SECTION C: PROPOSED WORK PLAN

C.1 Our Understanding & Approach
C.2 Staff Resources by Task
C.3 Project Timeline

Statement of Understanding

The City is under development pressure that is straining the sanitary sewer system. As a result, the City desires a Sanitary Sewer Collection System Comprehensive Plan (SSCSCP) to serve as a road map for capital improvements to manage flows from future growth. The City has been proactive in managing and planning upgrades to the sanitary sewer system in the past, resulting in a high level of service from the system. The City performed a footing drain disconnection (FDD) program from 2002–2012 that was very effective at reducing inflow and infiltration (I&I) and basement backups. This program was followed by the Sanitary Sewer Wet Weather Evaluation Project in 2015 and the Sanitary Sewer Improvements and Preliminary Engineering Project in 2017 that evaluated the FDD program, developed the City's design level of service, and laid out plans for managing the system that have been effective for the past ten years.

The City of Ann Arbor is experiencing densification and greater demands from new developments that are straining the sanitary sewer system and, in some cases, exceeding the capacity of the system.

The City is experiencing densification and greater demands from new developments that are straining the sanitary sewer system and, in some cases, exceeding the capacity of the system. The City is currently in the process of updating the Comprehensive Land Use Plan that is expected to reflect additional densification and growth within the City. Additionally, the wet weather flows in the sewer collection system model were developed from flow data collected in 2013. Both I&I removal efforts and normal system deterioration may have impacted the wet weather flows since 2013. The SSCSCP will facilitate an understanding of these impacts on the system so that capital improvements can be developed to serve this growth while continuing to provide the high level of service that the City and its residents expect.

Key objectives of the SSCSCP include:

1. Migrate the collection system model to InfoWorks™ and recalibrate the model using recent flow metering data to develop updated design peak wet weather flows that reflect current conditions.
2. Develop a wastewater master plan for handling projected future flows based on the Comprehensive Land Use Plan update and anticipated growth provided by other stakeholders.
3. Prepare cost estimates and a phasing plan for recommended improvements to help inform the City's capital improvement and financial planning.
4. Perform a policy and financial evaluation to help the City develop policies and funding strategies to support the recommended infrastructure improvements, which will serve as a foundation for a future capital cost recovery study to be undertaken by the City.

We are planning a modest public engagement effort for this study because the City is not changing the level of service for the system and the Comprehensive Land Use Plan includes a robust community engagement effort. As part of this SSCSCP development, we will utilize the City's public engagement toolkit, and we will develop a recommendation for a public engagement plan for each component of the SSCSCP.

Development pressure is straining the sanitary sewer so OHM Advisors will make the SSCSCP a priority project, but it is also important not to rush the development of the SSCSCP that will serve the City for decades to come. We have developed a sufficient project schedule to give this project the care and time that it deserves, and we have included an as-needed allowance task to address short-term analyses more quickly when development pressure demands.

Project Approach

This section details our team's approach to executing the project and how we plan to meet and exceed the City's requirements for this project. The Project Approach includes our detailed Scope of Work that identifies the individual steps that we will take to perform and deliver upon each required task. Every task included in the SSCSCP RFP has been covered in OHM's Proposed Work Plan, but they have been reorganized so they are presented to follow the flow of work as it would be completed. The following table details each task in the RFP and where it can be found in OHM's Proposed Work Plan.

Table 1. Where the SSCSCP RFP Tasks are addressed in the OHM Work Plan

SSCSCP RFP Task Number	OHM Work Plan Task Number	Task Description
1)	3	Update and recalibrate the hydraulic model
a.	3.C	Utilize flow meter data for establishing dry and wet weather conditions
b.	3.B	Update hydraulic model from GIS database
c.	3.A	Migrate model to InfoWorks™ software
d.	3.B	Update hydraulic model with planned capital improvement projects
e.	3.D	Utilize City's water meter billing data for determining flow allocation
2)	4.D and 4.F	Perform hydraulic analysis of collection system and identify capacity constraints with recommendations to meet current and future demands
a.	4.C	Organizations to engage for future growth projections
b.	4.A	Evaluate dry and wet weather conditions
c.	4.B, 4.E and 4.F	Compare the City's design event versus EGLE regulatory event
d.	4.C	Future conditions shall align with recommendations from the City's Planning Department Comprehensive Land Use Plan
e.	4.C	Include a collection system build out for township island areas
3)	5.A	Perform capacity assessment on the City's wastewater treatment plant
4)	6.A	Provide an implementation strategy for the recommended plan
5)	1.D	Conduct site investigations to confirm information
6)	7	Provide an overview of the hydraulic model
7)	6.B	Recommend on-going flow monitoring plan
8)	4.D	Identify low points in the system where SSO events or backups may be at high risk
9)	2.A	Identify areas with high rates of infiltration and inflow (I&I)
10)	4.F	Identify and review key bypass points in the collection system
11)	4.G	Delivery of model scenarios
12)	5.B	Review of existing city/township wastewater service agreements
a.	5.B	Hydraulic analysis to ensure adequate collection system and plant capacity to service contract flow amounts
b.	5.B	Perform analysis of available capacity for future agreement opportunities
c.	2.A	Recommend strategies for limiting infiltration and inflow from townships
13)	1.C	Identify any present and future regulatory concerns
14)	7	Provide training for up to four (4) city staff members on use of InfoWorks™ model
15)	8	Consultant shall include an initial engagement strategy
N/A	9	Policy and Financial Evaluation

TASK 1: PROJECT INITIATION AND INFORMATION GATHERING

OHM has been extensively involved in performing many of the City's previous sanitary sewer studies over the past ten years and is very familiar with the system's history and areas of concern. This historical knowledge will assist with OHM's review of available background information and previous studies. In addition to reviewing available information, OHM will also engage in discussions with City staff, operators, and applicable stakeholders to understand other valuable insights that may not be documented.

Task 1.A – Project Management

Project Meetings

Consistent, clear, and effective communication amongst the Project Team members (City of Ann Arbor, OHM Advisors, and Stakeholders) is key to a successful project, while keeping in mind the City's goals and objectives for the project. This will be achieved through regularly scheduled meetings of the Project Team as coordinated by the OHM Project Manager. The associated efforts for these meetings have been included within the technical tasks described subsequent to this section. Specific work sub-tasks will include the following:

- After the Notice to Proceed from the City, OHM will schedule a Project Kick-Off Meeting with the City's Project Manager and key project staff to review and confirm the project scope, review the project schedule, and to establish the Project Team's roles and responsibilities.
- Project check-in/status meetings will be held bi-weekly with the City's Project Manager. This standing meeting will occasionally be used for more extensive discussions with other City stakeholders as-needed. Project progress and key work products will be reviewed, and key milestones and delivery dates will be identified. It is anticipated that the project status meetings will be conducted virtually.
- Broader team check-in meetings that include the City's key leadership and staff involved with the project as well as OHM project team members will be held every two months to review key findings and milestones. These meetings will be held at the City.
- Technical break-out meetings will be scheduled as-needed at appropriate milestones in the progression of the technical work. These will be a mixture of virtual and in-person meetings as dictated by the needs of the technical task meeting.

Project Management

This project offers the opportunity to create a valuable and long-lasting SSCSCP, thus demanding a rigorous approach to team organization, communication, and project delivery. We will establish and implement sound project management strategies from the onset of the project and continuously employ them during the work. The scope and schedule outlined here will become our guiding project management plan (PMP) during project execution and will be reviewed with the City at the progress meetings discussed above. Regular review of the PMP with the City will help track the project progress against the schedule and keep the work tasks focused on the City's desired scope and direction for the project.

Together, the team of Robert Czachorski as the Principal-in-Charge (PIC) and Mackenzie Chamberlain as the Project Manager (PM) will be responsible for the successful delivery of the project. As PIC, Robert is responsible for overall client satisfaction, contract management, and assembling and maintaining an effective team to execute the project. As PM, Mackenzie will be responsible for day-to-day management and execution of the project, including managing the team, and developing our project deliverables within the specified schedule and budget. Effective project management will be central to our approach, enabling us to maintain open and effective communication through the project's lifecycle. This will encompass defining clear goals and objectives to steer project development, maintain and monitor schedule and milestones, and control project costs.

Quality Assurance & Quality Control (QA/QC) Plan

Quality is a fundamental project goal of OHM Advisors. Project quality begins with a team commitment to produce a quality work product consistent with our clients' goals and expectations. All members of the team are responsible for quality control and producing a quality work product that meets the standards of care and has an appropriate review by senior staff. Quality assurance and the implementation of processes and procedures to systematically produce a quality project

are the responsibility of the PIC and PM. Additionally, we included Cresson Slotten in a QA/QC role to provide a historical perspective and review the overall project direction and deliverables to help keep the project focused on the City's needs and expectations.

Sound project management and effective communication are critical components. OHM's commitment to excellence is what we strive for and is demonstrated as part of our comprehensive QA/QC program. QA/QC reviews will be performed at all critical milestones in the project. Time to perform project reviews is included within the project schedule. Reviews are tracked and documented by each team member to verify completion of the review. The results of our robust QA/QC program benefit our team and the City by delivering on-time, within-budget projects.

