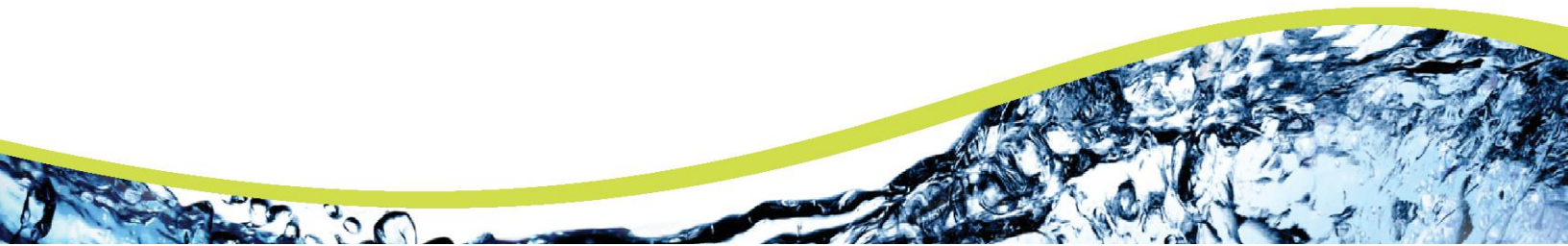
Clean Water 2020 Program

WWTP OPERATIONS PROGRAM

Updated December 2015

We Are Columbia



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Program Summary and Intent

This updated WWTP Operations Program is a component of the following requirement of the Consent Decree:

- **Paragraph 11.b "<u>WWTP Operations Program.</u>** Columbia currently has a WWTP Operations Program in place. Within eighteen (18) months after the Date of Entry of this Consent Decree, Columbia shall submit to EPA and DHEC for review, comment, and approval an updated WWTP Operations Program. The goal of the updated WWTP Operations Program is to ensure that all Equipment is operated to achieve compliance with the NPDES Permit."

This update addresses the following specific requirements of the Consent Decree.

- Subparagraph 11.b.(i) "The updated WWTP Operations Program shall include an Operations Plan."
- Subparagraph 11.b.(ii) **"**The updated WWTP Operations Program shall include a Process Control Plan."
- Subparagraph 11.b.(iii) **"**The updated WWTP Operations Program shall include a Compliance Monitoring Plan."

Operations Plan

The Operations Plan Section of the WWTP Operations Program addresses the following specific requirements of the Consent Decree.

- Subparagraph 11.b.(i)(A) "the operations manuals for all Equipment."
- Subparagraph 11.b.(i)(B) "descriptions of the operational controls at the WWTP."
- Subparagraph 11.b.(i)(C) "the maximum flow that each process unit may treat before effluent quality is expected to exceed NPDES Permit limits."
- Subparagraph 11.b.(i)(D) "a peak flow operations plan."
- Subparagraph 11.b.(i)(E) "schematics of the solids and liquids treatment processes."
- Subparagraph 11.b.(i)(F) "a procedure for review and update on an annual basis of an organizational chart consisting of the names, positions, and telephone numbers of the operations personnel at the WWTP."
- Subparagraph 11.b.(i)(G) "detailed procedures for the year-round disposal of biosolids which include alternative disposal methods should the primary disposal method not be employable."
- Subparagraph 11.b.(i)(H) "a detailed operations training program for WWTP operations personnel and supervisors."

- Subparagraph 11.b.(i)(I) "detailed procedures for adding operating information for new Equipment into the WWTP Operations Program prior to the date on which Columbia commences operation of that Equipment."

Process Control Plan

The Process Control Plan Section of the WWTP Operations Program addresses the following specific requirements of the Consent Decree.

- Subparagraph 11.b.(ii)(A) "Parameters for each treatment unit that is monitored for the purpose of process control, including the appropriate frequency of monitoring and guidelines for interpreting the data in order to implement modification(s) and adjustment(s) to the systems and Equipment."
- Subparagraph 11.b.(ii)(B) "Tasks associated with the operation of the WWTP, including overall process control strategy and unit-specific tasks, an analysis of the level of personnel assigned to the task and the frequency and duration associated with the tasks."
- Subparagraph 11.b.(ii)(C) "Procedures for unit-specific tasks and overall process control (hereafter referred to as "Standard Operating Procedures")."
- Subparagraph 11.b.(ii)(D) "Standard Operating Procedures (including emergency response plans, as necessary) for abnormal operational conditions (e.g., power outages and weather-related events) to ensure that Equipment is operated to achieve compliance with the NPDES Permit, ensure safety of all personnel, and ensure proper communication among WWTP personnel of the current operational state of the WWTP (hereafter referred to as "Contingency Operating Procedures")."

Compliance Monitoring Plan

The Compliance Monitoring Plan Section of the WWTP Operations Program addresses the following specific requirements of the Consent Decree.

