

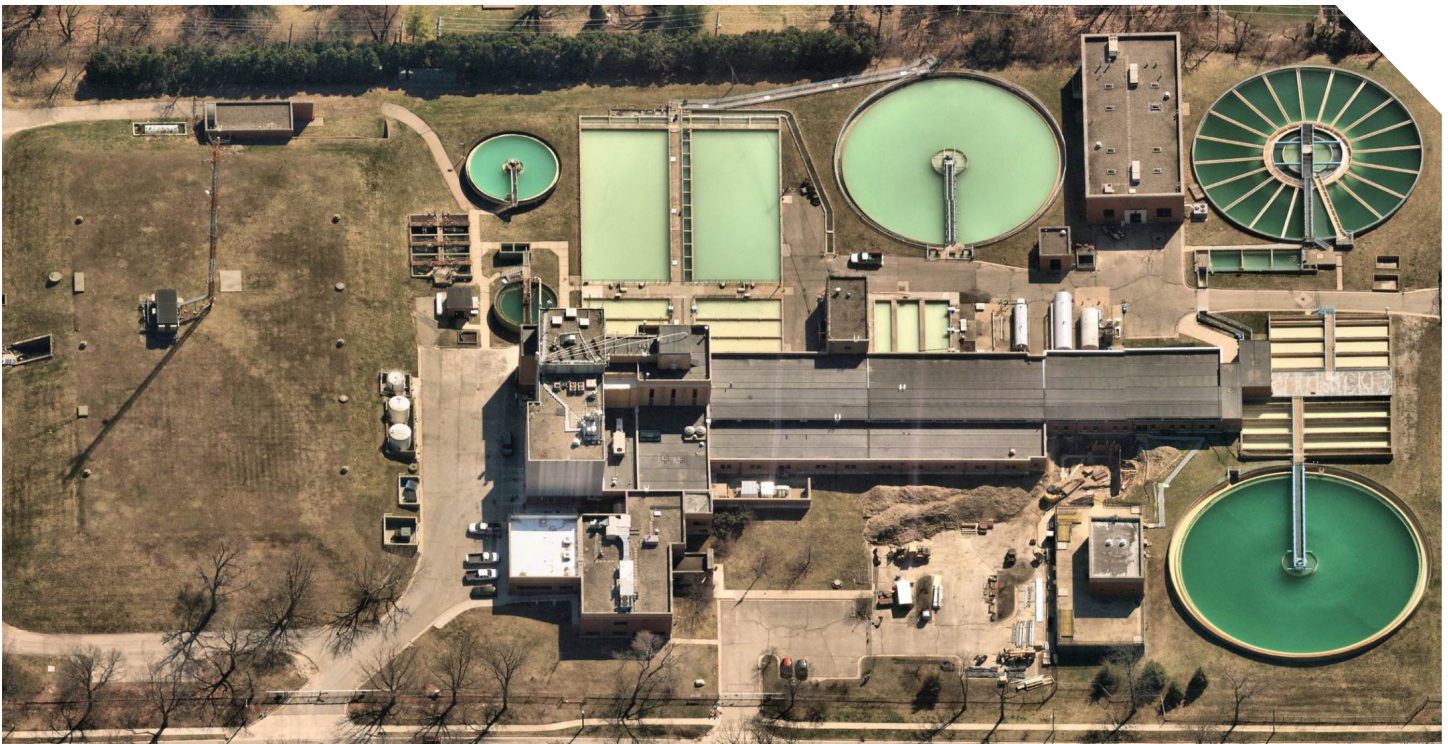
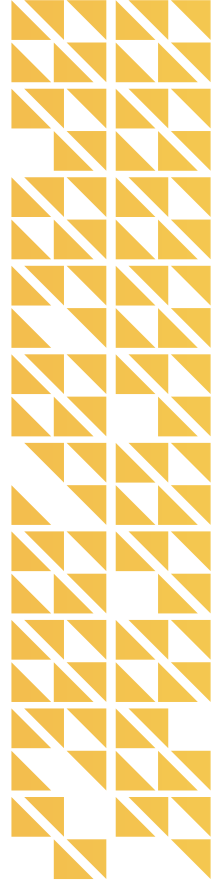


Request for Proposal (RFP) # 23-57

Water Distribution Plan & Model Update

City of Ann Arbor, Michigan

Proposal Deadline Wednesday, November 1, 2023



Our Expertise

We are a multi-office team of 650+ from different backgrounds, striving to use our combined expertise and talents to continually advance the communities we serve.



Cover Letter

DEAR MR. BAUGHMAN,

We are pleased to submit this proposal to the City of Ann Arbor (City) for a Water Distribution Plan & Model Update and acknowledge receipt of Addendum No. 1. OHM Advisors is inspired to deliver a level of service on this project that aligns with the City's commitment to excellence in serving their customers. We recognize the importance of this project, especially as the City continues to grow, key staff members continue to retire, and system assets continue to age. Our distinctive advantage lies in our technical expertise coupled with a deep understanding of the City's internal workings and challenges. Having the capability to view the project from a fresh perspective, our key team members are energized to provide creative and innovative approaches throughout this project. Key elements of our team's overall approach include:

Institutional Knowledge – The OHM Advisors team brings extensive background with the City's water distribution system and the multiple service units that strive to serve the community with reliable drinking water. From the intake at Barton Dam, to the meters that serve each customer, our staff have knowledge of service unit practices and the distribution system that cannot be matched by other consultants.

Experienced Staff – We have assembled a strong team with experience on City projects, so the City can be comfortable that we can deliver as proven in the past. Robert Czachorski will serve as the project manager and brings a history of successful City modeling and planning efforts. Susan Knepper will be the technical lead for the project and has performed dozens of modeling analyses for communities of all sizes and system complexities.

Technical Delivery – OHM Advisors aims to produce a comprehensive water distribution plan that not only satisfies regulatory and internal requirements but also captures the nuances of the City's water distribution system that you only learn from diving deep into system operations. OHM Advisors has provided an innovative approach to capture this information to assist in succession planning through an optional dashboard style deliverable, which will enable easy access to critical information about the water distribution system.

From beginning to end, our team is committed to providing consistent, high-quality results that match the level of thoughtfulness you seek. Please do not hesitate to contact me with any questions at (734) 466-4439 or george.tsakoff@ohm-advisors.com. We are excited for the opportunity to assist the City with this important project!



George A. Tsakoff, PE
Principal, OHM Advisors

Table of Contents

Section A: Professional Qualifications	4
A.1 Firm Overview	5
A.2 Key Personnel Summary	7
A.3 Team Organization Chart	8
A.4 Key Personnel Resumes	9
Section B: Professional Qualifications	21
B.1 Similar Work in the Area	23
B.2 Recent Work with the City	31
Section C: Proposed Work Plan	33
Section D: Fee Proposal (Separate)	—
Section E: Authorized Negotiator	71
Section F: Required Forms & Attachments	74
F.1 Legal Status Offerer (B)	75
F.2 City of Ann Arbor Declaration of Compliance (C)	76
F.3 Living Wage Ordinance Declaration of Compliance (D)	77
F.4 Conflict of Interest Disclosure Form (E)	78
F.5 W-9	79



SECTION A

Professional Qualifications



Firm Overview

WHO WE ARE

OHM Advisors was established in 1962 and has been growing steadily ever since. As a multidisciplinary organization of 650+ people from different backgrounds in eighteen (18) different cities across Michigan, Ohio, Indiana, Kentucky and Tennessee, striving to use our combined expertise and talents to continually advance the communities we serve.

Contract Office 34000 Plymouth Road, Livonia, MI 48150

FULL LEGAL NAME	Orchard, Hiltz & Mcliment, Inc.
FEDERAL EMPLOYER ID NO.	38-1691323
TYPE OF ENTITY	Corporation
STATE OF INCORPORATION	Michigan
AUTHORIZED NEGOTIATOR	George Tsakoff, PE



FOR MORE THAN 50 YEARS, WE
 HAVE HELPED COMMUNITIES
 AND BUSINESSES MANAGE
 THEIR WATER AND
 WASTEWATER NEEDS,
 PROTECT THEIR NATURAL
 WATER RESOURCES
 AND SURROUNDING
 ENVIRONMENTS, AND
 PLAN FOR THE FUTURE.



10 DISCIPLINES

18 OFFICES | 650+ EXPERTS OF DIVERSE BACKGROUNDS & TALENTS

OUR EXPERTISE & DISCIPLINES

ARCHITECTURE	35
CONSTRUCTION ENGINEERING	156
GEOGRAPHIC INFORMATION SYSTEMS	11
LANDSCAPE ARCHITECTURE & URBAN DESIGN	20
MECHANICAL, ELECTRICAL & PLUMBING ENGINEERING	13
MUNICIPAL ENGINEERING	168
PLANNING	22
SURVEYING	44
TRANSPORTATION	59
WATER & ECOLOGICAL ENVIRONMENTAL	56
SUPPORT SERVICES	85

Visit www.ohm-advisors.com for an in-depth look at our sub-discipline services.



Key Personnel Summary

PERSONNEL ROSTER

Personnel & Project Role	Location
George Tsakoff, PE, Principal	Livonia, MI
Robert Czachorski, PE, Project Manager	Livonia, MI
Susan Knepper, PE, Drinking Water Lead	Livonia, MI
Murat Ulasir, PhD, PE, Asset Management Engineer	Livonia, MI
Isabelle Bester, EIT, Asset Mgmt. & Water Modeling Engineer	Livonia, MI
Seth Swanson, PE, Water Hyrdaulics, QA/QC	Livonia, MI
Mackenzie Johnson, EIT, Lead Water Modeling Engineer	Livonia, MI
Christine Spitzley, AICP, Water Resources & Environ. Planner	Livonia, MI
Chris Elenbaas, PE, Distribution Planning	Ann Arbor, MI
Matt Kennedy, PE, Facilities Planning	Livonia, MI
Kayla McRobb, Hydrant Testing	Livonia, MI



Team Organization Chart

YOUR PROJECT TEAM

City of Ann Arbor

Principal

George Tsakoff, PE

SEE PAGE 72

E: susan.knepper@ohm-advisors.com

P: (734) 466-4458



Susan Knepper, PE

Drinking Water Lead & Assistant Project Manager



Robert Czachorski, PE

Project Manager

E: robert.czachorski@ohm-advisors.com

P: (734) 466-4548

*NON-KEY PERSONNEL – NO RESUME INCLUDED

Capital Planning

Chris Elenbaas, PE

Distribution Planner

Matt Kennedy, PE

Facilities Planner

Public Engagement

Christine Spitzley, AICP

Water Resources & Environmental Planner

Drinking Water Engineering

Seth Swanson, PE

Water Hydraulics, QA/QC

Mackenzie Johnson, EIT

Water Modeling Engineer

Isabelle Bester, EIT

Lead Water Modeling Engineer

Asset Management

Murat Ulasir, PhD, PE

Asset Management Practice Lead

Isabelle Bester, EIT

Asset Management Engineer



Robert Czachorski, PE

PROJECT MANAGER

Robert Czachorski has 25 years of experience in consulting with a focus on water resources and a deep expertise in sewer collection systems. Robert is the firm's Practice Leader for Collection Systems and is a nationally recognized expert in wet weather sewer issues.