Task 1.B – Information Gathering

OHM will perform a detailed desktop review of available background information associated with the City's sanitary sewer system. The previous studies and analyses listed in the RFP will be reviewed and incorporated.

Additionally, OHM will compile a data request letter outlining information needed for this project. OHM anticipates collecting, reviewing, and assessing the following information, some of which may be requested to be provided by the City:

- InfoSWMM™ hydraulic model
- Sanitary System Geographical Information System (GIS)
  - » Sanitary sewers, sanitary manholes, lift stations
- Available flow meter, level sensor, and rain gauge data from current and previous flow metering efforts
- City's Comprehensive Land Use Plan
- Previous two (2) years of water meter billing data
- CCTV inspection videos, reports, and records for sanitary sewer mains and manholes
- Parcels with disconnected footing drains
- As-built plans for public streets, water mains, storm sewers, and sanitary sewers, as requested
- Historical incident reports of basement backups and sanitary sewer overflows
- Wastewater service agreements with connected Townships
- Available Supervisory Control and Data Acquisition (SCADA) data at wastewater treatment plant and lift stations
- Design capacities of each treatment process within the wastewater treatment plant
- Pump curves of the pumps at the wastewater treatment plant and at the lift stations of interest for this study

Task 1.C – Regulatory Review

As part of this task, OHM will identify any present or future regulatory concerns for the City's collection system. With the assistance of consultants and local system operators, EGLE has developed a draft General Permit for wastewater collection systems. Although the draft permit is not yet in effect, it provides insights into potential future regulatory requirements with which municipal wastewater systems will need to comply. OHM will review EGLE's draft General Permit requirements and will evaluate and document the City's compliance with each. OHM will then provide recommended actions for the City to take to address potential future regulatory deficiencies or concerns.

Task 1.D – Site Investigations

Through the review of the numerous sanitary sewer studies that have been performed over the past two decades, OHM expects to have a good understanding of the City's collection system and anticipates the hydraulic model to quite accurately reflect existing conditions as a result of its many updates and refinements over the years. As such, a substantial information verification effort is not anticipated. However, upon review of the information provided, site investigations may be necessary to confirm or verify information presented in record drawings or in previous sanitary sewer studies. OHM proposes to provide a two-person crew to perform up to two, full-day (8-hour) mobilizations to conduct site investigations or field reconnaissance to confirm or verify information, as needed. Site investigations may take place at locations within the City's collection system or at the wastewater treatment plant. OHM will coordinate the scheduling of planned site investigations with City staff prior to mobilizing.

Task 1 Deliverables

Each major project task will be summarized into a volume of the final report. This will allow the team to document their work progress as it is completed. Each

major task will represent a volume in the final report that will be delivered in electronic and hard copy formats.

As part of this task, OHM will summarize the Task 1 efforts into a System Overview introductory section of the final report. A draft version of this section of the report will be provided to the City for review, then the document will be finalized upon incorporation of the City's comments. One electronic and two hard copies of the finalized section will be submitted to the City.

SSCSCP Report Volumes	
#	Volume Title
1	Flow Metering Data Analysis and Inflow and Infiltration Evaluation
2	Hydraulic Model Update
3	Hydraulic Analysis and Recommended Improvements
4	Capacity Assessment of Wastewater Facilities
5	Phasing Strategy for Improvements
6	InfoWorks™ Training Materials
7	Public Engagement
8	Policy and Financial Evaluation

The System Overview section will include the following information:

- Summary of system operations
- Previous study report review matrix
- Matrix of draft General Permit requirements and City compliance with each
- Recommendation of actions for the City to take to address regulatory deficiencies or concerns
- Summary of site investigation findings
- Meeting materials including agendas, minutes, and presentations

TASK 2: FLOW METERING DATA ANALYSIS AND INFLOW AND INFILTRATION EVALUATION

Under this task, OHM proposes to review current and historic flow metering data to assess the magnitude of inflow and infiltration (I&I) throughout the collection system and at the Township connections. I&I is comprised of stormwater and groundwater that enter the collection system through a variety of pathways such as through pipe and manhole defects, connected footing drains and roof drains, and cross connections with the stormwater collection system. The City desires to minimize I&I contributions in order to reduce the amount of flow that is conveyed, pumped, and treated, thereby reducing operation and maintenance needs and costs of the wastewater facilities and collection system.

Task 2.A – Flow Metering Data Analysis and Inflow and Infiltration Evaluation

As part of this effort, OHM will analyze the flow metering data to identify tributary areas that have high peaking factors and rainfall capture fractions. A peaking factor is the ratio of the peak flow (during wet weather events) to the average or base flow (during dry weather). High peaking factors indicate a higher presence of rainfall-dependent I&I. The Ten States Standards for new systems has a maximum peaking factor of about 4, which is a good benchmark for a system with a relatively low presence of I&I. A rainfall capture fraction indicates the percentage of rainfall that was received, or captured, by the sanitary sewer collection system during a wet weather event. A higher rainfall capture fraction indicates a higher presence of rainfall-dependent I&I.

Flow metering data will be used to quantify the magnitude of I&I in each of the flow meters' tributary areas. OHM will then develop recommendations for further investigating and removing sources of I&I in those tributary areas and Townships with high I&I. Specific work efforts under this task include the following:

- Analyze flow metering data and lift station flow data to quantify the rainfall-dependent I&I in the areas tributary to each flow meter and lift station.
- Compare flow metering data from previous flow meter deployments to current flow metering data to identify changes in flow characteristics over time. The flow metering data will be compared in three ways:
  - » Tabulate and compare I&I metrics including peaking factors and rainfall capture fractions.
  - » Perform meter correlations between two meters installed at the same location in different years to identify trends and differences in their tributary areas' flow characteristics and I&I metrics over time.

  - » In locations that are currently metered and have also been metered in years past, compare current flow metering data to the antecedent moisture (AM) models that were developed by OHM as part of the 2015 Sanitary Sewer Wet Weather Evaluation Project to determine whether the current flow metering data shifts away from the AM model predictions at those locations.
- Identify tributary areas that have high I&I based on their wet weather peaking factors and rainfall capture fractions as categorized below:
  - » Peaking Factor
    - * High: Greater than 20
    - * Medium: 4-20
    - * Low: Less than 4
  - » Rainfall Capture Fraction
    - * High: Greater than 10%
    - * Medium: 2-10%
    - * Low: Less than 2%
- Compare the locations of the tributary areas with high I&I to locations where footing drain disconnections (FDD) have been completed.
- Review available CCTV data in those tributary areas with high I&I.
- Develop recommendations for investigating and reducing I&I in those tributary areas with high peaking factors and rainfall capture fractions.
- Develop planning-level cost estimates to perform recommended investigations of I&I sources.
- Analyze Township master meter flow data (if available) to quantify the rainfall-dependent I&I in the Townships tributary to each master meter.
- Identify Townships that have high I&I based on their wet weather peaking factors and rainfall capture fractions.
- Compare the Townships' peak flow rates to their contract flow rates.
- Develop recommendations for investigating and reducing I&I in the Townships with high I&I.

Task 2 Deliverables

As part of this task, OHM will summarize the Task 2 efforts into **Volume 1: Flow Metering Data Analysis and Inflow and Infiltration Evaluation** of the final report. A draft version of Volume 1 will be provided to the City for review, then the document will be finalized upon incorporation of the City's comments. One electronic and two hard copies of the finalized Volume 1 will be submitted to the City. Volume 1 will include the following information:

- Summary of flow metering data analysis and I&I metric calculations
- Summary and map of tributary areas and Townships with high I&I
- Map of locations with FDD and identified sources of I&I
- Recommendations for investigating and reducing I&I within the collection system and in the Townships

TASK 3: HYDRAULIC MODEL UPDATE AND CALIBRATION

A hydraulic model can be a valuable tool to assess the health of a sanitary system under different planning, operational, and wet weather conditions. The City's hydraulic model is generally in good shape and has been well maintained to reflect the collection system over the years. However, the wet weather flows in the model were developed from flow data collected in 2013. Both I&I removal efforts and normal system deterioration may have impacted the wet weather flows since 2013, which necessitates an update to the wet weather model calibration. With this in mid, the hydraulic model update includes the following:

- Infrastructure Updates
- Model Calibration Based on Current Conditions
- Operational Updates

Each of these components interconnects to create confidence in the model. Therefore, having trust in each of these elements will result in a valuable model for system planning purposes.

Task 3.A – Model Migration to InfoWorks™

With the sunsetting of the InfoSWMM™ model platform that currently houses the City's sanitary sewer model, the model will be migrated to InfoWorks™ to maintain access to software updates and technical support into the future. The model will be migrated to InfoWorks™ then updated and calibrated.

Migration of the model will include the following tasks:

- Migrate the model to InfoWorks™.
- Test the model under three key scenarios and confirm that the new software platform performs similarly to InfoSWMM™.
- Document any changes needed to reproduce the InfoSWMM™ output or achieve improved flow accuracy or visualization.