- Subparagraph 11.b.(iii)(A) "procedures for proper calibration of compliance monitoring equipment which also identifies the frequencies required by the manufacturer and Columbia."
- Subparagraph 11.b.(iii)(B) "procedures to ensure that representative compliance sampling is conducted at the WWTP in accordance with the requirements of NPDES permits and 40 C.F.R. Part 136."
- Subparagraph 11.b.(iii)(C) "descriptions of all compliance sampling locations."
- Subparagraph 11.b.(iii)(D) "schematics showing the compliance sampling locations."

- Subparagraph 11.b.(iii)(E) "procedures for collecting compliance samples from the designated locations."
- Subparagraph 11.b.(iii)(F) "procedures for obtaining compliance sample containers, preservatives, and/or monitoring equipment from the laboratory."
- Subparagraph 11.b.(iii)(G) "procedures for collecting compliance samples in containers as described in 40 C.F.R. Part 136."
- Subparagraph 11.b.(iii)(H) "procedures to ensure that all compliance samples requiring immediate (e.g., within fifteen (15) minutes) analyses are either monitored in the field or transported to the laboratory within proper holding times for analysis."

WWTP Operations Program Goal

The goal of the WWTP Operations Program is to ensure that all Equipment, as identified by the Consent Decree (CD), is operated to achieve compliance with the NPDES Permit. The WWTP Operations Program includes an Operations Plan, a Process Control Plan, and Compliance Monitoring Plan. This program addresses the specific requirements of the CD as outlined in **Table 1** and was developed based on the specific needs of the City's WWTP.

This Operations Program has been prepared in accordance with the requirements of Paragraph 11 of the Consent Decree entered by order dated May 21, 2014 in *The United States of America and State of South Carolina by and through the Department of Health and Environmental Control (SCDHEC) vs. the City of Columbia*, Civil Action No. 3:13-2429-TWL, DOJ Case Number 90-5-1-1-00954. The updated Operations Program addresses the specific requirements of the Consent Decree (CD) as outlined in **Table 1** and was developed based on the specific needs of the City's WWTP.

For purposes of the updated WWTP Operations Program, certain WWTP equipment is defined as follows:

"Equipment" is defined in Section 11.a.(i) of the CD as "equipment integral to proper operation and maintenance, treatment units, and tanks used in the treatment of wastewater liquids and biosolids." Equipment does not include ancillary items, such as sump pumps or HVAC equipment.

Table 1 – CD Compliance Requirements for WWTP Operations Program

CD Section	CD Requirement	Operations Program Section
11.b.(i)	"The updated WWTP Operations Program shall include an Operations plan."	Section 1. Operations Plan
11.b.(ii)	"The updated WWTP Operations Program shall include a Process Control Plan."	Section 2. Process Control Plan
11.b.(iii)	"The updated WWTP Operations Program shall include a Compliance Monitoring Plan."	Section 3. Compliance Monitoring Plan

CD Section	CD Requirement	Operations Program Section
11.b.(iv)	"An implementation schedule specifying dates and actions."	Section 4. WWTP Operations Program Implementation Plan

Acronyms & Abbreviations

BOD – Biochemical Oxygen Demand

CD – Consent Decree

City – City of Columbia

CMMS – Computerized Maintenance Management System

COP – Contingency Operating Procedure

CW2020 – City's program to manage consent decree compliance

DUE – Department of Utilities and Engineering

EPA – United States Environmental Protection Agency

NPDES – National Pollution Discharge Elimination System

MGD – Million Gallons per Day

RFP – Request for Proposal

SCDHEC – South Carolina Department of Health and Environmental Control

SOP – Standard Operating Procedure

SSO – Sanitary Sewer Overflow

WWTP – Wastewater Treatment Plant

Section 1 Operations Plan

The Operations Plan of the WWTP Operations Program addresses the specific requirements of the Consent Decree as outlined in **Table 2** and was developed based on the specific needs of the City's WWTP.

Table 2 – CD Compliance Requirements for the WWTP Operations Program

CD Section	CD Requirement	Operations Program Section
11.b.(i)	"The updated WWTP Operations Program shall include an Operations plan. At minimum, the Operations Plan shall include:"	Section 1. Operations Plan
11.b.(i)(A)	"The operations manual for all Equipment;"	Section 1.1 Operations Manuals
11.b.(i)(B)	"Descriptions of the operational controls at the WWTP;"	Section 1.2 Operational Controls
11.b.(i)(C)	"The maximum flow that each process unit may treat before effluent quality is expected to exceed NPDES Permit limits;"	Section 1.3 Process Unit Maximum Flows
11.b.(i)(D)	"A peak flow operations plan;"	Section 1.4 Peak Operations Flow Plan and Schematic
11.b.(i)(E)	"Schematics of the solids and liquids treatment processes;"	Section 1.4 Peak Operations Flow Plan and Schematic
11.b.(i)(F)	"A procedure for review and update on an annual basis of an organizational chart consisting of the names, positions, and telephone numbers of the operations personnel at the WWTP;"	Section 1.5 Organization Chart Review and Updates
11.b.(i)(G)	"Detailed procedures for the year-round disposal of biosolids which include alternative disposal methods should the primary disposal method not be employable;"	Section 1.6 Biosolids Disposal Procedures
11.b.(i)(H)	"A detailed operations training program for WWRP operations personnel and supervisors; and"	Section 1.7 Operations Training Program
11.b.(i)(I)	"Detailed procedures for adding operating information for new Equipment into the WWTP Operations Program prior to the date on which Columbia commences operation of that Equipment."	Section 1.8 Operations Procedures for New Equipment Additions