As a Project Manager, Robert routinely delivers successful projects to our clients with high levels of quality and client satisfaction. He accomplishes this through a unique combination of strong technical capabilities, excellent communication skills, and team building that includes the client, consultants, and public.

Education

Master of Science in Hydraulics in Civil Engineering,
University of Michigan (1996)

Bachelor of Science in Civil Engineering,
University of Michigan (1994)

Professional Registrations

Professional Engineer
Michigan, #43827 (1998)

Extensive Collection Systems Experience

Performed studies for an extremely broad array of clients and projects, including some of the largest and most complicated sewer collection systems in the Country.

- Smart Technology & Water Quality
Leads a team at OHM Advisors focused on smart systems and water quality that won the Cleveland Water Alliance's Internet of H2O challenge in October of 2017 focused on tackling harmful algal bloom on Lake Erie.
- H2Ometrics Data Analytics Platform
Developed cloud-based water and sewer data analytics platform that manages flow and rain data from dozens of systems, comprising thousands of data feeds and billions of data points.
- The Antecedent Moisture Model
Developed a hydrologic model for antecedent moisture impacts on sewer systems. The model has been applied to hundreds of sewersheds and has optimized wet weather upgrades for dozens of systems. The approach resulted in a 2001 Award from the Water Environment Federation and a 2007 award from the American Council of Engineering Companies.

Robert has performed studies for nearly 100 municipal utility systems. He has helped these communities gain a better understanding of their systems, improve system performance, and optimize capital upgrades. He is one of the firm's top Principals and Project Managers. He is the Principal-in-Charge of some of the firm's largest accounts, including Ann Arbor, Oakland County Water Resources Commissioner, Macomb County Public Works, Delta Township, and the City of Los Angeles, CA.

Sanitary Sewer Capacity Evaluation;

City of Ann Arbor & University of Michigan (Ann Arbor, MI)

Project Manager for the study and conceptual engineering for providing sanitary sewer service to a new 5,000-person dorm on the University of Michigan campus. The proposed dorm discharges to a trunk sewer without sufficient capacity that traverses downtown Ann Arbor. The project involved working closely with the City to perform modeling, conceptual engineering and cost estimates to identify feasible routes to provide sewer service to the first freshmen dorm to be constructed on central campus since the 60's.



**Flooding Study from June 2021 Storm;
City of Ann Arbor (Ann Arbor, MI)**

Project Manager for the study of the flooding study and improvement planning for the 100-year storm that resulted in basement backups in the City. Project area focused on the Pittsfield Village neighborhood and surrounding areas to understand the cause of the basement backups and the recommend improvements to reduce the impacts from future large storms.

**Sanitary Sewer Improvements
& Preliminary Engineering Project;
City of Ann Arbor (Ann Arbor, MI)**

Project Manager; Sanitary Sewer Wet Weather Evaluation Project (SSWWEPE), performed by OHM Advisors between 2013 and 2016, provided the basis for the City's long-term planning and improvements for the sanitary sewer system. Robert was the Project Manager for the Sanitary Sewer Improvements & Preliminary Engineering (SSIPE) project, which involved performing flow metering, sewer investigations, modeling and preliminary engineering for improvements to several interceptor sewers in the city. The study focused on six interceptor areas that were identified in the SSWWEPE. The SSIPE project involved development of preliminary engineering designs and cost estimates for the six interceptor areas.

**CSO Long-Term Corrective Action Plan;
Great Lakes Water Authority (GLWA) (Detroit, MI)**

Project Manager; OHM Advisors was a sub-consultant on the LimnoTech team for development of the CSO Long Term Control Plan (LTCP) for this regional wastewater system serving four million people. Robert was the Project Manager for OHM Advisors' tasks, which included leading the design standards and level of service development, alternatives evaluation, conceptual engineering, and stakeholder engagement for alternatives. OHM Advisors also assisted with hydraulic modeling, water quality modeling and system optimization tasks.

**Sanitary Sewer Wet Weather Evaluation Project;
City of Ann Arbor (Ann Arbor, MI)**

Project Manager; Project manager and lead technical public engagement engineer for the City's evaluation of their sanitary collection system. The City of Ann Arbor performed approximately 2,700 footing drains disconnections (FDDs) from their sanitary sewer system between 2001 and 2012. The City retained OHM Advisors to perform an evaluation of the effectiveness of the FDD program and develop alternatives for improving the sanitary system. OHM Advisors approach included flow metering, FDD effectiveness evaluation, hydrologic modeling, hydraulic modeling, capacity assessment, alternative evaluation and an extensive public engagement program.



A.4 Key Personnel Resumes



Susan Knepper, PE

DRINKING WATER LEAD &
ASSISTANT PROJECT MANAGER

Education

Bachelor of Science in
Environmental Engineering,
University of Florida (2013)

Professional Registrations

Professional Engineer
Michigan, #65127 (2017)

Professional Accolades

American Water Works Association,
Michigan Chapter,
Young Professional of the Year (2021)

Susan Knepper is an environmental engineer in the Environmental and Water Resources Group at OHM Advisors (OHM). Her water resources experience includes hydraulic modeling, hydraulic calculations, water system optimization studies, water system master planning, asset management, condition assessment, site plan reviews and design, contingency and emergency response planning, and CIP planning of water systems. Susan is skilled in various computer programs including ArcGIS Pro, InfoWater Pro, InfoSurge, MS Excel, AutoCAD, and Brightly Predictor. Susan is an OHM QA/QC person for their water reliability study (WRS) projects and is very familiar with the water systems and operations of numerous communities throughout Michigan. She is the operational and technical engineer for the North Oakland County Water Authority (NOCWA), which involves emergency planning with the use of hydraulic modeling.

Susan is heavily involved in AWWA and with over a decade of experience, her contributions have led to the advancement of drinking water knowledge in Michigan and beyond. Susan has been a featured speaker at numerous local events throughout Michigan and has had the privilege of presenting at three international conferences, each dedicated to the vital subject of drinking water. Susan enjoys understanding the client's unique needs and point of view and offering innovative recommendations and solutions.

RELEVANT EXPERIENCE

Emergency Enhanced Emergency Response Plan; City of Livonia (Livonia, MI)

Susan was instrumental in developing the City's Emergency Response Plan dashboard, which represented a pioneering advancement within the industry. By Understanding the City's most significant concerns and identifying areas of improvement, she developed a dynamic tool that guides City operators and staff through numerous failure or service disruption scenarios. Susan evaluated each identified scenario within InfoWater Pro in order to provide step-by-step guidance to the City. With this tool, the City is able to capture institutional knowledge and gain insights into how certain failure and service disruption scenarios will impact their customers, ultimately leading to a better understanding of the factors that may result in boil water advisories.



Stormwater & Wastewater Asset Management Plan; City of Ann Arbor (Ann Arbor,MI)

Project Engineer; Susan served as the primary engineer and was extensively involved with assisting the City in developing their Assetic/Brightly Predictor Model, which helps a community with predicting system degradation and long-term investment needs, and setting up their Assetic Register dashboard, which acts as a hub for asset data. Met with the City on a bi-weekly basis to develop a base model and help make technical decisions about their model. Performed data analysis on the City's condition data to determine best inputs into the model. Developed the current model with the help of the City based on asset information, technical analysis, and institutional knowledge to produce a realistic and reliable model. Imported the City's sanitary and stormwater sewer mains into their Assetic Register.

Water Master Plan Update; Canton Township (Canton Township, MI)

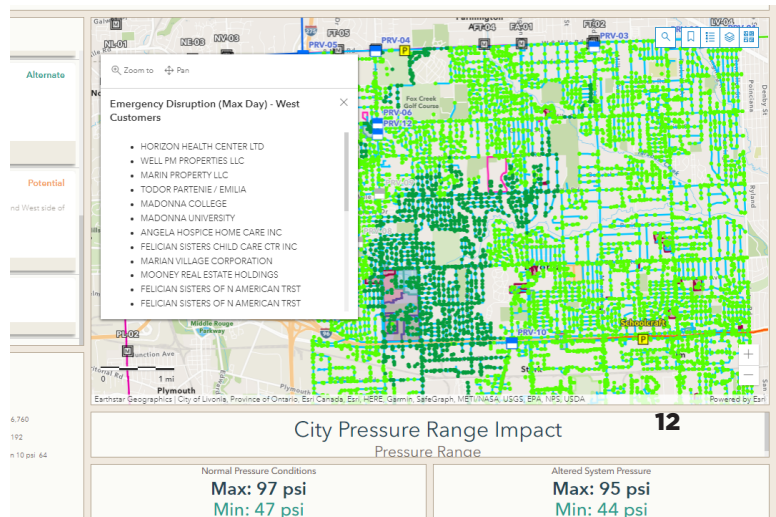
Susan is serving as the technical lead on this project, overseeing and mentoring graduate engineers to ensure successful execution of each project phase. Susan's extensive experience includes serving as the lead engineer during the Township's 2018 update. The project includes updating the Townships existing water model with new watermains and updated demands. Hydrant flow testing guidance, model calibration, hydraulic analysis, asset management planning, and capital planning.

Canton Township, Orion Township, City of Auburn Hills, City of Livonia, LCWA General Engineering Services (Various Communities, MI)

Drinking Water Engineer: Collaborates closely with each community to address a spectrum of water system challenges, including, but not limited to, pressure, fire protection, operations, and design. Susan possesses a deep understanding of each client's distinct water system operations, serving as their trusted advisor. She has helped each one of these communities complete their Water Master Plans and assists the communities in completion of Act 399 Permits - Basis of Design via their InfoWater Pro calibrated models.