Task 3.B – Update Hydraulic Model with GIS Information, Capital Improvement Projects, and Operational Settings

The hydraulic model will be further updated by adding recent capital improvement projects, sanitary sewer extensions, and lining projects. Planned capital improvement and lining projects necessary to model future conditions will also be added to the model for the 10-year and 20-year growth model scenarios. Flows received from Scio, Pittsfield, and Ann Arbor Townships will be set to their contract maximums. OHM will also coordinate with City staff and operators as needed to confirm operations of the City-owned lift stations in order to accurately reflect their operation in the model.

Specific tasks included in Task 3.B include the following:

- Add recent lining work to the model.
- Add sanitary sewer extensions to new developments to the model.
- Add planned Capital Improvement Projects to the model.
- Verify that Township flow contributions are set to their contract maximum limits.
- Confirm typical operations of City-owned lift stations during dry and wet weather.

Task 3.C – Utilize Flow Meter Data to Establish Wet and Dry Weather Conditions

The first step in updating the hydraulic model will be to establish present dry and wet weather conditions. The City deployed 15 flow meters throughout the collection system in 2023 that have been gathering data to characterize present flow conditions. System characterization is further supported by data from flow meters at the Ann Arbor Wastewater Treatment Plant as well as data from five City rain gauges. The data will collectively be utilized to update and calibrate the hydraulic model.

Data from the flow meters will be analyzed within the H2Ometrics software platform. H2Ometrics is an analytics software that is used to quantify the effects of soil wetness or dryness on inflow and infiltration into sewer systems. It is especially valuable in developing antecedent moisture models (AMMs) to predict the magnitude of flow into the sanitary system that can be expected from various wetness conditions and storms of varying sizes. AMMs are used to create a continuous hydrologic model that predicts the effects of the wet weather response at multiple points in the sanitary system. The AMMs will be calibrated to the data collected since 2023 and will use varying storm events. The AMMs will take into consideration the ground's preceding moisture content and predict the sewershed response over an extended period using rainfall and air temperature data.

Calibrated AMMs are analyzed for model bias and predictive accuracy by quantifying the accuracy of fit for peak flows and volumes for each storm event. Once calibrated, AMMs are used to perform frequency analyses to estimate the peak flow for various return periods. This is completed by using long-term climatological data sets of rainfall and air temperature, readily available through national weather services, and then performing a statistical analysis on the flow output. Because the long-term data sets contain a variety of storms as well as air temperature variations and wetness conditions, the long-term model output includes a flow frequency content that reflects a wide variety of antecedent conditions and storms. The long-term model flow response is then used to determine the probability of a flow to occur, such as the 25-year frequency design event. The design events are then validated using past flow data and expected flow responses at metering locations. The updated design event will then be incorporated into the hydraulic model for use in the hydraulic analysis.

Data from five of the flow meters along major sewer interceptors will be analyzed to develop AMMs and frequency analyses. Up to an additional three AMMs will be developed on flow meters in more upgradient portions of the sanitary network where needed. These results will be summarized into a section of the final report with the calibration plots, accuracy of fits, and frequency analysis results.

Specific work items performed as part of this task include the following:

- Analyze the flow meter and rain data utilizing the H2Ometrics platform.
- Perform AMM for up to five flow meters along major sewer interceptors and up to three flow meters in upgradient portions of the system.
- Quantify the AMM performance with an accuracy of fit analysis that compares modeled versus observed flows.
- Develop the 25-year frequency design event.
- Compare AMM results to previous model peak flows and extend the results to other meters that did not have AMM performed.

Task 3.D – Update Flow in Upstream Portions of the Model

It is expected that the flow distribution is accurately represented throughout most of the model. However, in locations where there are discrepancies between the flow metering data and the modeled flows, the City's water meter billing data may be used to estimate and distribute dry weather (base) flows. This may especially be the case in the more upstream reaches of the collection system. It is anticipated that no more than 10% of the model will require adjustments to the dry weather flow distribution.

Specific tasks included in Task 3.D include the following:

- Compare model-predicted baseflow to flow meter data.
- Identify locations where there is a discrepancy between model dry weather flow and meter data.
- Update dry weather flow from water meter billing data where necessary.

Task 3 Deliverables

As part of this task, OHM will summarize the Task 3 efforts into **Volume 2: Hydraulic Model Update** of the final report. A draft version of Volume 2 will be provided to the City for review, then the document will be finalized upon incorporation of the City's comments. One electronic and two hard copies of the finalized Volume 2 will be submitted to the City. Volume 2 will include the following information:

- Model software migration process
- Documentation of model updates inclusive of flow distribution updates
- Antecedent Moisture Model development process inclusive of AMM creation, accuracy of fits, validation, frequency analyses, and peak flow development processes

TASK 4: HYDRAULIC ANALYSIS AND RECOMMENDED IMPROVEMENTS

Upon successful completion of Task 3: Hydraulic Model Update and Calibration, we will proceed with Task 4: Hydraulic Analysis and Recommended Improvements. This critical task encompasses a comprehensive evaluation of the City's collection system and an assessment of its ability to meet both current and future capacity needs as well as regulatory requirements and City design standards. The analysis will assess the City's system and its performance under existing and anticipated future demand scenarios, and identify improvements needed to meet current and future growth needs.

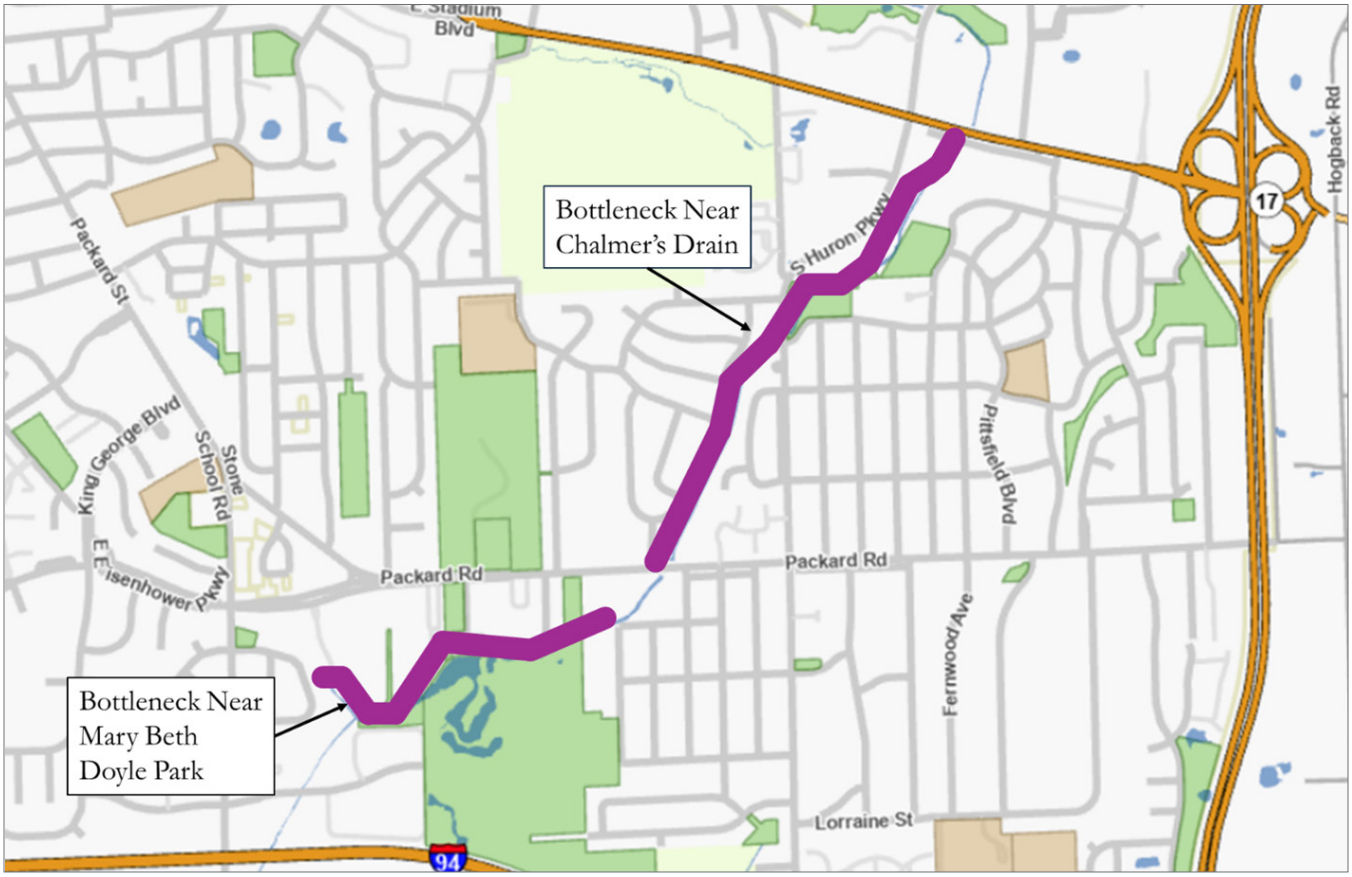
Task 4.A – Existing Conditions Evaluation

Task 4.A will evaluate capacity constraints within the collection system under existing conditions. The evaluation will be performed under dry weather and wet weather flow conditions. An example of existing capacity constraints is shown in Figure 1 (*on the following page*), which depicts locations near Mary Beth Doyle Park and Chalmers Drain where sewer capacity constraints are expected to exist under wet weather conditions. The wet weather flow scenario will use the City's design event of a 25-year recurrence interval peak sanitary flow plus 10% additional peak flow to accommodate for climate change and/or additional future growth. OHM will verity that the Township flows are set to their contract maximums.

