

**City of Marion
WPCC Enhancement Project
(LTCP Phase I)
Fact Sheet**

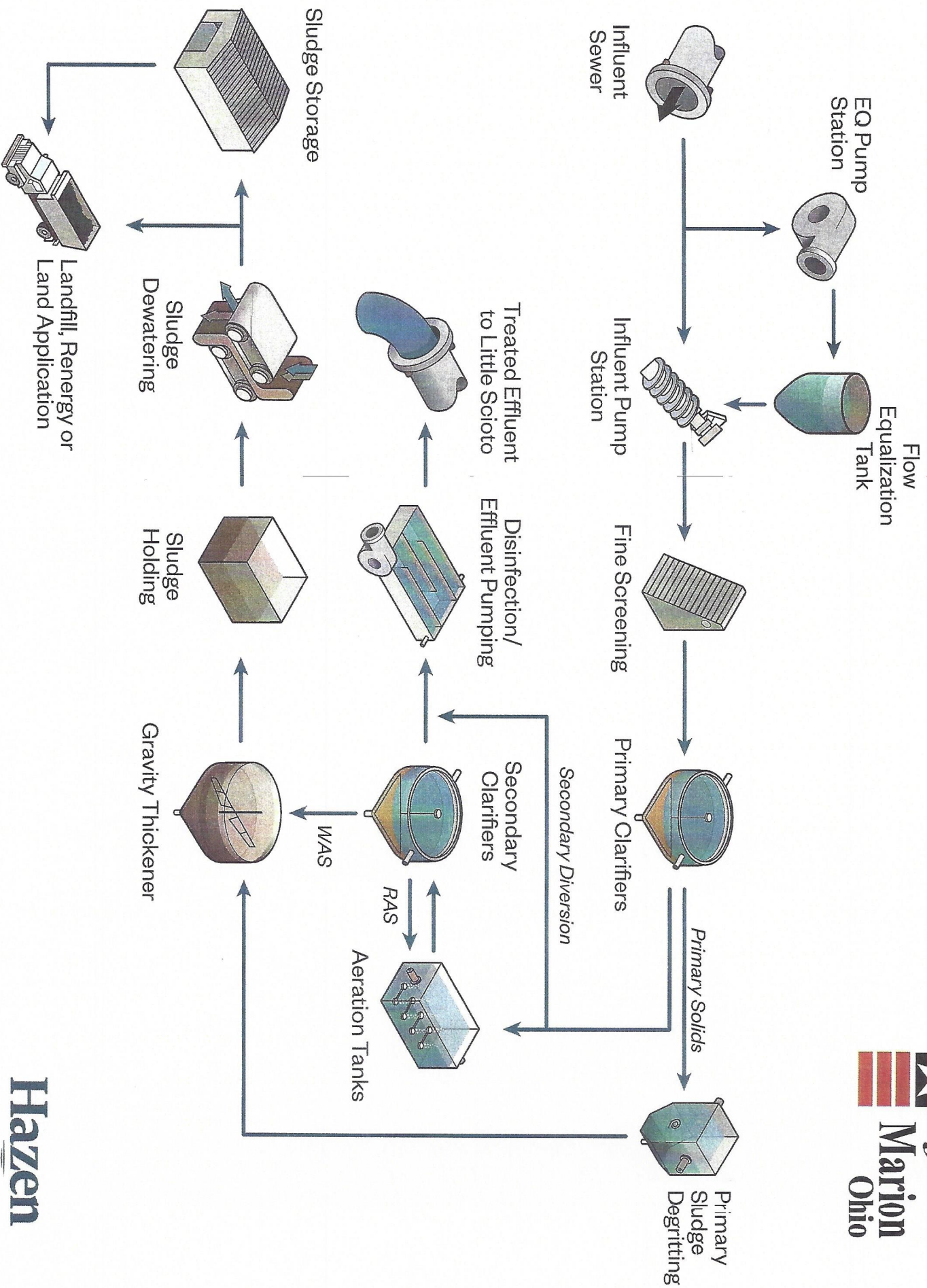
Public Meeting – March 11, 2019

- WPCC 2013 NPDES from Ohio EPA required Treatment Plant and Collection System Analysis which resulted in a Long Term Control Plan (LTCP) update.
- Submittal of LTCP and negotiation with Ohio EPA started in fall of 2016.
- City is close to finalizing terms of LTCP with Ohio EPA.
- Negotiations include LTCP schedule and projects to be completed as part of LTCP.
- WPCC Enhancement Project is the first of 7 phases currently being negotiated with Ohio EPA.
- The WPCC Enhancement project is a predecessor project to remaining phases of LTCP (this phase must be performed first).
- Total estimated cost of LTCP is \$92.0M in today dollars.
- Estimated cost for WPCC Enhancement (LTCP Phase I) project is \$28.0M, including engineering services.
- WPCC Enhancement Project (LTCP Phase I) will:
 - Reduce CSO activation at the Holland-Silver from 64 to 21 times per year.
 - Eliminate SSO at Whirlpool manhole (Whirlpool parking lot).
 - Will increase the WPCC secondary treatment capacity from 21.0 MGD to 42.0 MGD and increase the WPCC total wet weather flow capacity to 51.0 MGD.

- WPCC Enhancements include:
 - New 5.0 MG Flow Equalization Tank and associated 12.0 MGD Flow Equalization Pump Station.
 - Increased hydraulic capacity of the Primary Clarifiers by implementing Chemically Enhanced Primary Treatment (CEPT) operation for wet weather treatment.
 - Improvements to overall chemical feed system.
 - Improvements to Non-potable Water System.
 - Influent hydraulic improvements at Aeration Tanks.
 - Improvements to the Return Activated Sludge (RAS) splitting to Aeration Tanks.
 - New Secondary Clarifier flow splitting structure to allow series and parallel operation of Secondary and Tertiary Clarifiers.