1.1 Operations Manuals

The Metropolitan (Metro) Wastewater Treatment Plant Operations Manual, hereafter referred to as the *Metro Operations Manual (a.k.a. Green Book),* is included in the Operations Plan. In addition, a comprehensive set of Standard Operating Procedures (SOPs) is provided to guide staff in effectively operating WWTP operations, processes and Equipment. The *Metro Operations Manual* is currently

maintained and accessible electronically to all operators. The *Metro Operations Manual* is a fluid, dynamic document that is routinely reviewed and revised as necessary. Each unit process in the *Metro Operations Manual* includes a Troubleshooting section which provides guidance to the operations staff on properly addressing unusual or abnormal situations.

1.2 Operational Controls

A description of the operational controls at the WWTP is contained in the *Metro Operations Manual*. (A detailed index of topics covered in the *Metro Operations Manual* is provided in **Appendix B**). Additional information on plant controls is provided in the following SOPs:

1. Influent Pump Station SOPs
2. Preliminary Treatment Facilities SOPs
3. Train 1 Primary and Secondary Treatment SOPs
4. Train 2 Primary and Secondary Treatment SOPs
5. Disinfection SOPs
6. Solids Handling SOPs

These SOPs are fluid, dynamic documents that are routinely reviewed and revised as necessary. The operational controls and SOPs are addressed in **Sections: 2.1 Process Control Parameters, 2.2 Process Control Strategy, and 2.3 Process Control Standard Operating Procedures**.

1.3 Process Unit Maximum Flows

The WWTP has two treatment trains (Train 1 and Train 2) providing primary and secondary treatment along with disinfection. The present maximum flow design capabilities of Train 1 are 60 million-gallons-per-day (MGD), and the maximum flow design capabilities of Train 2 are 30 MGD. However, while the design flow (with designed assumptions), specific to the treatment process units at the WWTP, are located in the *Metro Operations Manual*, identification of a specific maximum flow that will maintain compliance with the effluent limitations identified in the NPDES permit varies, and cannot be specified as a numeric maximum without considering how the varying real time wastewater characteristics influence the specific process unit.

Train 1 is designed for a maximum capacity of 60 MGD based on design raw water characteristics of 200 mg/L Biochemical Oxygen Demand (BOD) and 225 mg/L suspended solids. Train 2 is designed for a maximum capacity of 30 MGD based on design raw water characteristics of 376 mg/L BOD and 346 mg/L suspended solids. Permitted effluent characteristics are a monthly and weekly BOD average of 30 mg/L and 45 mg/L, respectively, and a monthly and weekly suspended solids average of 30 mg/L and 45 mg/L, respectively. Other permitted characteristics are noted in the *Metro Operations Manual*.

While these are design values, definite operating values must be determined by the specific conditions of loading and flow present at any time. These values can be higher or lower depending on the wastewater

characteristics, hydraulic conditions, temperature and other such factors. There are many qualifications that must be considered when determining flow capabilities.

Based on the raw wastewater characteristics above, unit processes in the plant should have the following maximum flow capacities:

Preliminary Treatment Facilities (common to both treatment trains) – The Screening process has a maximum capacity of 150 MGD, and the Grit Removal process has a maximum capacity of 210 MGD.

TRAIN 1

Primary Settling Tanks – The Primary Settling Tanks have a design flow of 40 MGD at a surface overflow rate of 1,042 gpd/sf and detention time of 1.8 hours. At a peak design flow rate of 100 MGD the surface overflow rate is 2,606 gpd/sf and the detention time is 0.72 hours (43 minutes).

Aeration Tanks (Basins) – The Aeration Tanks have an average design flow rate of 40 MGD with a detention time of 4.0 hours (based on forward flow only).

Final Clarifiers – The Final Clarifiers have a maximum design flow of 60 MGD at a surface overflow rate of 815 gpd/sf.

Chlorine Contact Tanks – The Chlorine Contact Tanks, used for disinfection, have a design flow of 40 MGD with a detention time through the basins of 30 minutes. At the peak design flow rate of 100 MGD the detention time through the basins is 12 minutes.