Specific work items under this task include the following:

- Identify capacity constraints under existing dry and wet weather conditions.
- Tabulate flows and the extent of surcharging under dry and wet weather conditions.
- Prepare a map to illustrate locations with capacity constraints.

Figure 1.
Existing Capacity Constraints in the Sanitary Interceptors Near Mary Beth Doyle Park and Chalmer's Drain



Task 4.B – Existing Conditions Evaluation under EGLE and City Design Event

To prioritize capital improvement projects, peak flows under existing conditions will be evaluated against the Michigan Department of Environment, Great Lakes, and Energy (EGLE) 10-year recurrence interval design storm and the City's 25-year recurrence interval design storm. This evaluation will identify capacity constraints that occur during EGLE's 10-year design event and the City's 25-year design event under existing conditions. The hydraulic analysis of existing conditions under EGLE's design event will also be utilized to facilitate the permitting process for new developments by identifying projects that could be permitted through EGLE without the need for sanitary improvements.

Specific work items under this task include the following:

- Identify capacity constraints that exist under the EGLE 10-Year Recurrence Interval design storm for existing conditions.
- Identify capacity constraints that exist under the City's 25-year Recurrence Interval design storm for existing conditions.

Task 4.C – Establish Future Conditions

It is understood that the City Planning Department is developing a Comprehensive Land Use Plan that identifies anticipated areas of growth and densification. This effort will incorporate known developments including the University of Michigan housing expansions and future growth of the two approved transit corridors located at the intersection of Jackson Avenue and Maple Road and near the Briarwood Mall as well as the two proposed transit corridors at Plymouth Road and US 23 and Washtenaw Avenue and US 23. OHM has been working with preliminary growth projections provided by the City's Planning Department to evaluate the effects of growth on the sanitary sewer system and will work closely with the City to obtain updated growth projection information as it becomes available.

The first step in this analysis will be to compile predictions of future dry weather flows within the collection system from the local planning organizations within the City including the City of Ann Arbor Planning Department, the University of Michigan, Ann Arbor Public Schools, and the surrounding Townships served by the collection system. OHM proposes to collect contact information from the City and meet with each organization to introduce the project and review their growth projections. The project team will then summarize each organization's projected growth.

It is anticipated that the City will extend sanitary sewer service to the township island areas located within the City limits. Dry weather sanitary flow from these areas will be added to the future conditions model scenarios based on water meter billing data where available, otherwise the dry weather flow estimates will be based on industry-standard average residential usage per capita.

The collective growth projections will then be mapped and tabulated in terms of residential equivalent units (REUs) and flow rates. OHM proposes to summarize the results by meter districts, or sections of the City served by each flow meter deployed along the major sewer interceptors. The growth projections will be tabulated and compared to each meter district's existing population and flows based on raw numbers and percentages. The projections will then be reviewed with the City and the City's Planning Department. Once finalized, the modified growth predictions will be included in the model.

Future wet weather demand estimates will be built with assistance from the Office of Sustainability and Innovations (OSI) and the City regarding climate adaptation goals. OHM proposes to reach out to OSI and review the process used to develop the previous model scenario (25-year plus 10%) that was utilized in the 2015 Sanitary Sewer Wet Weather Evaluation Project. In this meeting, the project team will request an update on OSI's climate adaptation research efforts. The design event model scenario will be updated to accommodate anticipated climate change projections established through discussions with OSI, if needed.

Specific work items under this task include the following:

- Meet with local planning organizations and compile growth predictions.
- Establish flow predictions for future connection/build out of township islands.
- Develop modified flow projections by meter district.
- Update the model with the future growth projected flows.
- Incorporate climate adaptation goals from the Office of Sustainability and Innovations (OSI).

Task 4.D – SSO and Basement Backup Risk Evaluation

Basement backups and sanitary sewer overflows (SSOs) can occur in low lying locations especially when pipes are overcapacity or blocked by debris. OHM proposes to identify locations with a high risk of SSOs and basement backups under existing conditions and under the 10-year and 20-year growth projections using the City's design event. OHM will work with the City to identify which future growth land use scenario to utilize in this evaluation. OHM will evaluate locations that may be at high risk for SSOs or basement backups, such as locations where the sanitary sewer hydraulic grade line is within eight feet of the ground elevation or where capacity constraints exist under design event conditions. In locations where parallel pipes are present, OHM proposes to evaluate the locations of sanitary lateral connections and records of footing drain disconnections to provide a more accurate representation of individual properties that may be at risk. Maps of locations at risk for SSOs and/or basement backups will be provided for existing conditions as well as the 10-year and 20-year growth scenarios. The outcome from this task will inform the improvements evaluated in the Future Growth Evaluation. Specific work items under this task include the following:

- Create a map of locations with a high risk of SSOs and basement backups using the City's design storm and the most aggressive land use scenarios.
- Refine the map locations based on sanitary lateral connection information and records of footing drain disconnections.

Task 4.E – Identify Capacity Constraints Under Future Growth Projections

Task 4.E explores how future conditions are anticipated to put additional stresses on the collection system. Since future conditions are estimates, the magnitude of future peak flows will be simulated under multiple growth scenarios to capture the range of possible impacts from future growth.

It is understood that the City's Planning Department will develop several land use scenarios as part of the Comprehensive Land Use Plan that will each have different planning time periods (10-year and 20-year). OHM proposes to calculate the 10-year and 20-year peak flow projections utilizing input from stakeholder discussions as well as planning projection information provided in the Comprehensive Land Use Plan developed by the City's Planning Department.

The project team will evaluate capacity constraints for future conditions consistent with the Land Use Plan for up to three land use scenarios in each the 10-year and 20-year time periods based on the City's design event. The most aggressive 20-year growth scenario will also be evaluated under the EGLE design event to help prioritize improvements for the phasing plan.

Specific work items under Task 4.E include the following:

- Tabulate the magnitude of capacity constraints based on the City's 25-year design event under the 10-year and 20-year growth projections.
- Tabulate the magnitude of capacity constraints based on EGLE's 10-year design event for the 20-year planning period for the most aggressive land use scenario.
- Create maps to illustrate the locations of capacity constraints under each set of scenarios.

4.F – Develop Improvement Alternatives

Potential alternatives will be identified to address each capacity constraint that considers source reduction, storage, and conveyance improvements. Up to three alternatives will be considered for each upgrade needed, but not all alternatives will warrant three alternatives if the needed improvement is obvious.

