the completion of a sampling round.

3.4 FIELD MEASUREMENTS

Field measurements of the water quality parameters listed in Table 3-2 will be taken at the sample collection point depth, where possible, at each sampling location using a water quality meter, as follows.

- For the Kansas River and Missouri River sampling locations, field measurements will be taken from mid-depth at three (3) stations across the river including, off the left bank, in the center channel and off the right bank, looking upstream.
- For all other stream sampling locations, field measurements will be taken at mid-depth in the center of the stream, if possible. Otherwise, measurements should be taken from the bank at a representative, well-mixed location as close to the center of the stream as possible.

- For the CSO sampling locations, field measurements will be taken in the flowing water in the structure, if possible. Otherwise, field measurements may be recorded from the collected water immediately after collection.

Calibration of water quality meters should be performed at the beginning of each monitoring day prior to initiating any measurements and checked again at the end of each day. Calibration results will be recorded on a meter calibration and maintenance log maintained in the field log book.

Table 3-2 Summary of Field Measurements

Parameter	Units	Location of Measurement	Method
Temperature	deg. Celsius	Mid-channel in streams or in flow of CSO, where possible, otherwise measure collected water Left, center and right channels at mid-depth for Kansas and Missouri River locations	Water quality meter (YSI, Hydrolab or similar other brand)
pH	std. units		
Dissolved Oxygen	mg/l		

Concurrent with field measurements, observations will be made at each monitoring location related to weather, aesthetic impacts and evidence of recreational use. These observations will be documented on a field documentation form. Table 3-3 summarizes the types of observations that should be recorded at each location. The field crew is encouraged to take pictures, log them on a field documentation form, and include them in the field log book with appropriate documentation (date, time, location and description of noteworthy items).

Table 3-3 Summary of Field Observations

Observation Type	Potential Descriptors
Floating Debris	Logs, woody debris, oil sheen, type of trash (e.g. sanitary products, beverage containers, etc.)
Submerged Debris	Tires, bottles, trash, etc. or not able to see bottom
Algal Growth	None, light, medium, heavy, submerged or emergent
Odor	Septic, etc.
Recreational Use	Primary (Swimming) or Secondary (wading, boating, canoeing, kayaking, fishing, etc.)

3.5 SAMPLE HANDLING AND CUSTODY

Samples for laboratory analysis will be collected at all sampling locations, as described below.

CSO locations:

- CSO samples may be collected using one of three methods:
  - By lowering a clean stainless steel bucket into the water and then pouring from the bucket to clean sample containers.
  - By dipping a clean container attached to a pole into the water, pouring the sample into a clean stainless steel bucket until enough sample volume has been collected, and then pouring from the bucket into the clean sample containers.
  - By collecting the sample directly into the sample containers. The direct method should be used with caution for the collection of samples where sample bottles already contain preservatives.

Stream locations:

- For the Kansas River and Missouri River sampling locations, samples will be collected from a boat at three (3) stations across the river including, off the left bank, in the center channel and off the right bank, looking upstream. The samples will be collected at mid-depth using a Kemmerer (or equivalent) sampler.
- For all other stream sampling locations, samples will be collected at mid-depth in the center of the stream, if possible. Otherwise, samples should be taken from the bank at a representative, well-mixed location as close to the center of the stream as possible. Samples may be collected using one of three methods:
  - By lowering a clean stainless steel bucket into the water and then pouring from the bucket to clean sample containers.
  - By dipping a clean container attached to a pole into the water, pouring the sample into a clean stainless steel bucket until enough sample volume has been collected, and then pouring from the bucket into the clean sample containers.
  - By collecting the sample directly into the sample containers. The direct method should be used with caution for the collection of samples where sample bottles already contain preservatives.

At all locations, care should be taken to avoid capturing bottom sediment or surface foam/scum during sample collection. All sampling equipment must be cleaned prior to sample collection. Sample containers will be provided by the laboratory.

A summary of the parameters, sample containers, sample volumes, storage requirements, sample holding times, and analytical methods is provided inTable 3-4.