TRAIN 2

Primary Settling Tanks – The Primary Settling Tanks have a design flow of 20 MGD at a surface overflow of 1,042 gpd/sf and detention time of 1.8 hours. At the peak design flow rate of 50 MGD the surface overflow rate is 2,606 gpd/sf and the detention time is 0.72 hours (43 minutes).

Aeration Tanks (Basins) – The Aeration Tanks are designed for an organic loading of 50.5 lbs. BOD5/1,000 ft3/day and a detention time of approximately 7.2 hours at the average design flow of 20 MGD.

Final Clarifiers – The Final Clarifiers are designed for an average flow of 20 MGD with a surface overflow rate of 408 gpd/sf. At the peak flow rate of 40 MGD the surface overflow rate is 816 gpd/sf.

Chlorine Contact Tanks – The Chlorine Contact Tanks, used for disinfection, have an average design flow of 20 MGD with a detention time of 31 minutes. At the peak flow of 50 MGD the detention time through the basins is 12 minutes.

Dechlorination Basin – The Dechlorination Basin is designed to handle the flow from both treatment trains.

1.4 Peak Flow Operations Plan and Schematic

Peak flow operations procedures for the WWTP are contained in the "*Contingency Operating Procedures (COPs),*" which are in the Process Control Plan, and described in **Section 2.4**.

These COPs are fluid, dynamic documents that are routinely reviewed and revised as necessary. Updated versions of the *COP*s are maintained and accessible electronically to all operators.

The process schematic of the facility shows current liquid and solids treatment capacities and configuration and is available in the *Metro Operations Manual*. A copy of the schematic is contained in **Appendix A**.

1.5 Organization Chart Review and Updates

WWTP personnel update the WWTP organization chart at least annually in accordance with the Metro WWTP Organizational Chart SOP.

1.6 Biosolids Disposal Procedures

Biosolids disposal is currently contracted through an outside vendor. The vendor's current primary disposal site for the biosolids is at the Richland County Landfill located on Highway Church Road, Elgin, SC. Should this site become unavailable for disposal, the City's current contract with the vendor identifies two other landfill disposal sites within a 100-mile radius that can be utilized for disposal of the City's biosolids. Currently, the City's standard Requests for Proposals (RFPs) for biosolids disposal have language that requires vendors to provide information for alternate disposal locations.

1.7 Operations Training Program

A detailed Operations Training Program is under development. The City has developed a *Wastewater Operator Apprenticeship Training Program*, which provides a method to prepare newly hired operators for required certification examinations, as required by SCDHEC and the City. The program is administered through the California State University, Sacramento Office of Water Programs wastewater operator program. The City's Wastewater Operator Apprenticeship Training Program is registered with the U.S. Department of Labor, which requires that the apprenticeship program meet national standards. All staff in Wastewater Plant Operator positions at the WWTP must participate in this program. The program provides a path for advancement to all of the operators and is intended to solidify the knowledge and skill set necessary to be considered subject matter experts. Both the Operations Training Program and the *Wastewater Operator Apprenticeship Training Program* will be included in the WWTP Training Plan, as required by the Consent Decree Section 11.c, which will be submitted to EPA in accordance with the Consent Decree.

1.8 Operations Procedures for New Equipment Additions

An SOP has been developed detailing procedures for adding operating information for new Equipment into the WWTP Operations Program prior to the date on which Columbia commences operation of that Equipment. This SOP includes steps for modifying the associated SOPs, plant schematics and *Metro Operations Manual*. SOPs are fluid, dynamic documents that are routinely reviewed and revised as necessary. Updated versions of the SOPs are maintained and accessible electronically to all operators.

Section 2 Process Control Plan

The Process Control Plan of the WWTP Operations Program addresses the following specific requirements of the Consent Decree outlined in **Table 3**:

Table 3 – CD Compliance Requirements for the Process Control Plan

CD Section	CD Requirement	Operations Program Section
11.b.(ii)	"The updated WWTP Operations Program shall include a Process Control plan. At minimum, the Process Control Plan shall include:"	Section 2. Process Control Plan
11.b.(ii)(A)	"Parameters for each treatment unit that is monitored for the purpose of process control, including the appropriate frequency of monitoring and guidelines for interpreting the data in order to implement modification(s) and adjustment(s) to the systems and Equipment;"	Section 2.1 Operations Manuals
11.b.(ii)(B)	"Tasks associated with the operation of the WWTP, including overall process control strategy and unit-specific tasks, an analysis of the level of personnel assigned to the task and the frequency and duration associated with the tasks;"	Section 2.2 Process Control Strategy
11.b.(ii)(C)	"Procedures for unit-specific tasks and overall process control (hereafter referred to as "Standard Operating Procedures");"	Section 2.3 Process Control Standard Operating Procedures
11.b.(ii)(D)	"Standard Operating Procedures (including emergency response plans, as necessary) for abnormal operational conditions (e.g., power outages and weather-related events) to ensure that Equipment is operated to achieve compliance with the NPDES Permit, ensure safety of all personnel, and ensure proper communication among WWTP personnel of the current operational state of the WWTP (hereafter referred to as "Contingency Operating Procedures")."	Section 2.4 Contingency Operating Procedures

2.1 Process Control Parameters

Parameters for each treatment unit that are monitored for the purpose of process control include the appropriate frequency of monitoring and guidelines for interpreting the data in order to implement modifications and adjustments to the systems and Equipment. These parameters are contained in the four Process Control SOPs listed below.