2021 Combined Water Reliability Study, General Plan, & Asset Management Plan Update; City of Auburn Hills Auburn Hills, MI)

Susan served as the primary engineer and technical lead for Auburn Hill's Water Master Plan Update, which included demand and planning projections, model updates, hydraulic analysis, asset management, capital planning, and a final report deliverable. The model update included extended state calibration of their model to ensure accurate representation of system pressures and storage tank levels throughout a 72-hour demand scenario. Modeling was completed in InfoWater Pro. Pressure loggers were utilized in the field to record system pressures and this data was used to calibrate the City's model. The City can now use their model with a high degree of confidence to assess the impact of their operational decisions or chances to their operations.





Chris Elenbaas, PE

DISTRIBUTION PLANNING

Chris serves as a Senior Project Manager and has over 18 years of broad experience within municipal engineering, including master planning, engineering analysis, asset management, condition assessment, detailed design, and construction administration. His primary focus has been within municipal water supply including storage tanks, pump stations, distribution mains, and large diameter transmission mains. Beyond water infrastructure, he has served as a design engineer for wastewater gravity mains, force mains, lift stations, pedestrian pathways, roadways, streetscapes, and recreational facilities.

Beyond his consulting experience, he has over four years working within a public works environment and is accustomed to field and emergency response efforts.

Education

Bachelor of Science in Civil & Environmental Engineering,
University of Michigan (2005)

Professional Registrations

Professional Engineer
Michigan, #6201056730 (2009)

Temporary Pump Station; City of Farmington Hills (Farmington Hills, MI)

Project Manager; OHM led the efforts to design a temporary water pump station that reversed normal flow patterns and allowed the City of Farmington Hills to supply water from one of their alternate feeds during the rehabilitation of a 48-inch and 54-inch transmission main. Services included emergency design, hydraulic analysis, permit and startup assistance for a 3,200 gpm temporary water booster station. Challenges included pump availability, permitting requirements, cold weather installation and surge management.

7 Mile Road Water Tower & Vault Modifications, Charter Township of Northville (Northville, MI)

Project Manager; OHM provided planning, detailed design documents and construction phase services for the construction of a new 0.5 million gallon (MG) elevated water storage tank and flow control vault improvements within the Charter Township of Northville water distribution system. The elevated water tank was designed to provide storage to reduce the Township's overall peak hour water demand rate and will allow them to become a maximum day demand customer with the Great Lakes Water Authority (GLWA). Valve vault improvements to control flows to the new elevated tank were constructed at two GLWA-owned meter pits located along 8 Mile Road.

Barton Pump Station Valve Improvement Project; City of Ann Arbor (Ann Arbor, MI)*

Project Engineer; Designed and reviewed valve and process piping improvements at the City of Ann Arbor Barton Pump Station, which supplies approximately 85% of the City's raw water from the Huron River to the City's Water Treatment Plant. Included a detailed sequence of work to minimize disruption of flow from the 40 MGD pump station into the WTP. Internal and external gate and butterfly valve replacements ranged from 8" up to 42" inch. The project also included replacement of a 36" x 72" sluice gate on the City's Barton Dam, which serves as primary isolation for the City's largest intake into the Huron River.

Raw Water Main Condition Assessment; City of Ann Arbor (Ann Arbor, MI)*

Project Manager; Led the condition assessment of the City's primary raw water mains from the Huron River to the City of Ann Arbor's Water Treatment Plant. The project included the internal and external evaluation of one mile of 24-inch cast/ductile iron transmission main and one mile of 42-inch prestressed concrete cylinder pipe (PCCP).



Underground Storage Reservoir Feasibility Study; Northville (Northville, MI)

Project Manager; In response to a consent order from EGLE, OHM prepared a comprehensive feasibility study to address an aging underground 450,000 gallon reservoir in the City of Northville.. The feasibility study included review of previous planning documentation, confirmation of existing water distribution system configuration, modeling analysis, and a planning level evaluation of options for repair, replacement or removal, and cost estimates for the recommendations. Utilizing available SCADA data, OHM Advisors interpolated flows from the existing elevated storage tank to develop demands and diurnal patterns. The study recommended abandonment of the reservoir and the installation of a new booster pump station.

2023 Miscellaneous Utility Projects Design; City of Ann Arbor (Ann Arbor, MI)

Assistant Project Manager; Engineering design for water main replacement and road resurfacing for four local streets - Carmel Street, Easy Street, Provincial Drive, and Glendaloch Road, including determination of horizontal alignment and construction methodology for the water main replacements, road cross-sectional requirements, and storm system needs. The design also included replacement of a nearby sanitary sewer on Arlington Boulevard, and abandonment of an old crosslot sanitary sewer on North Seventh Street that required the relocation of a single remaining service lead from the sewer to be abandoned to the sanitary sewer in the roadway.

5 Mile & Ridge Road Water Main Extension (Northville, MI)

Project Manager; Developed design documents and managed construction services for the installation of 8,800 feet of new 16-inch HDPE water main. The new water main was primarily installed by horizontal directional drill (HDD) to minimize environmental impacts to sensitive wetlands and a major stream crossing along the proposed route. Included extensive stakeholder coordination including a CSX Railroad crossing, high pressure gas main crossing, stream crossing and extensive wetlands.

As-needed Engineering; Task 1 Water Main Replacement (CS-1921B); DWSD (Detroit, MI)

QA/QC Engineer; The Task 1 water main project consists of more than 6 miles of water main replacement mainly within local neighborhoods in the city. A majority of the work is funded by a Michigan Drinking Water State Revolving Fund (DWSRF) loan. The current Task 6 water main replacement design project is similar in that it consists of replacement or rehabilitation of approximately 6 miles of water main in the Dexter-Linwood, Davison, and Buffalo-Charles neighborhoods of the city. This task is also funded through DWSRF, with design efforts expected to be completed in December of 2023. OHM Advisors will assist with preparation of construction drawings, Book 2 specifications, opinion of probable costs at various stages of design, and preparation of documentation and clearances needed to satisfy DWRSF requirements.

US-12 Wastewater Improvements; Pittsfield Charter Township (Ann Arbor, MI)*

Project Manager and lead technical engineer for a multi-phase sanitary interceptor improvement project for Pittsfield Charter Township. Phase 1 design included over 16,000 feet of new 36-inch interceptor sewer with depths reaching up to 40 feet. Included the first open cut application of fiberglass reinforced pipe (FRP/GRP) within the State of Michigan to address concerns of hydrogen sulfide corrosion. Phase 1 construction cost was over \$27 million with subsequent planned phases totaling over \$35 million.

West High Service Pump; City of Ann Arbor (Ann Arbor, MI)*

Served as project engineer and onsite owner's representative for the construction of a new 12 MGD high service pump station at the City of Ann Arbor Water Treatment Plant. The pump station incorporated four dry pit vertical turbine pumps driven by 200 hp VFDs fed from a new motor control center and 3000 KVA substation.

**Completed prior to OHM Advisors.*



Murat Ulasir, PhD, PE

ASSET MGMT ENGINEER

As an Infrastructure Asset Planning Specialist, Murat provides assistance to communities for developing long range infrastructure planning and investment strategies, which support a well-planned and maintained infrastructure network that is sustainable and enhances local community character and identity.

Education

Post-Doctoral Research in Environmental & Water Resources Engineering, University of Michigan (2002)

Doctoral Degree in Environmental & Water Resources Engineering, University of Michigan (2001)

Master of Science in Environmental & Water Resources Engineering, University of Michigan (1996)

Bachelor of Science in Environmental Engineering, Technical University of Istanbul (1992)

Professional Registrations

Professional Engineer
Michigan, #51291 (2003)

**Sanitary Sewer Wet Weather Evaluation Project;
City of Ann Arbor (Ann Arbor, MI)**

Asset Management Specialist; The City embarked on an innovative solution to address basement flooding and sewer overflows through a footing drain disconnection (FDD) program, and now desired to evaluate the program. OHM formulated a detailed plan of action to achieve the objectives. Key concepts in our approach included the following: a public engagement strategy based on building trust and emotional as well as intellectual engagement of stakeholders, multiple approaches to evaluate the FDD effectiveness including the use of the continuous Antecedent Moisture Model that has proven to be very effective. A risk-based approach to assessing potential for basement backup using statistical frequency analysis. A comprehensive evaluation of alternatives that includes green and grey infrastructure and evaluation of new approaches to reducing wet weather basement backup risks. Use of national resources, such as a national expert and the Water Environment Research Foundation, to identify the complete range of alternatives for consideration.

**West Park Storm Sewer Modeling & Forensic Review;
City of Ann Arbor (Ann Arbor, MI)**

Asset Management Specialist; The focus of this project was to re-design existing swirl concentrator units in an effort to provide treatment to the first flush flow rate from the upstream watershed. The project included development of hydraulics and hydrology to serve as the basis for the design for reconfiguration of the existing in-line swirl concentrator devices within the storm sewer system. The basis of design for this project included some innovative approaches to evaluating the first flush flow rate from the tributary areas.

**Water System Modeling & Analysis;
Oakland County Water Resources Commissioner's Office
(OCWRC) (Farmington Hills, MI)**

Asset Management Specialist; OHM Advisors was retained to provide a Water System Sustainability Plan for the City of Farmington Hills. The primary purpose for the requested plan is for DWSD rate reduction. There is recognition that rates can be reduced by implementation of effective storage. Preliminary calculations have shown a relatively short pay-back period for the investment. Secondary concerns include a new model of the system, water quality issues, potential revisions to pressure districts and other typical master plan updates. The resultant update is expected to generate a new capital improvement plan.





Isabelle Bester, EIT

ASSET MANAGEMENT & WATER MODELING ENGINEER

Isabelle is an environmental engineer in the Environmental and Water Resources Group at OHM Advisors. She has experience with supporting disadvantaged communities through technical assistance and understanding of affordability programs. Her technical experience includes hydraulic modeling, system optimization studies, asset management, site plan reviews, emergency planning of water systems, and contract and demand analysis. Isabelle is skilled in various computer programs including ArcGIS, InfoWater, and MS Excel.