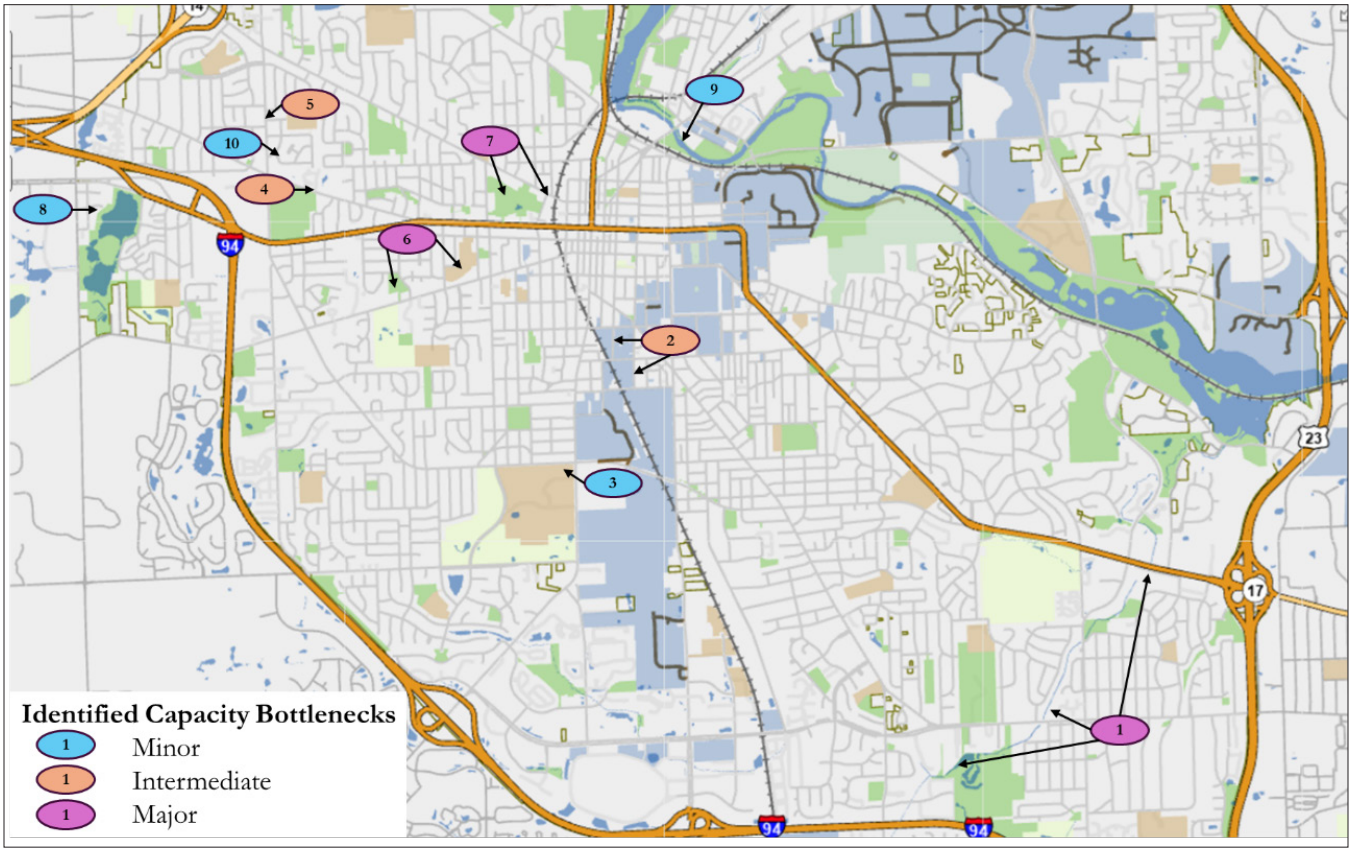
Potential alternatives will be considered for the major upgrades needed (as defined below) based on criteria to be established in coordination with the City including costs, constructability, community impacts, environmental impacts, sustainability, climate change impacts, and other factors. The recommended alternative will be documented and weighed according to the advantages and disadvantages of each. OHM proposes to work closely with the City to identify the recommended alternatives that best meet the City's long-term goals.

Conceptual engineering layouts of the recommended improvements will be developed and will be scaled and sized appropriately to meet the EGLE design event and the City's design event. This process will include field reconnaissance of the project and examination of available as-built drawings of the area. A conceptual GIS sketch will be developed for each recommended improvement. No survey or subsurface investigation will be performed as part of this preliminary analysis. Conceptual-level cost estimates of the recommended improvements will be developed for the City's financial and capital improvement planning.

It is important to clearly define a level of effort included within this task because the impacts of growth on the collection system will not be known until the Land Use Plan is complete and hydraulic modeling has been performed to understand the extent and magnitude of the improvements needed. For this reason, we have assumed the following level of effort for this task:

- For minor capacity constraints where a single stretch of pipe is overloaded and the improvement necessary is obvious, such as installation of a relief sewer or pipe upsizing, we will use the model to size the upgrade and develop a conceptual-level improvement layout and cost estimate. We anticipate that ten such minor improvements will need to be evaluated.
- We anticipate that there will be some capacity constraints that require more modeling and conceptual engineering evaluation than the minor capacity constraints. For these intermediate capacity restrictions, we will evaluate and model several localized improvement options to facilitate selection of the best option. We will then perform conceptual engineering and prepare a cost estimate for the recommended improvement. This will be the case for projects such as improvements to the local sewers near the U of M Housing project on South 5th Avenue or improvements at Veterans Memorial Park. We have assumed that this intermediate level of analysis will be needed at up to five (5) locations.
- For major interceptor restrictions, such as the known restrictions near Mary Beth Doyle Park and near the Chalmers Drain, a more extensive evaluation will be required. The level of effort for these areas will be similar to the recently completed evaluation of the Miller and First Street capacity restrictions evaluated for the U of M housing project. These evaluations

Figure 2.
Identified Sanitary Capacity Bottlenecks Observed Under Preliminary Master Planning Level Flows and Color Coded Based on the Anticipated Magnitude of Projected Effort



will include an examination of local and regional options for improvement as well as an alternative analysis using an evaluation criteria matrix with conceptual engineering and cost estimates prepared for each alternative. This level of evaluation will be the crux of the SSCSCP and the output from this work will function as the road map for the collection system for the coming decades. We have assumed that this major level of analysis will be needed at up to four (4) locations in the system.

- Should additional improvement evaluations be needed based on the results of the hydraulic modeling beyond these assumed amounts, they can be performed under the additional as-needed task described at the end of the technical scope. We would provide the City with a scope and budget for their approval before proceeding with any additional improvement evaluations.

We have based this assumed level of improvement evaluation on our experience working with the City's hydraulic model and the initial evaluation of future growth prepared for the recent U of M housing project evaluation.

Examples of the known capacity bottlenecks under the preliminary master plan level flows are shown in Figure 2 and tabulated in Table 2. Locations marked with blue symbols indicate anticipated minor bottlenecks. Those with orange symbols indicate locations that may require a more in-depth analysis, and those indicated with purple symbols are major bottlenecks that could require a more extensive investigation with multiple options evaluated.

This figure is intended to indicate the number and types of known capacity issues that will need to be evaluated. The capacity issues identified in Figure 2 (*above*) and Table 2 (*following page*) are not exhaustive as the Comprehensive Land Use Plan is still being developed.

Table 2. Description of Sanitary Capacity Bottlenecks Shown in Figure 2 and the Anticipated Magnitude of Project Effort

#	Bottleneck	Projected Effort
1	Pittsfield Trunkline	Major
2	U of M Student Housing (local pipes)	Intermediate
3	Pioneer High School	Minor
4	Veterans Memorial Park	Intermediate
5	Liberty Miller	Intermediate
6	Virginia Park to Murray Court	Major
7	West Park to Chapin and Miller	Major
8	Lakewood	Minor
9	Riverside Park	Minor
10	Faye Dr	Minor
11	Unanticipated-Based on New Growth Estimates (up to 6)	Minor
12	Unanticipated-Based on New Growth Estimates (up to 2)	Intermediate
13	Unanticipated-Based on New Growth Estimates (1)	Major

Once the recommended system improvements to adequately convey existing and future flows are identified, OHM will evaluate the constructability of each recommended improvement and determine the anticipated means and methods for constructing the project. Some recommended improvement projects may require bypass pumping during construction to allow for the replacement of infrastructure. Projects requiring bypass pumping will be identified, and anticipated flow rates will be quantified for sizing the bypass pumping. As part of this effort, we will assess the constructability of each recommended improvement, identify which recommended improvements will require bypass pumping for construction, quantify the dry weather and wet weather flow rates under existing and future 10-year and 20-year growth conditions at locations with recommended improvements that require bypass pumping, estimate the length of bypass piping necessary for each recommended improvement requiring bypass pumping, develop a map of locations illustrating recommended improvements, tabulate bypass location details and develop associated planning-level cost estimates for bypassing to include in the cost estimates for improvements that require bypassing.

Specific work items under this task include the following:

- Identify recommended improvements to address minor and intermediate-level capacity bottlenecks.
- Identify up to three alternatives to address each major capacity bottleneck.
- Prepare conceptual-level cost estimates for each recommended improvement and alternative.
- Evaluate alternatives based on City-defined factors.
- Identify recommended alternatives.
- Develop conceptual engineering layouts for each recommended alternative.
- Evaluate constructability and bypass pumping.

Task 4.G – Delivery of Model Scenarios

OHM will work with the City to identify the preferred method of model scenario transfer. The models will be delivered with documentation identifying the model run file locations and parameters included in each scenario. Each scenario, including the dry weather flow scenarios, will include the Townships' flow contributions set at their contract maximum flows. The following scenarios will be included:

- Existing conditions – dry weather flow
- Existing conditions – EGLE 10-year recurrence interval design event
- Existing conditions – City 25-year recurrence interval design event
- 10-year growth conditions – dry weather flow
- 10-year growth conditions – EGLE 10-year recurrence interval design event
- 10-year growth conditions – City 25-year recurrence interval design event
- 20-year growth conditions – dry weather flow
- 20-year growth conditions – EGLE 10-year recurrence interval design event
- 20-year growth conditions – City 25-year recurrence interval design event

Task 4 Deliverables

In addition to providing a copy of the updated and calibrated hydraulic model as part of Task 4.G, OHM will also summarize the Task 4 efforts into **Volume 3: Hydraulic Analysis and Recommended Improvements** of the final report. A draft version of Volume 3 will be provided to the City for review, then the document will be finalized upon incorporation of the City's comments. One electronic and two hard copies of the finalized Volume 3 will be submitted to the City. Volume 3 will

include the following information:

- Map of locations with capacity constraints and recommended improvements under existing and future growth scenarios
- Tabulation of flow rates for each model scenario and flows associated with each recommended improvement
- Maps of locations at high risk of basement backups or SSOs under existing conditions and 10-year and 20-year growth projections
- Improvement alternatives to address capacity constraints under existing and future conditions.
- Conceptual layouts and cost estimates for recommended improvements
- Map of locations for bypass pumping
- Tabulation of bypass locations, flow rates, bypass piping lengths, and associated planning-level cost estimates

TASK 5: CAPACITY ASSESSMENT OF WASTEWATER FACILITIES

The City desires to understand how the current capacities of the Ann Arbor Wastewater Treatment Plant (WWTP) and lift stations compare to the observed dry and wet weather flows these facilities receive. The City also desires to understand whether the collection system and WWTP have the capacity to convey the Townships' contract maximum flows. OHM will evaluate the design capacities of the wastewater facilities and compare their design capacities to observed and projected dry and wet weather flows from the collection system and Townships to identify whether infrastructure improvements are necessary to accommodate current or future flows.