Table 3-4 Water Quality Samples and Laboratory Analytical Methods

Parameter	Sample Container	Sample Volume	Sample Preservation	Sample Holding Time	Analytical Method	Detection Limit
E. coli	Sterilized, Plastic or Glass	500 ml	0.008% $Na_2S_2O_3$, Refrigerate <10°C	6 hours desired, 24 hours accepted	SM9223 B	10 cfu/100 mL
Total Suspended Solids	Plastic or Glass	100 ml	Refrigerate to ≤6°C	7 days	SM 2540 D	1 mg/L
Total Metals – Cd, Cr, Cu, Ni, Pb, Zn, Ag	Plastic or Glass	1 L	HNO_3 to pH<2, Hold 18 hours, Refrigerate to ≤6°C	6 months	EPA 200.7/ 6010B/ 7470/ 7471	5 ug/L
Total Hardness	Plastic or Glass	500 ml	HNO_3 to pH<2, Refrigerate to ≤6°C	6 months	SM 2340 C	2 mg/L

3.6 SAMPLE LABELING

All samples will be assigned a unique identification code such that all necessary information can be attained from the sample label, as shown below:

Sample ID: __ __ - __ __ - __ - __ __ __ __ __ __ - __ __ __ __

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Characters 1-4:	Sample site ID (see Table 2-1)
Character 5:	Channel Location
	(when facing upstream: Left = L, Center = C, Right = R)
Characters 6-11:	Date (e.g. September 23, 2013 = 092313)
Characters 12-15:	Time using 24-hour clock

Routine Sample ID Example:

MR-02-C-052313-1400	Denotes a water quality monitoring sample collected from the center channel of the Missouri River location 02 on May 23, 2013 at 2:00 p.m.

Field quality control sample (e.g., field duplicate and field blank) identification is slightly different from the routine samples. The blank and duplicate identification will be in the same form as other samples except for the following changes:

- Field duplicate samples - DUP will be added to the end of the standard sample ID.
- Field blank samples - FRB will be added to the end of the standard sample ID.

Quality Control Sample ID Examples:

MR-02-C-052313-1400-DUP	Denotes a field duplicate sample associated with the routine sample example, above.
MR-02-C-052313-1415-FRB	Denotes a field blank sample generated at the MR-02 location after the routine sample was collected.

3.7 SAMPLE DELIVERY

Sample handling and delivery procedures are designed to ensure that the samples and the chain-of-custody forms will arrive at the laboratory intact and together. Samples will either be picked up by a courier from the laboratory or delivered to the laboratory by the sampling crew, as described below.

- All samples collected will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. Use indelible waterproof marking pen and include:
  - Sample identification code
  - Analysis required;
  - Date sampled;
  - Time sampled;
  - Crew identification;
  - Preservation added, if applicable.

- Check the caps on the sample containers so that they are tightly sealed.

- Cover the sample container label and cap with clear packing tape to secure the label and cap onto the container, if necessary.

3.8 CHAIN-OF-CUSTODY FORMS

Completed chain-of-custody forms will be required for all samples to be analyzed. Chain-of-custody (COC) forms will be initiated by the sampling crews in the field during the sampling events. The chain-of-custody form will contain for each sample, a unique identification number, sample date and time, sample description, sample type, sample preservation, and analyses required. The samples and signed chain-of-custody form will remain in the possession of the sampling crew until the samples are relinquished to the control of others (i.e., laboratory staff or delivery personnel). A copy will be retained for field documentation.

3.9 DATA SUBMITTAL

All generated documentation and data (field notes, field forms, instrument calibration sheets, field data, photos, COCs) will be reviewed for accuracy and completeness by the field crews and sent to the LimnoTech Field Manager after each monitoring event. Following review by the Field Manager these items will be included in the project files.

* * * * *

4.0 QUALITY CONTROL

The monitoring data that will be collected is intended to meet the quality assurance objectives presented in the Quality Assurance Project Plan (QAPP). Data quality will be measured in terms of accuracy, precision, completeness, representativeness, comparability, and the required detection limits for the analytical methods. Each of these data quality indicators is defined in the QAPP. Quality Control samples will be collected in the field to support the assessment of data quality. This section describes the type and frequency of Quality Control samples.

4.1 FIELD BLANKS

Field accuracy will be assessed through the use of field (or equipment) blanks. Field blanks are used to evaluate the potential for sample contamination resulting from sampling equipment, supplies or activities. In order for the accuracy assessment to be relevant, all appropriate protocols concerning sample collection, handling, preservation, and hold times must be maintained. Field blanks should be collected after the sampling equipment has been cleaned in accordance with appropriate specified cleaning procedures. Field blanks will consist of a reagent grade deionized water rinse of sampling equipment that is collected into separate sample containers. The field blank results should exhibit levels below detection for all parameters.