Education

Bachelor of Science in Engineering Science: Environmental Engineering, Loyola University Chicago (2020)

Professional Registrations

Engineer In Training (EIT)
Michigan

Water Master Plan; Canton Township (Canton Township, MI)

Isabelle is currently working on the Township’s water master plan update which includes updating the Township’s existing water system hydraulic model and analyzing the water system components and demands to determine the adequacy of the system to meet present and future demands. She will update the Asset Management Plan and determine if there are any fire protection, pressure, or infrastructure problems within the system and offer recommendations for improvement to the Township.

Water Master Plan; City of Milan (City of Milan, MI)

Isabelle is currently working on the City’s water master plan update which includes updating the City’s existing water system hydraulic model and analyzing the water system components and demands to determine the adequacy of the system to meet present and future demands. She created the hydrant test plan and will use the results to calibrate the model. She will assist in updating the Asset Management Plan and determine if there are any fire protection, pressure, or infrastructure problems within the system and offer recommendations for improvement to the City.

Distribution System Modeling; Village of Milford (Village of Milford, MI)

Isabelle is currently working with the Village’s hydraulic model to update the water system model and demands. She is also performing analysis on the system to understand opportunities to redistrict the existing pressure districts to alleviate known pressure concerns. She is also performing water age analysis of the distribution system and standpipes to understand areas of water quality concern within the system and provide operational recommendations to the Village to reduce water quality issues if any exist.

MI Water Navigator; Michigan Municipal League Foundation (MMLF)

The MI Water Navigator Helpdesk is intended to be a one-stop shop for all Michigan communities and water utilities charged with providing safe and reliable drinking water to their customers. Via the Helpdesk, OHM provides technical support and advice to communities and water utilities on water infrastructure funding programs. Isabelle’s main role is to monitor the helpdesk and coordinate technical assistance. She supported the FY2024 Drinking Water and Clean Water State Revolving Fund project planning document development by working with overburdened communities.



Seth Swanson, PE

WATER HYDRAULICS, QA/QC

Seth is a water resources engineer in OHM Advisors' Environmental & Water Resources Group. His agricultural background led him to focus on the analysis and design of hydrologic and hydraulic systems. Seth is involved with modeling water systems and designing system components. He enjoys opportunities to be involved in many aspects of water system engineering to better understand the complexities involved in good design and operation.

Education

Master of Science in Agricultural & Biosystems Engineering,
South Dakota State University (2008)

Bachelor of Science in Civil & Environmental Engineering,
South Dakota School of Mines & Technology (2005)

Professional Registrations

Professional Engineer
Michigan, #6201060067 (2013)

Intermediate Pressure Zone Two Analysis; City of Gahanna (Gahanna, OH)

Performing an analysis of a pressure district expecting large commercial and industrial growth. The district is currently served by two pump stations and an elevated water storage tank. The City desires to know necessary infrastructure and operational improvements to continue to adequately serve the customers in the district.

Crossings New Storage & Booster (Oakland Township, MI)

Performed demand analysis to make storage volume and pumping capacity recommendations. Prepared a Control Narrative to demonstrate how the new facilities will operate within the existing system. Working with project team to finalize design and operations.

Elevated Storage; City of Saginaw, MI (Saginaw, MI)

Performed analysis of the City's existing high service pumps and transmission system's suitability to operate with a proposed elevated storage tank. Made recommendations on how to tie the proposed tank into the system to adequately serve the water system and provide flexibility in future operations.

Elevated Storage Operations Planning; Northville Township (Northville Township, MI)

Performed hydraulic analysis review of design and made recommendations for design changes and operational planning to ensure proper operations of the planned storage.

Water Model Build; City of Farmington Hills (Farmington Hills, MI)

Built a new water model in InfoWater Pro using the latest GIS and demand data available. An extended period simulation was included in the model to determine water age throughout the system.

Temporary Pump Analysis; City of Farmington Hills (Farmington Hills, MI)

Performed analysis on the ability of specific pumps to meet the demands of a portion of the City of Farmington Hills while rehabilitation work was performed on a GLWA transmission main. Worked with a team to acquire all relevant data and provide information on the capabilities and limitations of the pumps and system. Summarized findings and recommendations in a report.





Mackenzie Johnson, EIT

LEAD WATER MODELING ENG.

Mackenzie is an engineer in the Environmental and Water Resources Group at OHM Advisors. Her experience includes water systems modeling, collection systems modeling, data analysis, condition assessment, and field investigation. She also has experience working with GIS, AutoCAD, and water system and collection system modeling software applications. Mackenzie takes pride in her thoroughness and diligence as she works to provide the client with effective and optimal solutions.

Education

Bachelor of Science in Environmental Engineering, Michigan State University (2016)

Professional Registrations

Engineer In Training (EIT)

Professional Certifications

NASSCO, MACP, PACP, LACP

Sanitary Sewer Improvements & Preliminary Engineering Project; City of Ann Arbor (Ann Arbor, MI)

Field Assessment; Mackenzie was extensively involved in the Sanitary Sewer Improvements and Preliminary Engineering project for the City of Ann Arbor. This project involved flow metering, field investigation, data analysis, condition assessment, system modeling, and preliminary engineering to resolve sanitary sewer capacity issues throughout the City. Mackenzie was a part of the field investigation crew and in charge of compiling and analyzing the collected field data as well as the flow metering data. She conducted a condition assessment of the sanitary sewer pipes throughout the City and created GIS maps to display the findings. She was responsible for writing the reports regarding the field investigation discoveries and the flow metering data analysis.

June 25, 2021 Storm Event Analysis; City of Ann Arbor (Ann Arbor, MI)

Project Engineer; for the June Storm Event Analysis project for the City of Ann Arbor. A large rain event in June of 2021 resulted in extensive flooding and basement backups in a neighborhood within the City. This project involved analyzing the storm and sanitary sewer systems to determine the cause of the flooding and basement backups in this area and to provide recommendations on what could be done to prevent these occurrences in the future. Mackenzie analyzed available flow meter and rain gauge data to better understand the extent and intensity of rainfall throughout the City. She also performed sanitary sewer hydraulic modeling to simulate conditions observed during the rain event.

Sanitary Sewer & Stormwater Evaluation Survey, Pittsfield Village; City of Ann Arbor (Ann Arbor, MI)

Project Engineer; for the Sanitary Sewer and Stormwater Evaluation Survey for the City of Ann Arbor. Recommendations from the June 25, 2021 Storm Event Analysis project included performing a sanitary sewer and stormwater evaluation survey within the Pittsfield Village neighborhood to identify sources of inflow and infiltration into the sanitary sewer system. This study involved performing physical condition assessments of the sanitary sewer and stormwater manholes within the Pittsfield Village neighborhood as well as reviewing the City's sanitary sewer and stormwater pipe inspection data to assess their condition. Smoke testing was also performed within this neighborhood to identify sources of inflow and infiltration into the sanitary sewer system.



Christine Spitzley, AICP

WATER RESOURCES & ENVIRONMENTAL PLANNER

Christine Spitzley is a Principal at OHM Advisors serving in a unique role within the Environmental and Water Resources Group (EWRG) and Engineering and Planning Departments. In this role she is responsible for identifying project plans and synergies and connecting professionals among these teams. Christine is a leader in the water resources profession. She is currently Secretary/Treasurer and Incoming Director of the Michigan Section of the American Water Works Association's (MIAWWA) Board, a community of water professionals dedicated to treating, delivering, and protecting clean, safe water for Michigan communities. In addition to being a statewide leader in the field of water resources, Christine has over 30 years of experience leading planning projects and teams.

Education

Bachelor of Science in Urban & Regional Planning,
Michigan State University (1990)

Professional Certifications

American Institute of Certified Planners (AICP)

Michigan Municipal League Foundation; MI Water Navigator (Michigan)

Principal; Christine is leading team in support of MMLF's vision for a MI Water Navigator Helpdesk. The Helpdesk is intended to be a one-stop shop for all Michigan communities and water utilities charged with providing safe and reliable drinking water to their customers. The project is funded by the Mott, Masco and Joyce Foundations and the Michigan Department of Environment, Great Lakes, and Energy (EGLE). OHM's work includes the creation of the MI Water Navigator website that is used to foster communication and education with communities and water utilities. Via the Helpdesk, OHM provides technical support and advice to communities and water utilities on various water infrastructure funding programs.

Water Affordability; Oakland County Water Resources Commissioner's Office (WRC)

OHM Advisors was selected by the Oakland County WRC to support the creation of water affordability plans for the City of Pontiac and Royal Oak Township. Christine serves as Project Manager for the work which is funded under a Michigan Department of Environment, Great Lakes, and Energy (EGLE) Affordability and Planning Grant. Work elements include: creating an affordability plan framework that can be used by other communities; legal analysis of various affordability approaches and potential methods to mitigate legal risk; evaluation and consideration of project partners and other community, state, and federal agencies for applicability to enhance the affordability plans; documentation of affordability plans/program research from across the United States; public outreach and development of communication materials that will support the implementation of the affordability plans and updates to rate structures that incorporate the affordability plans.

Water Asset Management Plans (AMPs) (Various Communities, MI)

Project Manager for Water AMPs for the Cities of Auburn Hills, Westland and Oak Park and Orion and Northville Townships. Required by the Department of Environment, Great Lakes, and Energy (EGLE), these Water AMPs include: an inventory of assets; creation and application of a methodology to critically consider likelihood and consequence of failure; level of service goals; 5- and 20-year capital improvement plans; and a summary of revenue structure and rate methodology to provide sufficient resources to implement the AMPs.





Matt Kennedy, PE

FACILITIES PLANNING

Matt is a design engineer in OHM Advisors' Environmental and Water Resources Facilities Group. He has a breadth of experience including environmental engineering, construction management, and sanitation design in developing nations. His specializations are design, testing, operation, maintenance, and troubleshooting of pumping and control systems.

Education

Master of Science in Environmental Engineering,
University of California, Berkeley
(2011)

Bachelor of Science in Physics,
University of Michigan (2002)

Professional Registrations

Professional Engineer
Michigan, #63627 (2016)

Professional Certifications

OSHA Confined Spaces Entry Training
LEED AP, NC

State Revolving Fund Project Plans (Various Communities)

Cost estimator for new and replacement vertical infrastructure. OHM Advisors prepares twenty or more project plans per year for communities across Michigan which can include improvements to water, wastewater, and stormwater infrastructure.