Task 5.A – Wastewater Treatment Plant and Lift Station Capacity Assessment

As part of this task, OHM will evaluate the capacity of the WWTP and lift stations to adequately convey, pump, and treat projected dry weather and peak wet weather flows under existing and future conditions. Specific work efforts include the following:

- Review the design capacities of the various wastewater treatment plant processes.
- Review the pump curves for the pumps at the WWTP and at the lift stations relevant for the SSCSCP study.
- Review the data from the available flow meters at the WWTP and at the lift stations.
- Evaluate the ability of the WWTP and lift stations to convey the projected dry weather and wet weather flows under existing and future 10-year and 20-year growth conditions utilizing the City's 25-year recurrence interval design event.
  - » This will be accomplished by comparing the tributary dry weather and wet weather flows to the design capacities of the WWTP processes and lift stations.
  - » A tabulation will be prepared that compares the projected peak flows to the available facility capacities. It is assumed that the capacities of these facilities are readily available and will be transmitted to the OHM project team and that the development of rated facility capacities will not be required for this study.
- Capacity deficiencies identified at lift stations will be addressed as part of the Future Growth Evaluation outlined in Task 4.
- For any capacity deficiencies identified in the WWTP, we will identify recommended next steps that the City should undertake to further investigate them. We will not be evaluating recommended improvements for the WWTP.

Task 5.B – Review of Existing Wastewater Service Agreements

Under this task, OHM will review existing wastewater service agreements between the City and Townships to evaluate whether the City's collection system and wastewater treatment plant have the capacity to convey the contract maximum flows from the Townships. The design capacities of the wastewater facilities will be compared with projected peak flows from the collection system and Townships to assess whether capacity improvements are needed to meet current and future growth needs. Opportunities to revise the Townships' existing wastewater service agreements and/or their contract maximum flow limits will also be identified.

Specific work efforts associated with this task include the following:

- Review existing wastewater service agreements between the City and Townships.
- Coordinate with each Township that sends

wastewater to the City's WWTP to collect their most recent Sanitary Sewer Master Plans and growth projections for review, if that information is available.
- Compare observed wet weather flow rates from the Townships to their contract maximum flow rates.
- Analyze whether the wastewater collection system and treatment plant and applicable lift stations have the capacity to adequately convey, pump, and treat the observed peak flow rates from the Townships, and whether they have remaining capacity to adequately convey, pump, and treat the contract maximum flow rates from the Townships.
- Calculate how much additional flow capacity remains at the wastewater treatment plant and lift stations to accommodate future growth or future wastewater service agreements.
- Provide suggested modifications to the Townships' existing wastewater service agreements and/or their contract maximum flow limits based on the data analysis performed.
- Provide suggested additional contract terms for the City's consideration to include in future wastewater service agreements.

Task 5 Deliverables

As part of this task, OHM will summarize the Task 5 efforts into **Volume 4: Capacity Assessment of Wastewater Facilities** of the final report. A draft version of Volume 4 will be provided to the City for review, then the document will be finalized upon incorporation of the City's comments. One electronic and two hard copies of the finalized Volume 4 will be submitted to the City. Volume 4 will include the following information:
- Summary of capacity evaluations of the wastewater treatment plant and lift stations to convey projected dry weather and wet weather flows under existing and future conditions
- Recommended actions to further investigate identified capacity deficiencies
- Tabulation of observed peak flow rates from Townships compared to their contract maximum flow rates
- Tabulation of observed peak flow rates at the wastewater treatment plant and lift stations compared to their design capacities
- Summary of remaining flow capacities at the wastewater treatment plant and lift stations to accommodate future growth or wastewater service agreements
- Suggested modifications to the wastewater service agreements

TASK 6: PHASING STRATEGY FOR IMPROVEMENTS

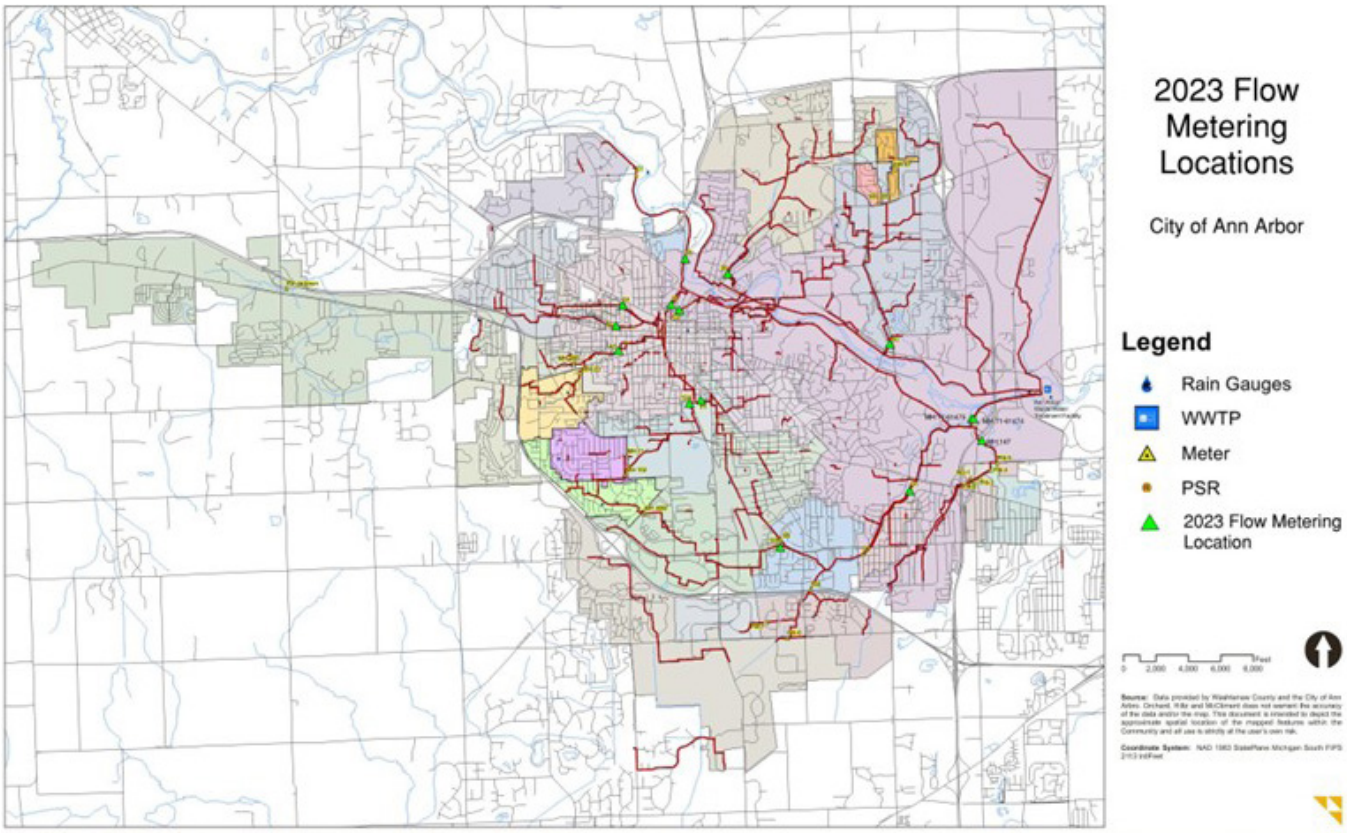
A phasing strategy will allow the City to prioritize, plan, and budget for needed improvements and will also allow for flexibility in planning based on how well actual future growth matches growth projections. The sanitary system phasing strategy will consider capacity constraints identified in Task 4: Hydraulic Analysis and Recommended Improvements.

Task 6.A – Develop Phasing Strategy

Under Task 6.A, OHM will work closely with the City to define system goals and prioritization strategies based on growth projections and the timing of when capacity constraints are expected to occur. With these goals in mind, OHM proposes to develop a phasing strategy that will prioritize improvements needed to adequately convey flows under existing or rapidly evolving conditions so the City can continue to meet EGLE regulatory requirements and the City's level of service expectations. The phasing strategy will then present recommended improvement priorities within the collection system so downstream improvements can be implemented in time to accommodate growth upstream. The phasing strategy will consider the following:
- The City's current Capital Improvement Plan (CIP).
- Existing capacity constraints not addressed by projects included within the current CIP.
- Projected capacity constraints with future growth.
- Recommended improvements under existing and future conditions as identified in Task 4.