1. Train 1 Primary and Secondary Treatment SOPs
2. Train 2 Primary and Secondary Treatment SOPs
3. Disinfection SOPs
4. Solids Handling SOPs

Information contained in the SOPs is as follows:

- Process-related tasks
- Parameters that are monitored (e.g., flow, pH, total suspended solids, etc.)
- Frequency of testing (for tests that are not from continuous analyzers) including:
    - Minimum frequency
    - Normal frequency
    - Alert level frequency
- Expected range of normal values for each parameter
- Alert levels for each parameter
- Actions to take when levels are in alert

These SOPs are fluid, dynamic documents that are routinely reviewed and revised as necessary. These process control SOPs are maintained and accessible electronically to staff and are in addition to the *Metro Operations Manual*, where overall wastewater process understanding is addressed.

While there are operational control SOPs for influent pumping and preliminary treatment (e.g., bar screens and grit removal chambers) these SOPs do not address process control since there are no specific process control parameters associated with these systems. SOPs for these processes are addressed in **Section 1.2**.

2.2 Process Control Strategy

The process control strategy includes unit-specific tasks associated with the operation, which are contained in the Process Control SOPs as noted in **Section 2.1**, Process Control Parameters. For unit-specific tasks, the Computerized Maintenance Management System (CMMS) system will be used to issue work orders in accordance with the *Maintenance Management System* previously submitted to EPA. The work orders contain information on expected duration and frequency, and the level of personnel assigned to the task.

2.3 Process Control Standard Operating Procedures

The Process Control SOPs include unit-specific tasks associated with the process operation, which are contained in the Process Control SOPs as noted in **Section 2.1**. Some information is included in the *Metro Operations Manual,* such as start-up and shut-down of individual process units. These SOPs are fluid, dynamic documents that are routinely reviewed and revised as necessary.

2.4 Contingency Operating Procedures

The procedures needed to respond to abnormal operational conditions are currently covered in five Contingency Operating Procedures (COPs). The COPs are maintained and accessible electronically to all operators. These COPs are fluid, dynamic documents that are routinely reviewed and revised as necessary.

The COPs employed by the WWTP at this time are as follows:

1. Peak Flow Operations
2. Loss of Power
3. Cold Weather
4. High River Level
5. Loss of Chemical Feed
6. Loss of Automatic Composite Sampler(s)

Section 3 Compliance Monitoring Plan

The Compliance Monitoring Plan of the WWTP Operations Program addresses the specific requirements of the Consent Decree as outlined in **Table 4** and was developed based on the specific needs of the City's WWTP.

Table 4 – CD Compliance Requirements for the Compliance Monitoring Plan

CD Section	CD Requirement	Operations Program Section
11.b.(iii)	"The updated WWTP Operations Program shall include a Compliance Monitoring Plan. At minimum, the Compliance Monitoring Plan shall include:"	Section 3. Compliance Monitoring Plan
11.b.(iii)(A)	"Procedures for proper calibration of compliance monitoring equipment which also identifies the frequencies required by the manufacturer and Columbia;"	Section 3.1 Calibration of Compliance Monitoring Equipment and Frequencies
11.b.(iii)(B)	"Procedures to ensure that representative compliance sampling is conducted at the WWTP in accordance with the requirements of NPDES permits and 40 C.F.R. Part 136;"	Section 3.2 Compliance Sampling Procedures
11.b.(iii)(C)	"Descriptions of all compliance sampling locations;"	Section 3.3 Compliance Sampling Locations and Procedures
11.b.(iii)(D)	"Schematics showing all compliance sampling locations;"	Section 3.3 Compliance Sampling Locations and Procedures
11.b.(iii)(E)	"Procedures for collecting compliance samples from the designated locations;"	Section 3.2 &3.3 Compliance Sampling Locations and Procedures
11.b.(iii)(F)	"Procedures for obtaining compliance sample containers, preservatives, and/or monitoring equipment from the laboratory;"	Section 3.4 Compliance Sampling Containers
11.b.(iii)(G)	"Procedures for collecting compliance samples in containers as described in 40 C.F.R. Part 136; and"	Section 3.4 Compliance Sampling Containers
11.b.(iii)(H)	"Procedures to ensure that all compliance samples requiring immediate (e.g., within fifteen (15) minutes) analyses are either monitored in the field or transported to the laboratory within proper holding times for analysis."	Section 3.5 Sample Holding Time Compliance

3.1 Calibration of Compliance Monitoring Equipment and Frequencies

All compliance monitoring analyses are currently performed by a contract laboratory certified by SCDHEC. As part of the contract laboratory's certification, SCDHEC requires proper calibration of the laboratory's compliance monitoring equipment.