West Park Booster Station & Island Lake Booster Station Assessment; City of Novi (Novi, MI)

Process engineer to evaluating performance issues with two booster stations. Performed a data analysis and controls changes to provide more consistent system pressures across the city.

Intermediate Zone 2 Water Distribution Planning Study; City of Gahanna (Gahanna, OH)

Lead Engineer for evaluating performance of assets in two existing booster stations. The project included site visits and operator interviews to review operation and maintenance practices, system performance, and controls infrastructure.

7 Mile Road Water Tower & Vault Modifications; Northville Township (Northville, MI)

Lead Process Engineer and Cost Estimator for design of the elevated tank process equipment and controls. The project will allow the township to shave peak usage flow rates which will reduce wholesale water costs. The project includes two control vaults located downstream of connections to the wholesale water distributor, the water tower, and expansion of an existing SCADA system.

Knorrwood Pines Water Storage and Booster Station Design; Oakland County Water Resource Commissioner's Office (Oakland Count, MI)

Lead Process Engineer, Cost Estimator, and Construction Manager for a 1,600-GPM package booster station, 500,000-gallon ground storage tank, permanent generator, controls and SCADA improvements. Project includes improvements to an existing wellhouse including the addition of a chemical room for sodium hypochlorite dosing equipment.

Parkland Plaza Air Release Valve Replacement & Force Main Improvement; Charter Township of Scio (Scio, MI)

Design engineer and construction project manager for the replacement of severely corroded appurtenances and addition of access points. Project includes cleaning and replacement of some sections of force main along with addition of a "breather" valve at a new structure where the force main transitions to gravity.



SECTION B

Professional Qualifications



Water Service Disruption Plan
City of Livonia

Pressure Junctions

- > 100 psi
- > 80 psi
- > 50 psi
- > 25 psi
- > 20 psi
- < 20 psi
- Others

Select Operational Condition

- Baseline System Pressure
- Loss of GLWS Meter Feeds
- Loss of Key City Facilities

Asset ID

- PRV-12

Scenario

- Emergency Disruption (Max Day)
- Planned Disruption (Avg Day)

Steps

- 2 Reduce PRV-04 at LV-12 from 76 psi to 66 psi
Reduce pressures at PRV-04 @ LV-12 from 76 psi to 66 psi
PRV-04
05/31 - 08/30
- 2 Reduce PRV-04 at LV-12 from Alternate 76 psi to 60 psi
Reduce pressures at PRV-04 @ LV-12 from 76 psi to 60 psi
PRV-04
08/31 - 05/30

Monitor Hydrant Pressure Upstream of

City Pressure Range Impact
Pressure Range

Active PRVs	Size (in)	Normal Setting (psi)
PRV-1 @ LV-04	8	64
PRV-2	12	70
PRV-3	12	64
PRV-4 @ LV-12	16	76
PRV-5 @ LV-16	16	71
PRV-6	12	65
PRV-9	18	70
PRV-10 @ LV-14	20	62
PRV-11 @ LV-14	18	62
PRV-12	24	70

City Pressure Range Impact
Pressure Range

Normal Pressure Conditions	Altered System Pressure
Max: 97 psi Min: 47 psi	Max: 98 psi Min: 39 psi

KEY PERSONNEL

Susan Knepper, PE, Lead Engineer

Similar Work in the Area

OUR PORTFOLIO

As our client, you can expect collaboration from a multidisciplinary team that's in lockstep with you from idea to reality—with lots of interaction and exchange along the way. From the start, we really listen to what's important to you and your stakeholders. This dialogue continues with strong consideration of a variety of economic, social, geographic, and environmental factors from different perspectives and culminates in a detailed plan that gives direction, and a path to successful change.

Enhanced Emergency Response Plan

CITY OF LIVONIA



The City of Livonia, Michigan has experienced more severe water system failures with the normal aging of their assets, resulting in chaos for the City operators, administrators, and residents. The City sought improved protocols to

reduce the impact of these emergencies. The City took advantage of the America's Water Infrastructure Act (AWIA) EPA requirements, calling on OHM Advisors to assist in the development of an enhanced Emergency Response Plan.

Emergency scenarios were developed with the City, including the loss of master meter feeds, loss of key City facilities, and the loss of key Great Lakes Water Authority (GLWA) facilities that would impact the City's system. A hydraulic analysis for each of these scenarios was completed using InfoWater Pro software. The impacts of these scenarios were analyzed and the recommended system changes to counteract the asset failures were documented. Our experts in water resources and geographic information system (GIS) mapping took an innovative approach to documenting the protocol for the numerous scenarios that were modeled.

Instead of a typical paper report and hundreds of maps, OHM Advisors utilized ArcGIS Dashboard to create an interactive environment the City could use to help guide them in an emergency scenario. The interactive dashboard displays the City's water system including water main, valves, hydrants, vertical facilities, critical users, and GLWA's facilities. The City can select which scenario they would like to view and step-by-step guidance for that scenario will appear along with the resulting impacts to system pressure. The step-by-step guidance provides details on which system changes need to be made to counteract the failure.

Each step that is related to a City asset will display the respective asset's location in the field. The final step identifies the critical customers impacted by the system changes; the system provides the option to generate an automated email populated with the critical customers' contact information and appropriate text warning the customers of potential service disruptions.

CLIENT REFERENCE

CITY OF LIVONIA
JACOB RUSHLOW, PE,
ASSISTANT DIRECTOR OF PUBLIC WORKS
12973 FARMINGTON RD, LIVONIA, MI 48150
(734) 466-2606



B.1 Similar Work in the Area



2021 Water Master Plan

CITY OF AUBURN HILLS

The City of Auburn Hills purchases their water from the Great Lakes Water Authority (GLWA) through five (5) master meter locations. The City has 5 pressure districts and approximately 190 miles of water main. The City serves Oakland Community College - Auburn Hills Campus - as well as a range of residential, commercial, and industrial customers. The City has 15 pressure reducing valves, 4 actuated valves, a 1-million gallon (MG) elevated storage tank, and 1 booster pump station.

OHM Advisors assisted the City of Auburn Hills (City) with preparation of their 2004, 2009, 2014, and most recently, their 2021 Water Master Plan. As part of the early planning efforts, OHM identified through conversations with City operators and a hydraulic analysis of the City's water system, the need to improve pressure within the system through pressure district redistricting and the installation of a booster pump station facility. In addition, a 1-MG elevated storage tank was recommended to increase fire protection rates within their main industrial service area.

The 2021 Water Master Planning effort satisfies the Department of Environment, Great Lakes, and Energy (EGLE) Act 399 Reliability, General Plan, and Asset Management Plan (AMP) requirements. A detailed demand analysis was completed which included a review of master meter data and advanced metered infrastructure data to identify the City's average daily, maximum daily, and peak hour demands. Diurnal patterns were developed for the City's system for each demand scenario. Three planning periods were assessed (existing, 5-year, and 20-year) that incorporated City planning efforts and population projections.

OHM Advisors developed a hydrant and pressure monitoring test plan to aid in model calibration. OHM Advisors assisted City staff with field testing. OHM Advisors converted the City's InfoWater model to InfoWater Pro to perform the hydraulic modeling for the project. This included updating the model with new water main, confirming pipe material/diameter, and calibration.



**2021 WATER MASTER PLAN;
CITY OF AUBURN HILLS CONTINUED...**

Customer demand data was distributed based on their meter location and diurnals were assigned. Operational criteria was updated in the model. The model was calibrated to field conditions and non-revenue water was found to be more prevalent in their industrial area through the calibration efforts. An extended state model was ultimately developed to utilize for operational decision-making and water age analysis.

The updated model was assessed under the existing and future conditions and the system’s ability to satisfy regulatory requirements and internal level of service goals. System capital projects and operational recommendations were identified to address deficiencies with pressure and fire protection rates. Operational recommendations were also provided to optimize the City’s booster station and elevated storage tank operations as it was determined that the tank level pressure transmitter was falsely reporting tank level during high fill or drain rates, as shown in the figure.

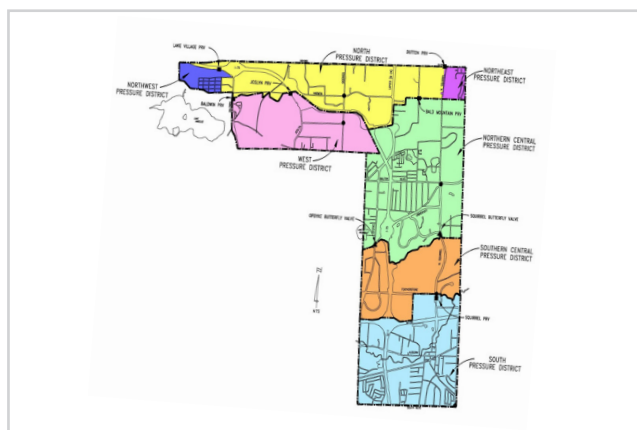
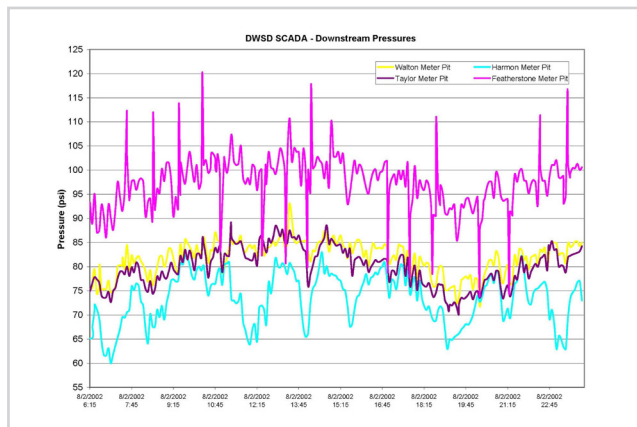
The City’s AMP was also updated which included a review and update to their assets condition/probability of failure (POF), consequence of failure (COF), and business risk exposure (BRE) scores. The hydraulic analysis and AMP capital recommendations were combined to create one comprehensive Capital Improvement Plan (CIP) that identifies necessary improvements for the existing, 5-year, and 20-year planning periods.