Projects will be prioritized based on the timeline and severity of capacity constraints. High, medium and low priority projects will be identified to address capacity constraints under existing and future growth conditions under both EGLE and City design standards. The highest priority projects will be those that are needed to address all these scenarios. Medium and low priority projects will be identified from evaluating the project needs for combinations of the other scenarios. We will work with the City to identify the scenarios to be used for project prioritization.

Figure 3.
2023 Flow Monitoring Locations



Task 6.B – Develop a Flow Monitoring Plan

As part of the phasing strategy, a flow metering plan will be developed that is designed to monitor flows and growth within the City. The flow metering plan will define clear objectives such that it supports the City's data needs for monitoring system performance as changes and growth occur within the system. These needs could include tracking actual growth versus projected growth, assessing sewer conditions, verifying that infiltration and inflow rates are within the ranges used for the SSCSCP, and updating the hydraulic model.

Permanent flow monitoring will be recommended at strategic locations along major sewer interceptors and within priority sewersheds to provide long-term data to facilitate operational decisions and recommendations for improvements. Short-term flow metering will be recommended to evaluate the performance of infrastructure improvement projects, the flow contributions from significant new developments, or other City-defined goals. OHM will develop a map of proposed flow meter locations and supporting rationale for selection of each location. The 2023 flow monitoring plan developed to inform data collection for the SSCSCP is shown in Figure 3 as an example.

Specific work items in this task include the following:

- Identify City metering goals.
- Develop short- and long-term flow meter location recommendations and illustrate the locations on a map.

Task 6 Deliverables

As part of this task, OHM will summarize the Task 6 efforts into **Volume 5: Phasing Strategy for Improvements** of the final report. A draft version of Volume 5 will be provided to the City for review, then the document will be finalized upon incorporation of the City's comments. One electronic and two hard copies of the finalized Volume 5 will be submitted to the City. Volume 5 will include the following information:

- City-defined goals and prioritization strategies
- City's anticipated timing of growth projections
- Phasing strategy for recommended improvement projects under existing and future 10-year and 20-year growth conditions
- Map of locations with recommended improvements
- Short-term and long-term flow meter location recommendations

TASK 7 – INFOWORKS™ TRAINING

OHM's proficiency in InfoWorks™ and hydraulic modeling uniquely positions us to deliver a high-quality training experience to City staff. The training would be specifically crafted to accomplish the training goals of the individual City staff members participating in the training.

Task 7.A – InfoWorks™ Training and Training Materials

Upon completion of the model update, calibration, and hydraulic analysis efforts, OHM will develop a user manual specific to operation of the City's hydraulic model. The user manual will provide an overview of the City's hydraulic model and its scenarios as well as instructions on how to manipulate and make updates to the model for future use. OHM will also provide a reference sheet that lists various online resources available for City staff to access for as-needed assistance with the InfoWorks™ model platform and functionalities.

Additionally, two OHM staff members will provide up to two, 2-hour training workshops (either in person or virtual) for up to four (4) City staff members on how to utilize and run the model. Topics to be covered during the training sessions may include:

- Model button functionalities
- Mapping functionalities
- Overview of model scenarios
- Model inputs
- Analysis and interpretation of model results

Task 7 Deliverables

As part of this task, OHM will summarize the Task 7 efforts into **Volume 6: InfoWorks™ Training** of the final report. A draft version of Volume 6 will be provided to the City for review, then the document will be finalized upon incorporation of the City's comments. One electronic and two hard copies of the finalized Volume 6 will be submitted to the City. Volume 6 will include the following information:

- City of Ann Arbor Hydraulic Sanitary Sewer Model User Manual
- InfoWorks™ Hydraulic Modeling Resources Reference Sheet
- Summary of items reviewed during the two training sessions with City staff

TASK 8 – PUBLIC ENGAGEMENT

The City emphasizes transparency with its customers and prioritizes public engagement to enhance stakeholder comprehension and involvement in decision making. We are planning a modest public engagement effort for this study for several reasons. The City is not updating the level of service for the system as part of this effort. The design storm was developed through an extensive public engagement process in 2013–2015, and the outcomes from that process are still valid and serve the City well. The growth from the City's Comprehensive Land Use Plan, which includes a robust community engagement effort, is likely to drive the need for some significant improvements to the system. Until those improvements are understood at a master plan level, it is difficult to know the appropriate level of public engagement or where it should be conducted. Public engagement will be critical once more details are known about the recommended improvement projects. OHM's proposed Public Engagement strategy is detailed below.

Task 8.A – Public Engagement

Recognizing that information assessed and derived from this project may be considered sensitive, OHM's engagement strategy primarily focuses on educating the public on the importance and purpose of a sanitary sewer master plan. As part of this SSCSCP development, we will utilize the City's public engagement toolkit and will develop a recommendation for a public engagement plan for each component of the SSCSCP. This will allow public engagement to be performed in the future that is focused on the needs of each improvement identified

OHM's public engagement strategy primarily focuses on educating the public on the importance and purpose of a sanitary sewer master plan.

from the SSCSCP. OHM will coordinate with the City to develop digital and social media materials that effectively communicate the project's process, outcomes, and impacts to interested stakeholders and residents.

Key efforts as part of this public engagement strategy will include:

- Complete the City's Community Engagement Toolkit with City staff.
- Create a target audience list, which may include stakeholders, City staff, and media.
- Develop a message model – identify the messages that should be communicated to engage stakeholders and introduce the project team's competencies and project merits.
- Develop digital media – coordinate with the City to develop a project website that will provide a summary of the project and will include educational materials, periodic project updates, dashboards, and a project video.
- Produce one (1) project video that provides a high-level overview of the project and its findings and recommendations.
- Develop and assist with up to three (3) presentations to City Council and/or City Commissions.
- Prepare a recommendation for future public engagement activities to be performed for each improvement identified in the SSCSCP.

Task 8 Deliverables

As part of this task, OHM will summarize the Task 8 efforts into **Volume 7: Public Engagement** of the final report. A draft version of Volume 7 will be provided to the City for review, then the document will be finalized upon incorporation of the City's comments. One electronic and two hard copies of the finalized Volume 7 will be submitted to the City. Volume 7 will include the following information:

- Completed Community Engagement Toolkit
- Target Audience List
- Message Model
- Digital Media
- Project Video
- City Council Presentation Materials
- Summary of public engagement efforts

TASK 9 – POLICY AND FINANCIAL EVALUATION

Our team understands that the City is interested in a review of the 2015 Capital Cost Recovery Charge Report and its continued policy use as the City implements its SSCSCP. We also understand the City is not looking for a sewer rate study at this point, but rather development of alternative policy and financial evaluations so that the cost of new development and potentially needed sewer capacity is fairly and reasonably borne by existing customers, developers, and new customers both now and in the future. Stantec Consulting Services (Stantec), as a sub-consultant to OHM, will lead the policy and evaluation efforts.

The City is currently in the process of updating the Comprehensive Land Use Plan that is expected to reflect additional densification and growth within the City. It is anticipated that this growth will drive the need for significant capital improvements to the sanitary sewer collection system. The City desires policy and financial tools to support new development infrastructure needs that are both equitable to existing and future customers and maintains a high level of service. Some of the policy concepts that need to be explored as part of the evaluation include:

- **Growth pays for growth** – The cost for upgrading the sewer system to handle new development should be borne by the development and not the existing rate payers.
- **Equitable cost sharing** – The cost for upgrading the sewer system should be borne by those who will benefit from the upgrades, not just the first development that overloads the sewer.
- **Consistent and fair treatment** – Development across the City must be treated in a consistent and

fair manner regarding the City's policy for funding required upgrades to the sewer system.
- **Comply with financial and legal requirements** – The City's policy must be defensible and comply with financial objectives.

As part of this effort, we will provide examples of policies and case studies from other communities describing how they plan for growth and finance system expansion. We will also assist with evaluation of different funding sources for this new investment and assist the City in communicating these important policy matters to impacted stakeholders. The Stantec team will complete five major tasks to complete the analysis.

Task 9.A – Project Initiation / Management & Data Collection

- **9.A.1** – Prepare initial data request list and detailed critical path schedule. Perform job set-up activities.
- **9.A.2** – Prepare for and facilitate kick-off conference call with City and OHM to discuss study scope, approach, and key project milestones.
- **9.A.3** – Compile and review historical, current, and other system data as provided by staff.
- **9.A.4** – Prepare for and participate in 6 project management calls, providing status updates and supporting materials as required.
- **9.A.5** – Prepare for and participate in 2 stakeholder working group meetings to present initial and final results of policy and funding option analysis.