Compliance monitoring equipment (i.e. flow meters and composite samplers) currently controlled by WWTP personnel, along with the equipment calibration and/or verification frequencies, are contained in the *Grab and Composite Sampling* SOP for composite samplers and the *Performing Preventive Maintenance on Plant Equipment* SOP, which are maintained and accessible electronically to all WWTP personnel.

3.2 Compliance Sampling Procedures

All compliance monitoring analyses are currently performed by a contract laboratory certified by SCDHEC. The contracted laboratory maintains and uses approved procedures for all analyses performed on behalf of the City.

3.2.1 Grab Compliance Samples

Representative grab compliance samples (pH, DO, TRC, Fecal Coliform, and low-level Hg), currently collected by a contract laboratory certified by SCDHEC. Samples are collected in accordance with the requirements of NPDES permits, Title 40 of the Code of Regulations, Part 136 (40 C.F.R Part 136) and under the direct supervision of WWTP staff in accordance with the *Contract Laboratory Monitoring* SOP. This SOP has been developed to ensure that representative grab samples are collected in accordance and the requirements of NPDES permits and 40 C.F.R Part 136.

3.2.2 Composite Compliance Samples

Representative composite compliance samples, currently collected by WWTP staff, are done so in accordance with the *Grab and Composite Sampling* SOP, requirements of NPDES permits and 40 C.F.R Part 136. These representative composite compliance samples are then relinquished by WWTP staff to the current contract laboratory in accordance with the *Contract Laboratory Monitoring* SOP.

3.3 Compliance Sampling Locations

All compliance monitoring analyses are currently performed by a contract laboratory certified by SCDHEC. Descriptions of all compliance sampling locations, along with a schematic showing those locations, are found in the *Grab and Composite Sampling* SOP. A schematic showing all compliance sampling locations is attached as **Appendix C**.

3.4 Compliance Sampling Containers

All compliance monitoring is currently performed by a contract laboratory certified by SCDHEC. As part of the contract laboratory's certification, SCDHEC requires the use of proper sampling containers for both grab and composite samples. All grab and composite sample containers are supplied by the current

contract laboratory. The contracted laboratory maintains and uses approved sampling containers for all compliance sampling conducted on behalf of the City.

3.4.1 Grab Compliance Sample Containers

Representative grab compliance samples (pH, DO, TRC, Fecal Coliform, and low-level Hg), currently collected by a contract laboratory certified by SCDHEC, are collected in properly preserved containers currently provided by the contract laboratory. These sample containers have been selected by the current contract laboratory in accordance with the requirements of NPDES permits and 40 C.F.R Part 136 Table 2.

3.4.2 Composite Compliance Sample Containers

Representative composite compliance samples are currently collected by WWTP staff in properly preserved containers provided by the current contract laboratory. These samples are collected in accordance with the *Grab and Composite Sampling* SOP, the *Contract Laboratory Monitoring* SOP, requirements of NPDES permits and 40 C.F.R Part 136 Table 2.

3.5 Sample Holding Time Compliance

All compliance monitoring is currently performed by a contract laboratory certified by SCDHEC. As part of the contract laboratory's certification, SCDHEC requires that all compliance samples requiring immediate (e.g., within fifteen minutes) analyses are either monitored in the field or transported to the laboratory. The contracted laboratory maintains and uses approved procedures for all analyses performed.

Procedures for ensuring that all compliance samples requiring immediate (e.g., within fifteen minutes) analyses are either monitored in the field or transported to the laboratory are found in the third party contract between the City and its current contract laboratory. This contract requires that all representative compliance samples are handled in accordance with the requirements of NPDES permits and 40 C.F.R Part 136 Table 2.

Section 4 Implementation Schedule

This section describes the City's WWTP Operations Program Implementation Schedule as described in Subparagraph 11.b.(iv) of the CD.