KEY PERSONNEL

Susan Knepper, PE, Lead Drinking Water Engineer
Isabelle Bester, EIT, Modeling & Asset Management Support

CLIENT REFERENCE

CITY OF AUBURN HILLS
JASON DEMAN, MGMT OF PUBLIC UTILITIES
1827 N SQUIRREL ROAD,
AUBURN HILLS, MI 48326
(248) 364-6912



B.1 Similar Work in the Area

Water Master Plan

CHARTER TOWNSHIP OF CANTON

OHM Advisors assisted the Charter Township of Canton (Township) with preparation of their 2018 Water System Master Plan and is currently preparing an updated 2023 Water System Master Plan. The Township's Water System Master Plan incorporates three components: a Water Reliability Study, General Plan, and Asset Management Plan (AMP). This plan addresses all requirements of the Safe Water Drinking Act.

The Reliability Study portion of the plan focuses on planning items including population and water demands for three planning periods (existing, 5-year, and 20-year). Average day, maximum day and peak hour water demand are calculated for each planning period, and fire protection needs are identified. The Reliability Study also documents the capacity of the existing water source, pumping capacity, and storage and compares that capacity to the existing and future needs of the system.

For the Township, OHM Advisors evaluated the ability for Great Lakes Water Authority (GLWA) to provide adequate water volume at contract pressures. The General Plan included the hydraulic analysis of the system and detailed mapping/inventory of the water system.

OHM Advisors utilized Innovyze's Innovyze/Autodesk InfoWater Pro InfoWater software to perform the hydraulic modeling for the project. This included updating the model with new water mains, confirming pipe material/diameter, and calibrating to field conditions. Updated water demands, operational critical criteria, and elevation data were input into the model to simulate pressures and available fire protection flows.

To calibrate the water model, OHM Advisors performed hydrant flow testing throughout the service area. The updated hydraulic model was provided to the Township to address anticipated development and water construction permits within the service area.

A comprehensive GIS mapping of the water system was developed for the Township showing service boundaries, location of water system components, water main size, material, age and the location of hydrants and valves. The AMP includes condition assessment, failure risk analysis, and revenue structure to look at life-cycle costs of system operation, maintenance, and infrastructure repair or replacement. Along with data from the Reliability Study, this forms the basis for a comprehensive Capital Improvement Plan (CIP).

The CIP identifies necessary improvements for the 5-year and 20-year planning periods. The Township can then address high-priority asset needs that are critical to the Township infrastructure performance, hydraulic capacity, and planning for future capital and operating expenditures.

KEY PERSONNEL

Chris Elenbaas, PE, Project Manager
Susan Knepper, PE, Lead Drinking Water Engineer
Isabelle Bester, EIT, Modeling & AMP Engineer
Matt Kennedy, PE, Facilities Engineer

CLIENT REFERENCE

CHARTER TOWNSHIP OF CANTON
JOHN SELMI, PUBLIC WORKS MANAGER
1150 S. CANTON CENTER, CANTON, MI 48118
(734) 397-1011



Water Reliability Study & Plan

VILLAGE OF MILFORD

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) requires a Water Reliability Study and General Plan be prepared for municipal systems and updated every five years. The Village of Milford sought OHM Advisors' services to prepare this plan. The required elements of the Water Reliability Study include population and water demand projections for existing 5-year and 20-year planning periods along with a capacity and needs assessment of the water source, treatment and storage components. The General Plan requirements include the creation of a comprehensive water system map, hydraulic analysis of the water system displaying system pressures and available fire protection, and a capital improvement plan for the 5-year and 20-year planning periods.

The Village of Milford draws groundwater from two wells located in Central Park. Well pumps convey the water to the water treatment plant (WTP) also located in Central Park. The water first enters the aerator and then flows into a 40,000-gallon holding tank. Three 75-hp high service pumps force the water through iron removal filters prior to entering into the system. The average daily water demand is 785,000 gallons per day.

The existing computer water model was updated in InfoWater Pro and used to perform the hydraulic analysis. Wells, treatment, storage and high service pump operating data was input into the model to simulate actual operating conditions. Existing water demand was calculated using water billing records, and peaking factors for maximum day and peak hour were based on pumping records. The model was calibrated using hydrant flow test data. Existing pressures for average day, maximum day and peak hour demand periods were simulated as well as available fire protection rates.

SEMCOG future populations projections were used to forecast the 5-year and 20-year population and resulting water demand projections. The model was then used to predict anticipated system pressures and available fire protection for these future planning periods.

A planning level analyses and cost estimate for two alternatives for connection of the Family Drive production well to the water supply system were completed. The alternatives consist of raw water transmission to the existing iron removal treatment plant and building a new iron removal treatment plant at the Family Drive well site. Additionally, recommended system improvements necessary to meet the present and future needs of the community were identified to improve system pressures and reliability. OHM Advisors has started implementing water main improvements on road projects this construction season.

KEY PERSONNEL

Mackenzie Johnson, EIT, Lead Engineer
Susan Knepper, PE, QA/QC

CLIENT REFERENCE

VILLAGE OF MILFORD
MIKE KARLL, DIR. OF PUBLIC SERVICES
1100 ATLANTIC ST., MILFORD, MI 48381
(248) 685-3055



B.1 Similar Work in the Area



Water Model Update

OAKLAND CO. WATER RESOURCES COMMISSIONER

The hydraulic model of the City of Farmington Hills' drinking water system was rebuilt in InfoWater Pro using their latest GIS and demand data. The model was calibrated using hydrant test data provided by the office of the Oakland County Water Resources Commissioner. As part of the calibration process, recommendations were made for valve positions to verify, equipment to perform maintenance on, and improvements to future hydrant testing. The model was then used to identify problem areas in the system and develop potential solutions to improve the levels of service within the City. The model has also been used subsequently for as-needed analysis to guide active infrastructure improvements.

Water age modeling was also performed for the City's water system. Water age modeling utilized demand patterns from early spring when water demands in the City were observed to be at their lowest. Water age modeling also required accurate representation of system operations in the model. Control valves within the system have variable settings based upon time and water level in the City's elevated water storage tank in order to make effective use of the storage. Model calibration included verification that controls in the model resulted in an accurate representation of flow rates at controlled sites and storage water levels. The water age model was used to identify areas of the City with the oldest drinking water for prioritization of water quality monitoring.

KEY PERSONNEL

Mackenzie Johnson, EIT, Project Manager
 Seth Swanson, PE, Project Engineer
 Murat Ulasir, PhD, PE, QA/QC

CLIENT REFERENCE

OAKLAND CO. WATER RESOURCES COMMISSIONER
 AMY PLOOF, PE, CHIEF ENGINEER
 ONE PUBLIC WORKS DRIVE, BUILDING 95W,
 WATERFORD, MI 48328
 (248) 858-0958

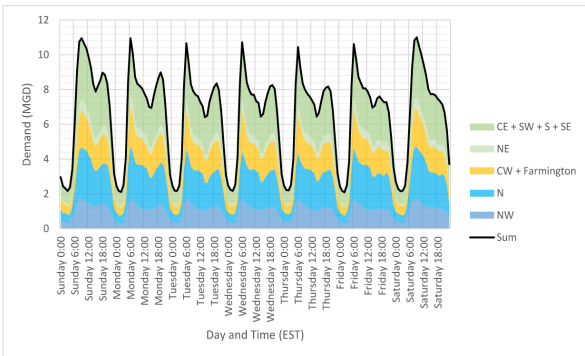


Figure 3: Low Demand Pattern from Spring 2019

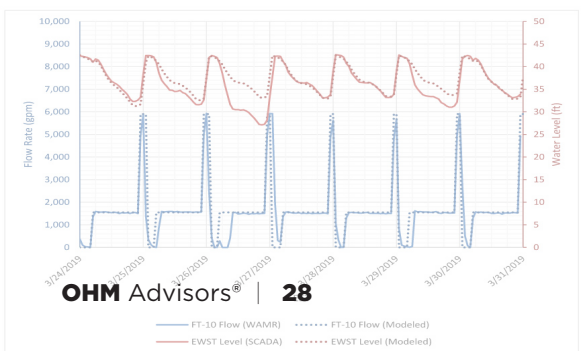
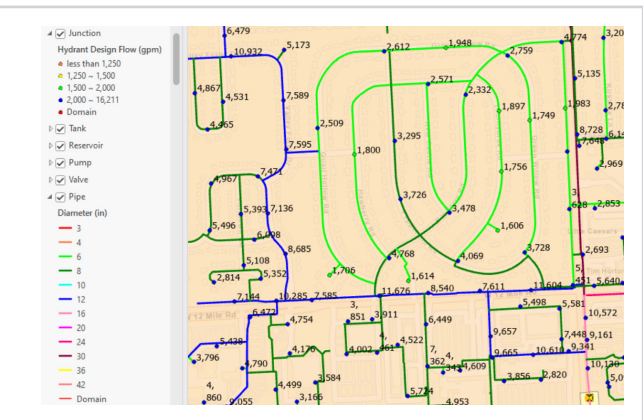


Figure 7: Comparison of SCADA / WAMR Observations to Model Results of Extended Period Simulation



Water System Evaluations

CITY OF SAGINAW

The City of Saginaw has contracted OHM Advisors' Environmental and Water Resources Group to perform various projects throughout our long standing history together. The Aqua Pump Station Analysis and the Elevated Water Storage Tank were two important projects came out of our Water Systems Evaluations for the City.

The Aqua Pump Station serves communities north and west of the City of Saginaw who purchase water from the City as wholesale customers. One community, Saginaw Township, operates an elevated water storage tank that can have trouble fully filling at times. The City wanted to know the adequacy of the Aqua Pump Station to meet the demands of the service area and potential ways to improve its performance.

To perform the analysis and make informed recommendations, updates were made to the City's hydraulic model to more accurately represent the Aqua Pump Station infrastructure and operations. Pipe roughness values of the model were also updated based on pressure monitoring data to bring the model into line with observed pressures. The model was converted from InfoWater to InfoWater Pro for this project.

Analysis of the City's water system confirmed that the City would struggle to provide the pressure necessary to the Township for them to fill their elevated storage. Recommendations were made that the model indicated would improve the service pressures enough for the township to fill their elevated storage. Recommendations included installation of a new pressure reducing valve (PRV) at a point in the City's system to reduce the occurrence of circular pumping in the system while also raising the discharge pressure of the Aqua Pump Station.