Task 9.B – Review of Existing Capital Cost Recovery Model and DOM

- **9.B.1** – Review and evaluate the effectiveness of the City's current Capital Cost Recovery model in the context of future use with the SSCSCP Implementation and current City objectives.
- **9.B.2** – Review and evaluate the effectiveness of the City's existing Developer Offset Mitigation (DOM) Program in the context of continued use with the SSCSCP Implementation and current City objectives.
- **9.B.3** – Provide recommendations to continue the current DOM program/create sustainable alternatives for homeowners to disconnect footing drains
- **9.B.4** – Prepare for and conduct an interactive virtual call with City staff and OHM to review initial findings and obtain City feedback and direction
- **9.B.5** – Modify initial findings and recommendations based upon input from City staff and OHM.
- **9.B.6** – Finalize findings and recommendations through a second interactive virtual call with City staff and OHM.

Task 9.C – Research / Develop Policy Options & Funding Strategies to Implement SSCSCP

- **9.C.1** – Research and provide examples of pertinent policies from similar communities planning/paying for system growth and expansion.
- **9.C.2** – Review examples discussed in Task 9.C.1 for any conflict with regulatory concerns, rate payer fees, and fees paying for growth
- **9.C.3** – Prepare for and conduct third virtual interactive call with City staff and OHM regarding findings in Tasks 9.C.1 and 9.C.2.
- **9.C.4** – Modify findings based on comments and discussion in Task 9.C.3 and again review with the parties through a virtual interactive call.
- **9.C.5** – Finalize policy and funding evaluations reflecting comments received in Task 9.C.4.

Task 9.D – Presentations and Report

- **9.D.1** – Develop and virtually present a summary of analysis to City Administration explaining recommendations, tradeoffs and selection of options.
- **9.D.2** – Modify recommendations for input received and finalize recommendations.
- **9.D.3** – Revise presentation for discussions with City Council and other stakeholders regarding findings and recommendations of Stantec's analysis.
- **9.D.4** – Prepare for and attend 3 public meetings to present policy and funding analysis options and findings/recommendations (interim and final).
- **9.D.5** – Develop a one-page summary of identified options and funding strategies and provide to City.

Task 9 Deliverables

As part of this task, OHM and Stantec will summarize the Task 9 efforts into **Volume 8: Policy and Financial**

Evaluation of the final report. A draft version of Volume 8 will be provided to the City for review, then the document will be finalized upon incorporation of the City's comments. One electronic and two hard copies of the finalized Volume 8 will be submitted to the City. Volume 8 will include the following information:

- Case studies from other communities
- Recommendations regarding current Cost Recovery Model and DOM program
- Recommendations for funding policy(ies)

Optional Tasks

As-Needed Modeling Support

Additional as-needed services are included to address items that may arise during the project that were not anticipated during this scope development. These may include:

1. Addressing short-term development pressures with as-needed modeling and analysis support to evaluate the sanitary sewer impacts of new developments quickly when they arise. The City may desire to have more extensive development analysis efforts performed via an escrow account paid by the developer, but this as-needed allowance will enable the City to perform quick, initial evaluations of new developments as they arise, if desired, helping to alleviate the schedule pressures.
2. Evaluate additional improvement projects if more extensive improvements are needed than assumed in this scope.
3. Evaluate infrastructure optimization challenges such as redesigning the flow split at the First and Miller diversion structure.
4. Perform other additional modeling tasks presented by unforeseen emerging issues.
5. Perform additional public engagement focused on more specific improvement options and locations once the recommendations are better understood for the SSCSCP.
6. Other items that may arise as requested by the City.

The budget allowance for this task will not be used without advanced authorization from the City, and we will prepare a scope and a budget for each item for approval by the City before proceeding with any work under this task. This work would be completed under OHM's rate schedule for the year that the as-needed work is performed. This rate schedule is updated each year to reflect current market and economic conditions, and we will share this rate schedule with the City as the scope and fee is developed for any as-needed tasks desired.

Assumptions

This scope of work was developed with the following assumptions:

- The City's GIS is updated and accurate and no updates are necessary by OHM.
- The City can provide OHM with SCADA access and available flow meter data, design drawings, pump curves, wastewater service agreements with Townships, and design capacities of the wastewater treatment components upon request.

Schedule

Development pressure is straining the sanitary sewer system now, which brings schedule pressures to bear for this study. However, it is important not to rush a sanitary sewer master plan that will serve as the City's road map for decades to come. For this reason, we have developed a project schedule that is designed to allow for sufficient time to develop a high quality SSCSCP that is technically sound and carefully reviewed, understood, and approved by the City.

Assuming City Council authorization in September 2024 and contract execution in October 2024, OHM is prepared to begin the Project Initiation and Information Gathering task beginning in October 2024. OHM proposes to submit the final deliverable to the City by February 2026 assuming timely responses and participation from connected stakeholders. A more detailed schedule highlighting project milestones is summarized below.

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Staff Resources By Task

STAFF HOURS

STAFF NAME PROJECT ROLE (BILLING CLASS)	R. Czachorski PIC (Principal)	M. Chamberlain PM (GE III)	K. Danielsen Modeling (Specialist III)	Various Modeling (GE II)	C. Elenbaas Costs / Design (PE IV)	M. Cummings Municipal Support (GE II)	E. Morgan AMM Development (GE IV)	M. Ulasir Visioning (Principal)	M. Trzeciak GIS Support (GIS Support)	D. Pulver Admin Support (Admin)	C. Slotten QA/QC Engineer (PE IV)	A. Burnham Financials & Policy (Director)	C. Malesky Financials & Policy (Technical Lead)	J. Bearman Financials & Policy (PM)	K. Cook Financials & Policy (Sr. Consultant)	A Ruiz Design & Costs (Sr Consultant)	Various Financial Analysts (Analyst)	Lambert Admin Support (Admin)	Fees - Stantec	Fees - H2O Metrics	TOTALS
TOTAL HOURS	**320**	**815**	**907**	**564**	**295**	**353**	**126**	**46**	**39**	**34**	**81**	**50**	**35**	**75**	**60**	**94**	**45**	**10**	**1**	**15**	**3965**
TASKS																					
TASK 1: PROJECT INITIATION AND INFORMATION GATHERING																					
TASK 1 HOURS SUMMARY	8	51	60	30	20	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	185
TASK 2: FLOW METERING DATA ANALYSIS AND INFLOW AND INFILTRATION EVALUATION																					
TASK 2 HOURS SUMMARY	43	73	131	210	12	8	28	0	0	5	0	0	0	0	0	0	0	0	0	15	525
TASK 3: HYDRAULIC MODEL UPDATE AND CALIBRATION																					
TASK 3 HOURS SUMMARY	35	71	142	137	10	0	98	10	0	3	0	0	0	0	0	0	0	0	0	0	506
TASK 4: HYDRAULIC ANALYSIS AND RECOMMENDED IMPROVEMENTS																					
TASK 4 HOURS SUMMARY	121	221	394	129	221	329	0	20	9	10	40	0	0	0	0	94	0	0	0	0	1588
TASK 5: CAPACITY ASSESSMENT OF WASTEWATER FACILITIES																					
TASK 5 HOURS SUMMARY	25	134	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	199
Task 6: PHASING STRATEGY FOR IMPROVEMENTS																					
TASK 6HOURS SUMMARY	22	55	71	16	28	0	0	0	0	5	20	0	0	0	0	0	0	0	0	0	217
TASK 7: INFOWORKS TRAINING																					
TASK 7 HOURS SUMMARY	18	73	77	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	171
TASK 8: PUBLIC ENGAGEMENT																					
TASK 8 HOURS SUMMARY	30	112	32	2	2	0	0	4	30	2	0	0	0	0	0	0	0	0	0	0	214
TASK 9: POLICY AND FINANCIAL EVALUATION																					
TASK 9 HOURS SUMMARY	18	25	0	0	2	0	0	12	0	6	21	50	35	75	60	0	45	10	1	0	360
OPTIONAL TASKS (Hours not included in totals above.)																					
As-Needed Modeling Support	25	60	180																		265

Project Timeline

FROM START TO FINISH

PHASES & TASKS	2024 S	O	N	D	2025 J	F	M	A	M	J	J	A	S	O	N	D	2026 J	F
EXECUTED CONTRACT																		
TASK 1: PROJECT INITIATION AND INFORMATION GATHERING																		
TASK 2: FLOW METERING DATA ANALYSIS AND INFLOW & INFILTRATION EVALUATION																		
TASK 3: HYDRAULIC MODEL UPDATE AND CALIBRATION																		
TASK 4: HYDRAULIC ANALYSIS AND RECOMMENDED IMPROVEMENTS																		
TASK 5: CAPACITY ASSESSMENT OF WASTEWATER FACILITIES																		
TASK 6: PHASING STRATEGY FOR IMPROVEMENTS																		
TASK 7: INFOWORKS TRAINING																		
TASK 8: PUBLIC ENGAGEMENT																		
TASK 9: POLICY AND FINANCIAL EVALUATION																		
OPTIONAL TASKS																		
As-Needed Modeling Support																		