 - Hydraulic improvement to increase capacity of Secondary and Tertiary Clarifiers and allow for series and parallel operations.
 - New Secondary and Tertiary Clarifier RAS Pumping
 - New Waste Activated Sludge Pumps (WAS).
 - New Disinfection and De-chlorination treatment system to treat up to 51.0 MGD.
 - New Effluent Pump Station necessary to pump flow out of WPCC during periods of high-water elevation in Little Scioto River (prevents WPCC from flooding).
 - New SCADA system for proposed improvements and plant-wide SCADA backbone.
 - Hydraulic Improvement at Holland-Silver CSO
 - Tunnel vestibules for imFAproved NFP 820 classification separation
 - Potential addition of new plant-wide backup generator.
- Bid opening for WPCC Enhancement (Phase I LTCP) on March 20, 2019.
- WPCC Enhancement (Phase I LTCP) project construction to begin June 2019.

Corresponding details of individual treatment processes can be found on WPCC Process Flow Diagram and Technical Data Sheet.

City of Marion - WPCC Process Flow Diagram



Preliminary Treatment

Number of Pumps	3
Manufacturer	Spaans Babcock
Type	Screw
Capacity	18.0 MGD (each) 54.0 MGD Total
Equalization Pumps	4
Manufacturer	Flygt
Type	Submersible
Capacity	4.0 MGD (each) 12.0 MGD Total
Equalization Basin	Pre-Stressed Concrete
Diameter	152 feet
Side Water Depth	35 feet
Operating Volume	6.0 MG
Fill time at 4.0 MGD	30 hours
Fill time at 12.0 MGD	10 hours
Number of Screens	2
Manufacturer	Headworks
Type	Mechanical Bar
Opening Size	1/4 inch
Capacity	60.0 MGD
Number of Cyclones	6
Number of Classifiers	2
Manufacturer	Wemco
Capacity Cyclones	400 GPM
Capacity Classifiers	800 GPM

Primary Clarifiers

Number of Clarifiers	4
Type	Scrapper/Hopper
Diameter	75 feet
Side Water Depth	10 feet
Weir Length	384 feet each
Volume	330,500 gallons each
SOR at 34.0 MGD	1,925 GPD/SQ.FT.
SOR at 42.0 MGD (CEPT)	2,380 GPD/SQ.FT.
SOR at 51.0 MGD (CEPT)	2,890 GPD/SQ.FT.