The City of Saginaw is designing an Elevated Water Storage Tank (EWST) to provide consistent pressures to the City's water system particularly during power outages which can impact their ability to provide adequate service pressure from their High Service Pumps (HSP) at their Water Treatment Plant (WTP). OHM Advisors provided the initial analysis to make sizing and location recommendations of the EWST and is currently working as a subconsultant to perform analysis and make recommendations on changes to the City's transmission system and HSP operations. The City desires to have flexibility in future operations. Through analysis and conversations with the City and project team, OHM Advisors has made recommendations that will adequately tie the EWST into the City's system while leaving room for changes to future operations as may be needed and desired by the City.

KEY PERSONNEL

Seth Swanson, PE, Lead Engineer
Mackenzie Johnson, EIT, Engineer & QA/QC
Murat Ulasir, PhD, PE, Modeling & AMP Engineer
Matt Kennedy, PE, Facilities Engineer

CLIENT REFERENCE

CITY OF SAGINAW
PAUL REINSCH, DIR. OF WATER & WASTE
1315 S. WASHINGTON AVE., SAGINAW, MI 48601
(989) 759-1520



B.1 Similar Work in the Area

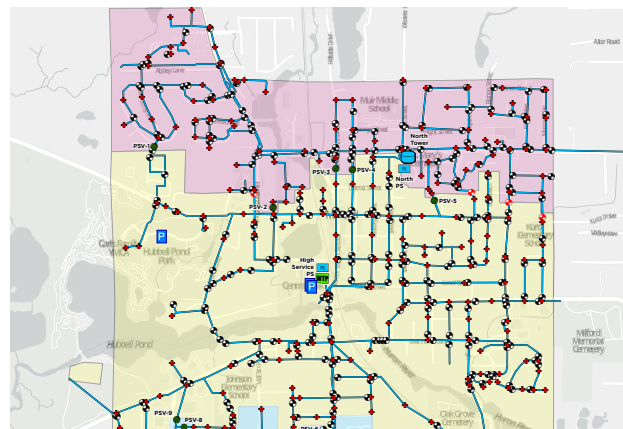
Water System Redistricting Analysis & Pump Station Controls Assistance

VILLAGE OF MILFORD

The Village of Milford identified several areas within its water distribution system that experience relatively low pressures. Additionally, the Village desired to better understand its water age throughout the distribution system and within its two standpipes, as the Village expressed concern that there may be insufficient demand to create the desired turnover which could impact water quality. OHM Advisors was retained by the Village to perform the water age analyses as well as to perform hydraulic water modeling to determine whether the low-pressure areas could be moved to a different pressure district that would provide higher service pressures.

To address these concerns, OHM used the Village's hydraulic water model to redistrict the low-pressure areas into an adjacent pressure district that would provide higher service pressures. OHM Advisors used the InfoWater Pro modeling software to perform this analysis. (VFDs) that would allow for automatic operation of the pump stations since they are currently run manually. Water main valves were open and/or closed in the model to adjust the pressure district boundaries such that the low-pressure areas were moved into a different pressure district. OHM Advisors compared the pressures and fire protection capacities before and after the redistricting was performed in order to provide recommendations on whether the low-pressure areas should be redistricted.

The hydraulic model was also used to perform a water age analysis to identify areas throughout the distribution system that may have diminished water quality due to the water age in that area. In a similar effort, OHM Advisors also analyzed the Village's SCADA data to calculate the water age within the water storage standpipes in order to make a recommendation on whether mixers should be installed to maintain water quality within the standpipes.



As a result of the Village's recent Water Master Planning efforts, it was recommended that both of the Village's North and South Pump Stations be equipped with Variable Frequency Drives. The Village of Milford requested assistance in integrating the South Pump Station VFDs into their SCADA system. The North Pump Station is not yet equipped with VFDs. OHM Advisors assisted the Village in performing hydrant flow tests to evaluate the existing pump capacities at the South Pump Station, and also worked with the Village's SCADA provider to develop the control logic for integration of the VFDs. The same effort will be performed when the North Pump Station is equipped with VFDs, and OHM Advisors looks forward to assisting the Village with that effort.

KEY PERSONNEL

Vicki Putala, PE, Principal
Sally Bos, Client Representative & Project Manager
Mackenzie Johnson, EIT, Assistant Project Manager
Isabelle Bester, EIT, Modeling Engineer
Seth Swanson, PE, Facilities & Controls Engineer

CLIENT REFERENCE

VILLAGE OF MILFORD
MIKE KARLL, DIR. OF PUBLIC SERVICES
1100 ATLANTIC ST., MILFORD, MI 48381
(248) 685-3055



Recent Work with the City

OUR PORTFOLIO

Sanitary Sewer & Preliminary Engineering

CITY OF ANN ARBOR

The Sanitary Sewer Improvements & Preliminary Engineering (SSIFE) project involved performing flow metering, sewer investigations, modeling and preliminary engineering for improvements to several interceptor sewers in the city. The study focused on six interceptor areas that were identified in the City's Sanitary Sewer Wet Weather Evaluation Project (SSWWE) completed in 2015.

The SSWWE, also performed by OHM Advisors, provided the basis for the City's long-term planning and improvements for the sanitary sewer system. As background, a summary of that project is provided here. The City of Ann Arbor performed approximately 2,700 footing drains disconnections (FDDs) from their sanitary sewer system between 2001 and 2012. In 2014, the City retained OHM Advisors to perform an evaluation of the effectiveness of the FDD program and develop alternatives for improving the sanitary system. The results of the study showed that the FDD program significantly reduced the risk of basement backup in the five target FDD neighborhoods, and that it was not necessary to continue the FDD program. However, the study also showed that there were six areas in the interceptor system that were overloaded during design flow conditions.

The results of the SSIFE project provided the City with a comprehensive road map for managing and improving the sanitary sewer collection system to meet current and future needs.

The SSIFE project involved development of preliminary engineering designs and cost estimates for the six interceptor areas. The scope of the project included these components:

Flow Metering: Performed by OHM Advisors to understand local flows and system performance.

Sanitary Sewer Evaluation Survey (SSES): CCTV review, smoke testing and manhole inspections to understand the physical conditions of the project areas.

Hydraulic Modeling: Modeled each project areas to aid in sizing improvements and evaluate alternatives.

Preliminary Design: Conducted field reconnaissance, preliminary design and cost estimates to inform the City's CIP for project staging.

Public Engagement: Performed within each project area to inform the public of the need for the projects and solicit their input on solutions.

KEY PERSONNEL

Robert Czachorski, PE, Project Manager
Mackenzie Johnson, EIT, Lead Engineer

CLIENT REFERENCE

CITY OF ANN ARBOR
BRIAN SLIZEWSKI, PE, SR. PROJECT ENG.
301 E HURON ST., ANN ARBOR, MI 48104
(734) 794-6410



2023 Miscellaneous Utility Projects

CITY OF ANN ARBOR

As part of their asset management approach to capital improvements, the City of Ann Arbor combined multiple local street locations for their annual water main replacement and road resurfacing programs for the 2023 construction season. OHM Advisors was selected to perform the engineering design for water main replacement and road resurfacing needs for four local streets - Carmel Street, Easy Street, Provincial Drive, and Glendaloch Road. The scope of the project included determining horizontal alignment and construction methodology for the water main replacements, road cross-sectional requirements, and storm system needs. After the bid package was issued, the City determined that a nearby sanitary sewer on Arlington Boulevard needed to be replaced, and OHM Advisors developed the design for this work for the City to obtain a quote from the selected contractor.

In addition, the City had previously bid a project on North Seventh Street to abandon an old crosslot sanitary sewer that required the relocation of a single remaining service lead from the sewer to be abandoned to the sanitary sewer in the roadway, but received no bids, so OHM Advisors updated these plans to include in the project design plans as well. This work was near a County Drain and required coordination and a permit application to the Washtenaw County Water Resources Commissioner's office.

CLIENT REFERENCE

CITY OF ANN ARBOR
TRACY ANDERSON, PE, PROJECT MANAGER
301 E HURON STREET, ANN ARBOR, MI 48104
(734) 794-6410





SECTION C

Proposed Work Plan

Proposed Work Plan

OUR PLAN OF ACTION

The City of Ann Arbor's Public Services Area (AAPSA) maintains a water distribution system dating back to the late 1800's that serves a unique customer base including the University of Michigan (U of M), Scio Township, and Ann Arbor Township. The City of Ann Arbor (City) draws its drinking water from both surface and groundwater sources and treats it at their Water Treatment Plant (WTP) facility. Downstream of the City's WTP there are four remote pumping stations, two elevated storage tanks, three underground storage tanks, and one ground storage tank.

The distribution system is supported by multiple City service units within the AAPSA, including the Water Treatment Services Unit, which is responsible for the City's vertical water assets, the Public Works Unit, which is responsible for the City's linear water assets, and the Systems Planning Unit, which supports the water system with capital planning and asset management. Together these units work to meet the City's Level of Service (LOS) goals originally developed in 2015 to ensure high quality drinking water is delivered to all customers.

As the City continues to attract residential and commercial development and support an expanding University it is critical for the City to maintain an updated Comprehensive Water Distribution Plan and hydraulic model. OHM Advisors (OHM) is pleased to submit our proposed work plan for the development of the City's water distribution plan and update to the hydraulic model. The following sections describe our overall project approach and understanding, and the resulting detailed project work plan to execute this large planning effort.

Project Approach

To meet the expectations of the City and the varied project goals outlined in this RFP, the selected consultant requires a strong foundational background of drinking water systems as well as an absolute commitment to teamwork, project management, coordination, and responsiveness. OHM is uniquely qualified for this project because we provide a highly qualified and motivated team of engineers and technicians under an organizational structure and culture that promotes innovation, efficiency, and exceptional service to our clients. This allows OHM to build longstanding relationships with our clients as partners in their ongoing efforts to provide a high level of public service to their community. We look forward to following this model of success and continue our positive relationship with the AAPSA Systems Planning Unit to execute this project.

OHM's deep understanding of the City and its operational dynamics, strategically positions our highly skilled team for the effective execution of this project. OHM not only possesses a comprehensive understanding of the applicable regulatory standards, but also a strong knowledge of City-specific standards, procedures, and key personnel necessary to proficiently carry out this project.



PROPOSED WORK PLAN CONTINUED...