Field blanks will be collected at a frequency of 5% or a minimum of one blank during each sampling event.

4.2 FIELD DUPLICATES

Duplicate or replicate samples will be taken for a portion of the samples to assess field precision. Precision is a measure of the agreement between two or more measurements. A field duplicate is defined as a sample produced when a single sample is split into two or more aliquots immediately after the sample is collected. Each aliquot is placed into a separate container and analyzed separately. The laboratory analysis should result in comparable results for the original sample and the duplicate for the site.

Field duplicates will be collected at a frequency of 10%.

* * * * *

5.0 PROGRAM SAFETY

Sampling conditions will vary greatly and are often complicated by wet weather and darkness. The element of danger is accentuated if personnel are unfamiliar with their surroundings and/or procedures. Consequently, staff must be properly trained in both safety and monitoring procedures. Sampling and analysis efforts will be conducted in accordance with a Health and Safety Plan (HASP). The HASP will include information on responsibilities, safe work practices, hazards and controls, and emergency procedures. Any UG contractors must operate under their own HASP.

With stream and CSO monitoring, common sense is essential. Hazards that field staff may face during wet weather include high stream conditions and slippery footing. With surfaces being wet and slippery, special care must be taken when boating, walking and working around bridges and stream banks. Where sampling from steep stream banks and stream conditions are high and fast, land-based field staff should wear a safety belt or harness and be appropriately tethered. Additionally, under these conditions, field staff must wear an approved floatation device. Boat-based field staff must be experienced in boating operations and be on the look-out for and avoid other river traffic and floating, submerged and overhead obstructions. Boat-based staff must always wear an approved floatation device.

5.1 GENERAL SAFETY PRACTICES

- Field crews should inform others of sampling schedules and expected itineraries.
- Sampling should not be carried out in weather that is considered by the field crew member to be hazardous to the well-being of the field staff and/or equipment.
- Field staff are required to wear approved floatation devices and be tethered if conditions warrant.
- First aid kits will be issued to all field crews.
- Each field crew will have a cellular phone and will have been instructed on emergency procedures and phone numbers.
- Each field crew will have appropriate lights, markers, etc. to be able to perform their work safely under poor visibility/nightfall.
- Each field crew will have the appropriate road safety equipment as required.

5.2 HEALTH HAZARDS

Disease causing bacteria, viruses, and parasites are often present in sewers and receiving streams. Therefore, proper hygiene methods must be followed. Wash hands before eating or smoking. Personal

protective equipment must be used as specified in the HASP, specifically the use of latex gloves when collecting samples. Workers should avoid touching their eyes to prevent an inflammation. Cuts and abrasions of the skin should be covered by bandages or gloves to minimize the chance of infection by organisms.

* * * * *

APPENDIX A

Field Documentation

APPENDIX A - FIELD DOCUMENTATION

Field Documentation Form: Water Quality Monitoring Program		
Field crew:	**Date:**	**Time:**
Monitoring site: **Sampling location:**	**Current weather condition:** **Precipitation or snowmelt:**	

Field Measurements (meter ID:)

Air Temperature (F or C)	Water Temperature (F or C)	pH	Dissolved Oxygen (mg/L)

Sample ID (XX-XX-X-MMDDYY-HHMM):

Sample Collection	**Yes**	**No**
Esherichia coliform (*E.* coli)		
Total Suspended Solids (TSS)		
Total Metals		
Hardness		
Others:		

QA/QC Samples	**Yes**	**No**	**Sample ID (XX-XX-X-MMDDYY-HHMM -DUP/FRB)**
Field Blank			
Field Duplicate			

Field Observations

Observation Type	**Description**
Floating or submerged debris?	
Algal growth?	
Odor?	
Recreational use?	
Other comments	

CONTACT INFORMATION

Name	Organization	Office Phone	Cell Phone
TBD	UG	TBD	TBD
TBD	UG Program Management	TBD	TBD
Hans Holmberg	LimnoTech Project Manager	715-808-0182	651-269-4526
Bob Betz	LimnoTech Field Manager	734-332-1200	734-834-8817
TBD	Sampling Contractor Project Manager	TBD	TBD
TBD	Sampling Contractor Sampling Team	TBD	TBD
TBD	Sampling Contractor Sampling Team	TBD	TBD
TBD	Analytical Laboratory Project Manager	TBD	TBD
TBD	Analytical Laboratory Sampling Coordinator	TBD	TBD