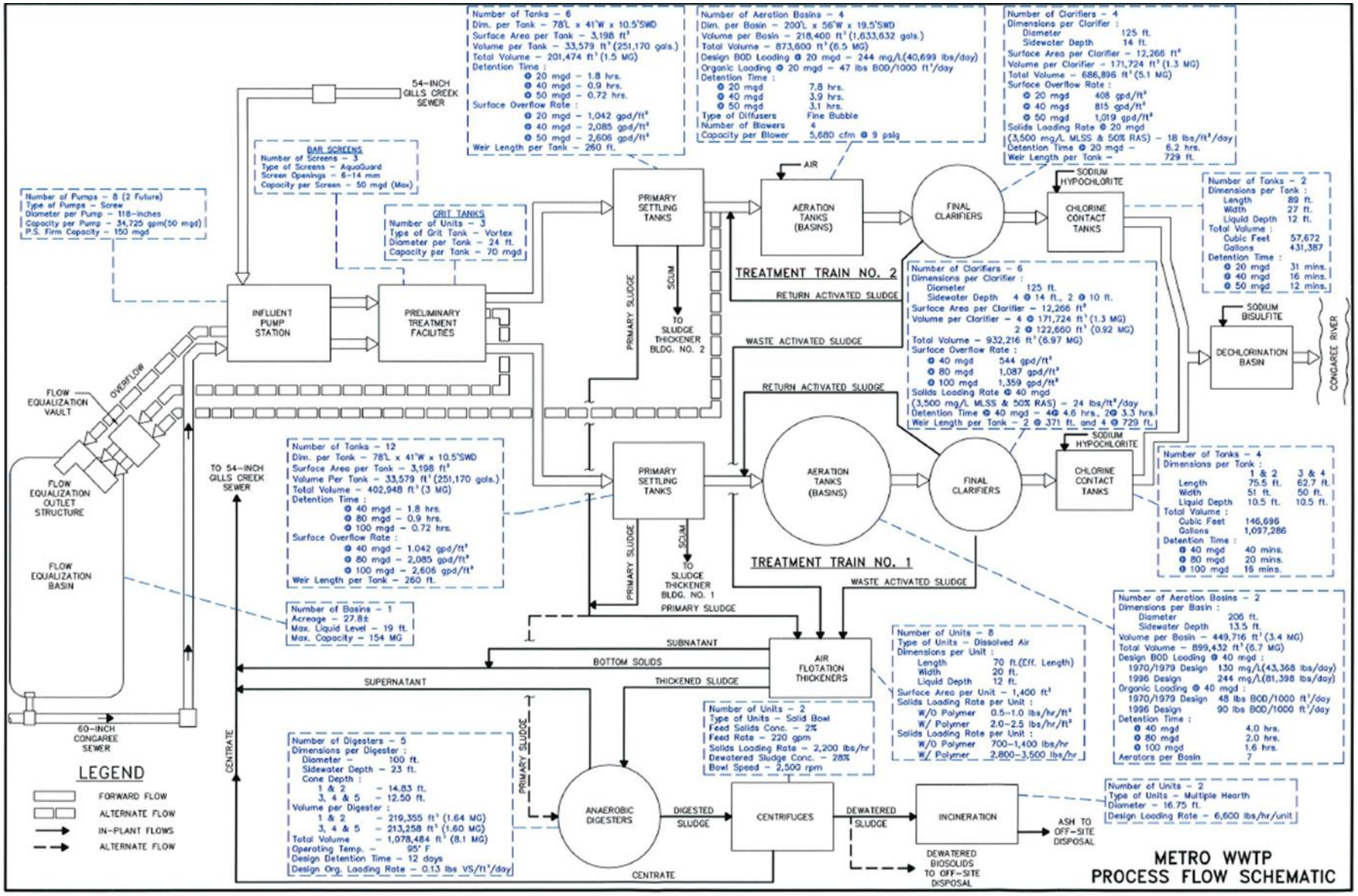
- Subparagraph 11.b.(iv) – An implementation schedule specifying dates and actions.

The following section provides a schedule outlined in **Table 5**, for the WWTP Operations Program described in this document.

Table 5 – WWTP Operations Program Implementation Schedule

WWTP Ops Program Section	CD Section	CD Requirement	Implementation Schedule
1.2	11.b.(i)(B)	"Written procedures describing the various operational controls at the WWTP."	Implemented 18 months from EPA approval of WWTP Operations Program