CEPT

Coagulant Type	Polyaluminum Chloride
Storage Volume	9,900 gallons
Dosage Range	15 - 35 mg/L as PAOL
Storage at 42.0 MGD at 30 mg/L	78 hours
Storage at 51.0 MGD at 30 mg/L	64 hours
Polymer Type	Emulsion
Storage Volume	540 gallons
Dosage Range	1.5 - 4.0 mg/L
Storage at 42.0 MGD at 3 mg/L	32 hours
Storage at 51.0 MGD at 3 mg/L	26 hours
PAOL Storage greater do to other location usage	

Secondary Treatment

Type of Treatment	2-Pass Activated Sludge
< 21.0 MGD	Plug Flow
> 21.0 MGD	Contact Stabilization
Number of Units	4
Length	150 feet/pass
Width	30 feet/pass
Side Water Depth	12.92 feet
Peak Secondary Flow	42.0 MGD
Diverted Primary Flow + Disinfect	9.0 MGD
Final Combine Peak Effluent Flow	51.0 MGD

Final Clarifiers

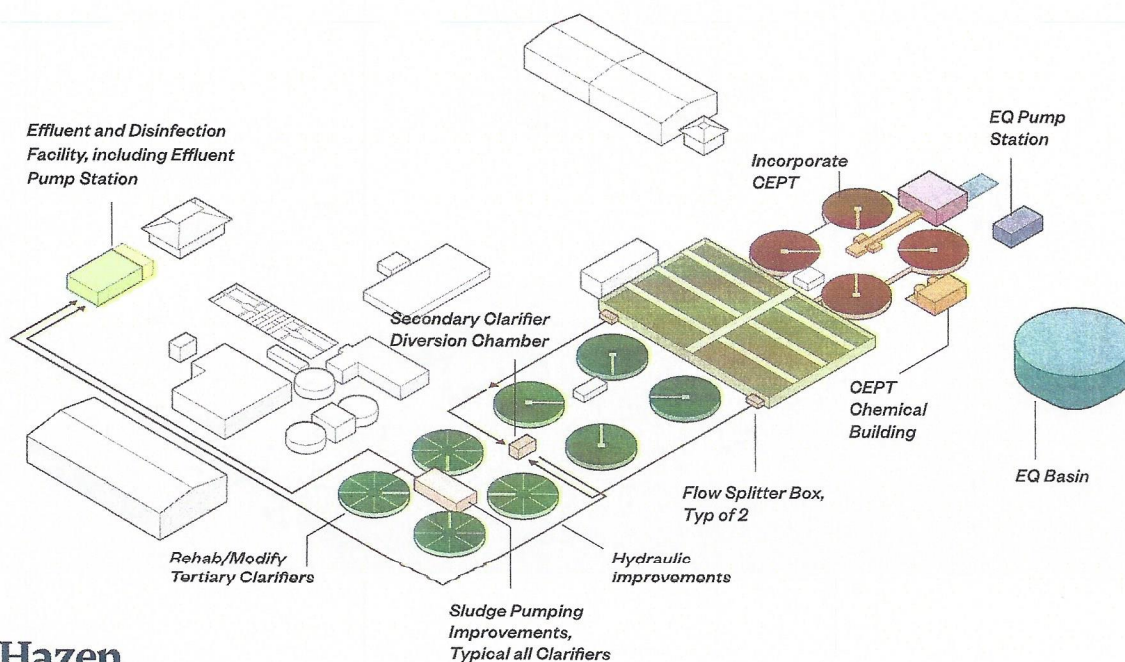
Type	Secondary/Tertiary
Number of Secondary (series)	4
Number of Tertiary (series)	4
Number in Parallel operation	6 - 8
< 21.0 MGD	Plug Flow
> 21.0 MGD	Contact Stabilization
Secondary Diameter	75 feet
Secondary SWD	11 feet
Secondary Volume Total	63,300 gallons
Secondary SOR at 21.0 MGD	1,190 GPD/SQ.FT.
Tertiary Diameter	75 feet
Tertiary SWD	14.5 feet
Tertiary Volume	479,000 gallons
Tertiary SOR at 21.0 MGD	1,190 GPD/SQ.FT.
Combined SOR at 42.0 MGD	1,190 GPD/SQ.FT.