Appendix A: Metro WWTP Process Flow Schematic



Appendix B: Metro Operations Manual

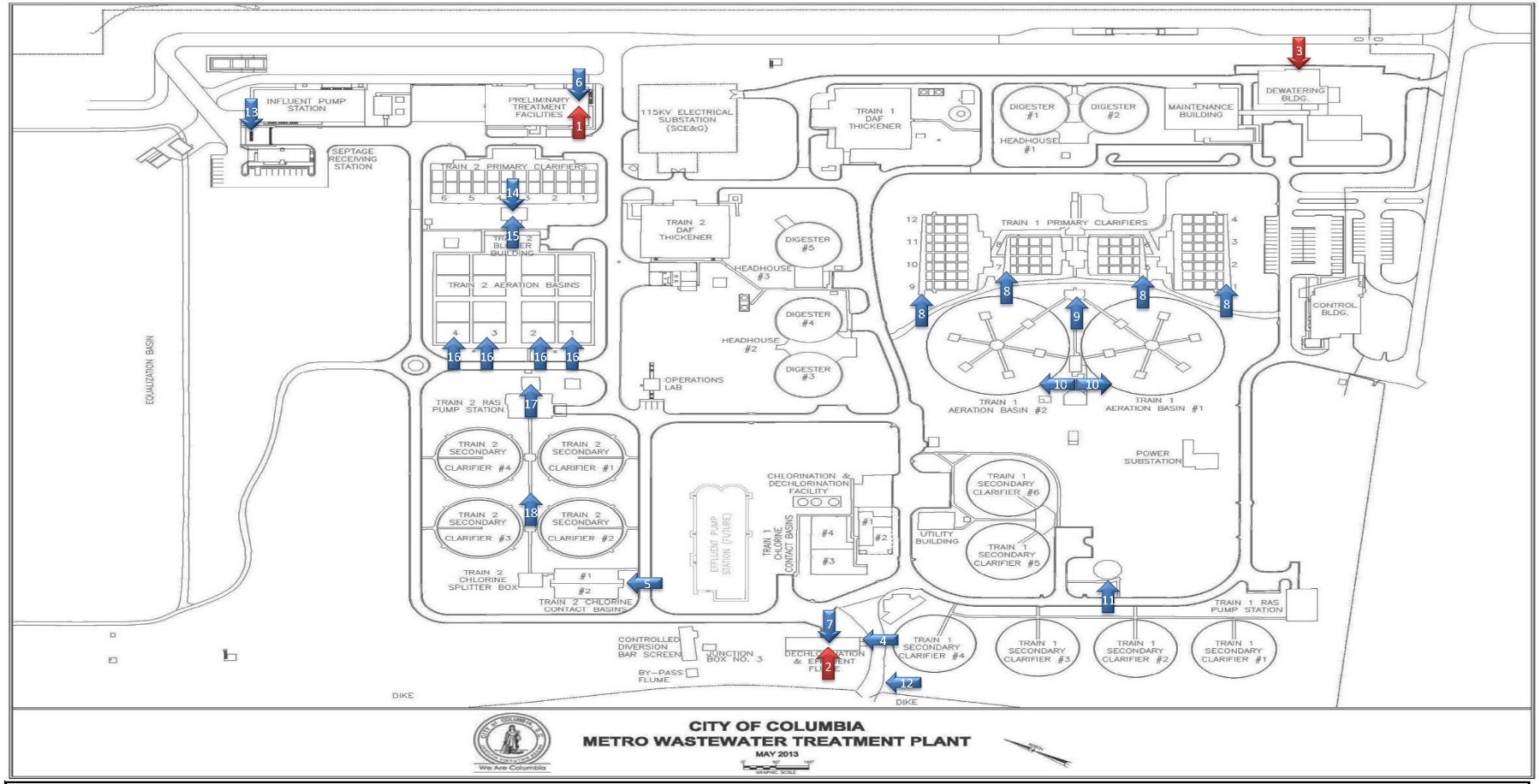
The *Metro Operations Manual* is provided with this document in electronic format.

Appendix C: Compliance Sampling Locations

Master Sampling Map

City of Columbia

Department of Utilities and Engineering - Metropolitan Wastewater System



LEGEND							
Sample Point	Sample ID	Analysis Required	Frequency	Sample Point	Sample ID	Analysis Required	Frequency
1	Influent - Compliance	BOD, TSS	Daily	9	T1 RAS - P/C	TSS	Daily
2	Effluent - Compliance	BOD, TSS, NH3, pH, DO, TRC, Fecal	Daily	10	T1 AB 1&2 - P/C	MLSS, Alkalinity	Daily
2	Effluent - Compliance	Nitrate-Nitrite, TKN, Phosphorus, Copper	Monthly	11	T1 Distribution - P/C	Settleability	Daily
2	Effluent - Compliance	Toxicity	Quarterly	12	T1 Sec. Clar. - P/C	TSS, NH3, COD, NO3, NO2, Alkalinity	Daily
3	Dewatering - Compliance	Metals (As, Cd, Pb, Cr, Ni)	Quarterly	13	Leachate - P/C	TSS, NH3, COD	Daily
4	T1 Effluent - P/C	TRC	Daily (online analyzer)	14	T2 Primary - P/C	NH3, COD, Alkalinity, Settleable solids	Daily
5	T2 Effluent - P/C	TRC	Daily (online analyzer)	15	T2 RAS - P/C	TSS	Daily
6	Influent - P/C	TSS, NH3, COD, Alk., Settleable solids	Daily	16	T2 AB 1-4 - P/C	MLSS, NH3, NO3, Alkalinity	Daily
7	Effluent - P/C	TSS, NH3, COD, Alkalinity	Daily	17	T2 Distribution - P/C	Settleability	Daily
8	T1 Primary - P/C	NH3, COD, Alkalinity, Settleable solids	Daily	18	T2 Sec. Clar. - P/C	TSS, NH3, COD, NO3, NO2, Alkalinity	Daily

*NOTE: Red arrows indicate compliance monitoring sample points.

**NOTE: Blue arrows indicate process control and monitoring sample points.