Disinfection

Type	Sodium Hypochlorite/Sodium Bisulfite
Number of Tanks	2
Travel Length	255 feet
Width	20 feet
Side Water Depth	13.2 feet
Volume (each)	289,500 gallons
Total Volume	579,100 gallons
Detention Time at 21.0 MGD	79 minutes
Detention Time at 42.0 MGD	20 minutes
Detention Time at 51.0 MGD	15 minutes
Sodium Hypochlorite Storage	10,000 gallons
Sodium Hypochlorite Feed Rate	5-75 GPM
Sodium Hypochlorite Dose	1 - 8 mg/L
Sodium Bisulfite Storage	300 gallons
Sodium Bisulfite Feed Rate	1 - 30 GPM
Sodium Bisulfite Dose	0.5 - 4 mg/L

Effluent Pump Station

Type	Vertical Propeller
Number of Units	4
Capacity (each)	17.0 MGD
Total Capacity (firm)	51.0 MGD



Executive Summary

This document is an update of the Combined Sewer Long Term Control Plan with a No Feasible Alternatives Analysis added to determine feasible alternatives to increase flow to the Water Pollution Control Plant (WPCP) and increase secondary treatment capability at the plant. This feasibility balances cost with environmental benefit. This plan is an integrated plan that encompasses not only COSs, but sanitary sewer overflows (SSO's), and surface flooding from the storm/combined sewer system. The goals of this plan are to control Combined Sewer Overflows (CSOs) to meet the CSO Policy, to reduce the risk of basement back-ups, SSOs, and surface flooding in a cost-effective manner that takes the sanitary and storm collection system into consideration in conjunction with the WPCP capabilities. This integrated approach will facilitate a system-wide capital improvement plan that meets regulatory requirements and improves water quality, while considering cost and associated schedule for rate payers' affordability.

A new round of flow monitoring was performed in 2014 to develop a more accurate collection system model which was integrated with the hydraulic and process model of the WPCP to optimize a solution for pollution reduction. The City of Marion has a unique sewer system as many streets have a sanitary sewer that is higher in elevation than the storm sewer, resulting in some sanitary laterals being inadvertently connected to the storm sewer and some storm laterals connected to the sanitary sewer; resulting in the EPA classifying the sewer system as combined.

The city also experiences surcharging/flooding of the Columbia Storm/Combined Sewer at Vine Street and Lafayette Avenue and on Columbia at Pearl and Orchard streets. There is also periodic flooding in the Blaine Avenue and Church Street region due to insufficient storm/combined sewer capacity. Surcharging and surface flooding in the sanitary sewer system occurs downstream of the Professional Park pump station discharge location and upstream of the Jefferson St. Pump station.

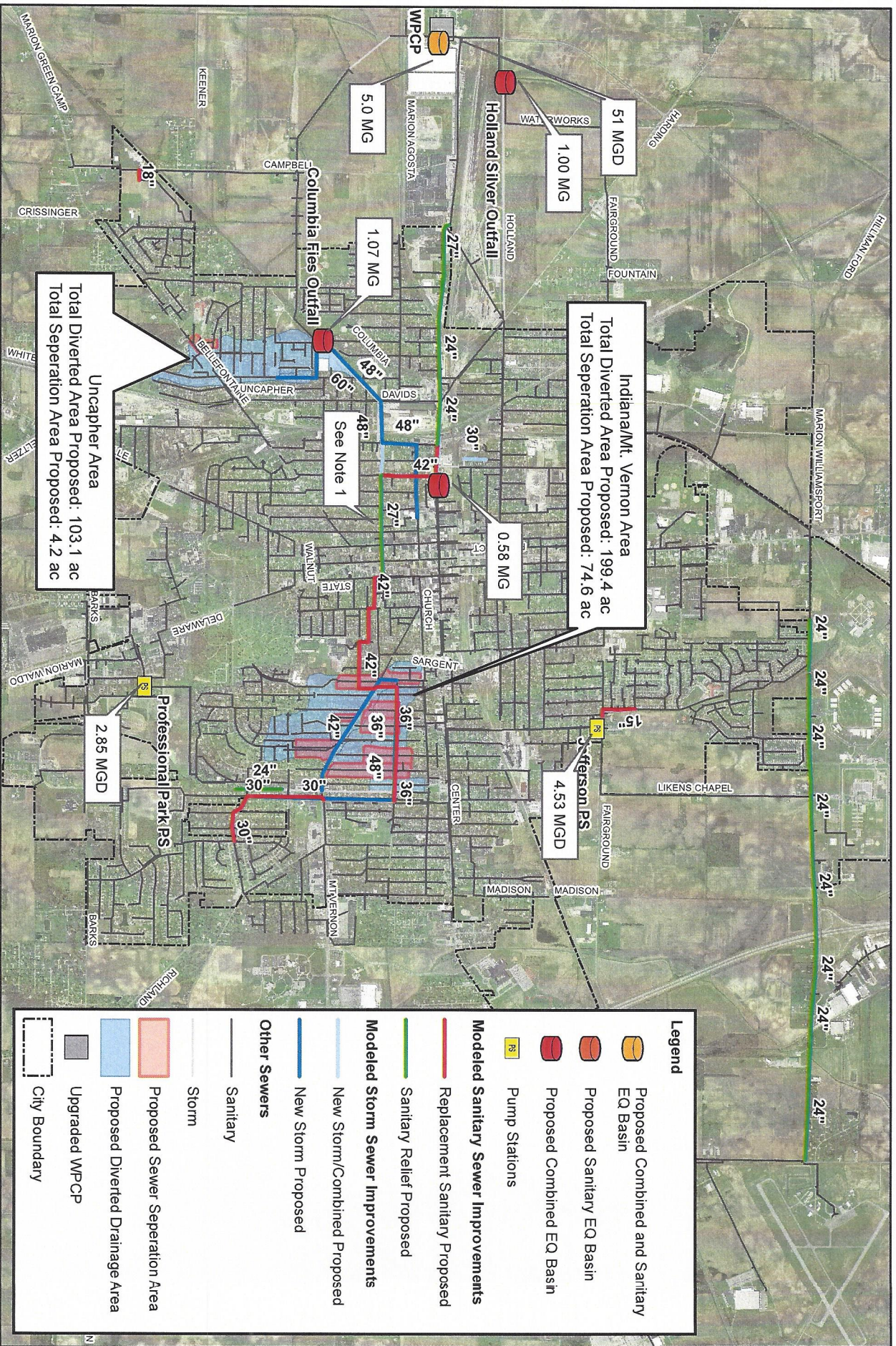
A summary of the proposed Integrated Plan projects is shown in Figure ES-1 and all projects are listed in Table ES-1 along with preliminary capital costs.

Financing of the projects will likely include a combination of Municipal Bonds and low interest loans from the Water Pollution Control Loan Fund administered by Ohio EPA Department of Environmental Financial Assistance which has terms of up to 30 years. Where feasible, grants will be sought but is unlikely to fund a significant portion of the projects.

According to the FCA, this Integrated Plan is not affordable within the time frame included in the current Director's Findings and Orders. This is due to numerous factors including the extensive needs to address aging infrastructure and the deteriorating economic conditions within the City. In order to address these challenges, a prioritization framework has been developed to support the implementation of an affordable, phased, and adaptive plan that will meet the performance goals and the City's CWA obligations in a prioritized manner. The detailed implementation plans will be developed in 5-year increments and will be based on the affordability of the projects and the City's priorities as described in Section 6. The phased approach will also be used to allow time for effectiveness measurement and any other detailed characterizations needed to refine system needs to meet the target Level of Control. Therefore it is important to note that the projects listed herein reflect the most current understanding of the system but may change based on updated information.

Table ES-1: Long Term Control Plan Projects, Costs and Benefits

LTCP Project	Capital Cost (M)
WPCP	
Influent and Effluent Pump Stations, Primary Treatment, Secondary Treatment	\$12.50
Storm Flooding Control and Stormwater Redirection Projects (CSO Reduction)	
Indiana Ave Storm Sewer Diversion	\$5.28
Mt. Vernon Ave Storm Sewer Diversion	\$3.78
Uncapher Ave Storm Sewer Diversion	\$1.57
Blaine-Church Area Flooding	\$6.34
Sewer Separation Projects	\$8.90
Combined/Storm Sewer Restrictions	\$11.72
Subtotal Storm Flooding Control and Stormwater Redirection Projects (CSO Reduction)	\$37.59
Additional CSO Control Projects (Other than Flood Control)	
CSO Equalization Basins	\$10.0
Sanitary Sewer Overflow Reduction Projects	
Sanitary Sewer Capacity Improvements	\$35.79
WPCP Peak Flow EQ Basin Cost	\$14.68
Subtotal SSO Reduction Projects	\$50.47
Total Integrated Plan Capital Cost	\$110.56



Note 1: Proposed sanitary relief connects to existing sanitary. Proposed storm/combined connects to existing storm/combined