To further enhance our alignment with the City's RFP objectives, our management team for this project includes individuals with extensive experience tailored to meet the City's specific needs:

- **Robert Czachorski, PE**, a trusted advisor and project manager to the City of Ann Arbor for nearly a decade with a strong foundational understanding of working successfully with the City's Systems Planning Unit.
- **Susan Knepper, PE**, a great lakes region drinking water expert with a track record of assisting more than twenty communities on comparable projects. She has been instrumental in supporting the City with its Brightly Predictor projects over the years.

To further align with the City's objectives and enhance our access to essential resources, we also have the distinct advantage of **Chris Elenbaas, PE**. Chris' previous tenure with the City's Public Works Unit and track record with the City's WTP positions him not only as a key participant on this project, but also as a liaison capable of guiding us to the right individuals and resources, which will be invaluable for the success of this project.

The Comprehensive Water Distribution Plan and Model Update represents a compilation of historic and present studies, as well as Capital Improvement Plan (CIP) needs the City is seeking to address, which will require a sophisticated and coordinated approach with a diverse and talented team. We have assembled our proposal with project members that will deliver this project in a successful and meaningful way. Below are the main principles of our approach:

Create a Shared Vision

Project processes will incorporate flexibility, offering the latitude to think outside the box to reach the final and optimal methods of execution and delivery. We will work iteratively, examining potential alternatives to reach the most effective solutions and recommendations. We understand how to balance project desires with finite available resources, and our team will seek to efficiently leverage resources to deliver an exceptional project to the City.

Deliver Engineering & Water Resources Excellence

For over 50 years, OHM has served as trusted advisors to communities throughout the Midwest region. Our success comes from an unyielding passion for finding innovative solutions for our clients with the goal of advancing communities. Our team members are leaders in their respective fields and our strategy thoughtfully integrates our unique skills to successfully execute and deliver on this project.

As this is a drinking water project, our Water Resources team will assume the primary role. Our Water Resources team brings energy and a wealth of technical expertise in the reservoir of drinking water analytics. The passion of our drinking water experts is unmatched as we seek the most sustainable solutions for communities to harmonize innovation, affordability, and service excellence.

PROPOSED WORK PLAN CONTINUED...

As outlined in our past involvement with similar projects, our **DRINKING WATER TEAM LEADERS** (listed below) has successfully helped communities solve their most challenging drinking water challenges including, but not limited to:

- Water Master Planning
- Optimizing System Operations
- Contingency Planning for Emergencies
- Emergency Response
- Asset Management Planning
- Capital Planning



Susan Knepper, OHM's Drinking Water Expert, has not only spearheaded modeling, hydraulic analysis, and asset management planning within OHM but has made a significant impact on a national and international scale through her active involvement with the American Water Works Association (AWWA). With over a decade of experience, Susan's contributions to AWWA have led to the advancement of drinking water knowledge in Michigan and

beyond. Her extensive involvement in delivering presentations, sharing expertise, and collaborating with professionals worldwide has bridged the gap between local and global best practices, benefiting both her local Michigan community and the broader industry. Susan has performed dozens of modeling analyses for communities of all sizes and system complexities. Susan was integral in leading the modeling effort for Michigan's largest water distribution network which involved a large team of professionals in the fields of engineering, law, policy, and operations. She was ultimately instrumental in developing a process to identify what water mains served a regional (transmission) vs. local (distribution) purpose.

Chris Elenbaas, is an experienced municipal engineer who has spent years working closely with all areas of the City's water supply system including the Water Treatment, Public Works, and Systems Planning Units. He brings a great understanding of all elements of the City's water system and will provide insight throughout the project on modeling, QA/QC, planning and asset management.

Seth Swanson, a seasoned hydraulic modeling specialist with an impressive track record of over 12 years of experience in drinking water analytics and modeling. He will oversee the Quality Assurance/Quality Control (QA/QC) aspects of this project.

Murat Ulasir, holds a Ph.D. in Environmental and Water Resources engineering and is an expert in asset management planning for above and below ground infrastructure assets. He will contribute to the QA/QC aspects of this project and provide forward-thinking recommendations for innovative project delivery.

Mackenzie Johnson, a hydraulic modeling expert well-acquainted with the City. She will assume a leading role as a modeler for this project. With more than 8 years of experience in drinking water and collection systems modeling and analysis, Mackenzie has made substantial contributions to numerous water resources initiatives within the City over the past several years.

PROPOSED WORK PLAN CONTINUED...

Isabelle Bester, will serve as hydraulic modeling lead and asset management lead, having over 3 years of experience, predominantly focused on drinking water analytics and modeling at OHM.

Matthew Kennedy, a process engineer with 20 years of experience in construction management and engineering. He will serve as capital planning lead and cost estimator.

Public Engagement

The leadership for the Public Engagement task for this project will be entrusted in OHM's Christine Spitzley and Susan Knepper. Successful public engagement builds trust on two levels: 1) trust in the project team's technical competence and 2) the project team's ability to effectively convey this information to the stakeholders. Given the potentially sensitive nature of portions of this project, it is critical that the team understand how to properly convey this information in an easy-to-understand format.

The pairing of Christine, who serves as the Vice President of the American Water Works Association (AWWA), and Susan Knepper, an active member of MI-AWWA who currently holds the position of Chair of the MI-AWWA social media committee, forms a highly skilled and specialized team to lead the public engagement portion of this project. Together, they offer a uniquely qualified approach that stems from their technical expertise of drinking water systems and their extensive involvement in AWWA. Generational insights and extensive industry experience will contribute to the project's overall success.

Project Management

This project offers the opportunity to create an all-encompassing water distribution strategy, 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.

Together, the management team of Robert Czachorski and Susan Knepper will oversee various facets, including analysis and hydraulic modeling, while ensuring seamless coordination and obtaining necessary approvals from the City. 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.

PROPOSED WORK PLAN CONTINUED...



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.

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.
- At the Kick-Off Meeting a schedule of Project Check-In/Status Meetings will be set at recurring intervals along with identifying key milestones and delivery dates. For this project, OHM has anticipated bi-weekly Project Check-In/Status Meetings with the City’s Project Manager. This standing meeting will occasionally be used for more extensive discussions with other City stakeholders.

OHM Advisors’ Deliverables

Meeting Presentations

Meeting Agendas

Meeting Minutes



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 the best possible work product consistent with our clients’ goals 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 for project reviews is included in the project schedule. Reviews are tracked and documented by each team member to certify 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.



Project & Task Understanding

The following section details OHM's understanding of this project, our approach to execution, and details of how OHM plans to meet and exceed the City's requirements for this project. This is followed by our detailed Scope of Work identifying the individual steps that OHM will take to deliver on each required task.

The details in this section support their corresponding Scope of Work items to assist the City in gaining a deep understanding of OHM's vision within the broader context of the project.

The City is seeking an update to their water distribution plan and hydraulic model. Although the previous comprehensive plan and hydraulic model calibration was completed in 2010, the City has proactively continued to update the model with system improvements since this effort.

A Comprehensive Water Distribution Plan goes beyond assessing the hydraulic capacity to meet present and future needs; it also evaluates risk of existing assets, considering factors like probability of failure (POF) and consequence of failure (COF). The City has been proactive in recognizing the importance of asset management planning with a detailed review of their system completed in 2015, which established level of service (LOS) goals for their system and a Prioritization Action Number (PAN) for their assets. OHM is currently working on bringing this information into the Brightly Predictor software.

Between 2010 and present day, the City has successfully executed multiple projects linked to their water system, with ongoing advancements currently underway. As part of this project, OHM will develop a Comprehensive Water Distribution Plan that adeptly captures the requested scope of services and integrates the previous studies that are related to these services. Considering that many of these earlier studies exist independently of each other, it is OHM's goal to create one complete and Comprehensive Water Distribution Plan that captures the institutional knowledge of the water system and can serve as an invaluable resource for the City.

PROJECT INITIATION & INFORMATION GATHERING

 SEE SCOPE OF WORK TASK 1

While the RFP references supporting information dating back to 2010, it's important to acknowledge that the water system has a rich history dating back to the late 1800s. Understanding the historical context is pivotal when developing a comprehensive distribution plan. Discussions with City staff, operators, and applicable stakeholders can reveal invaluable insights that may not be documented, underscoring the importance of collaboration throughout this project. While the commencement of this project will begin with a thorough initial information gathering, through both document review and discussions, it is likely that throughout the project new insights will arise that will require further conversations with the key stakeholders. This evolving task is essential to capture the entirety of the system narrative and ensure the success of the project's ultimate deliverable.

PROPOSED WORK PLAN CONTINUED...



Information Request

OHM will compile a data request letter outlining information needed and the appropriate channels to send information through prior to the project kick-off meeting. This will allow OHM to review the available data and be prepared to discuss next steps at the kick-off meeting.

The comprehensive drinking water plan should incorporate previous studies and analysis including:

- 2010 – Drinking Water Distribution Master Plan/Water Model (CDM)
- 2015 – Water Distribution Level of Service & Capital Reinvestment Study (AECOM)
- 2017 – Water Distribution Modeling Scenarios (FTCH)
- 2017 – Water Asset Management Program Report (FTCH)
- 2021 – City of Ann Arbor/University of Michigan Water Connectivity Analysis (CDM)
- Present – Water Treatment Plant Facility Plan (AECOM)
- Present – Comprehensive Land Use Plan (City of Ann Arbor Planning Department)
- Present – Capital Predictor Reinvestment Strategy (OHM)

In addition, the following information shall be collected, reviewed, and assessed:

- InfoWater Hydraulic Model
- Water System Geographical Information System (GIS)
 - *Water Main, Hydrants, Valves, Leads, Customer Meters (linked to billing data), Zoning, Pressure District, Vertical Assets, Break Data*
- Wholesale Customer Supply Agreements
- City's Water Meter Billing Data
- Water Main Consolidation Practice
- Supervisory Control and Data Acquisition (SCADA)
- Monthly Operating Reports (MOR)
- Bacteriological Sampling Data
- Operation and Maintenance Manuals
- United States (US) Census and Southeast Michigan Council of Governments (SEMCOG) Population Data
- City's Water Pressure Policy
- Historical hydrant flow testing data
- Capital Improvement Plan
- City's current water system emergency programs
- City's current valve turning and hydrant flushing program
- Public Services Standard Specifications





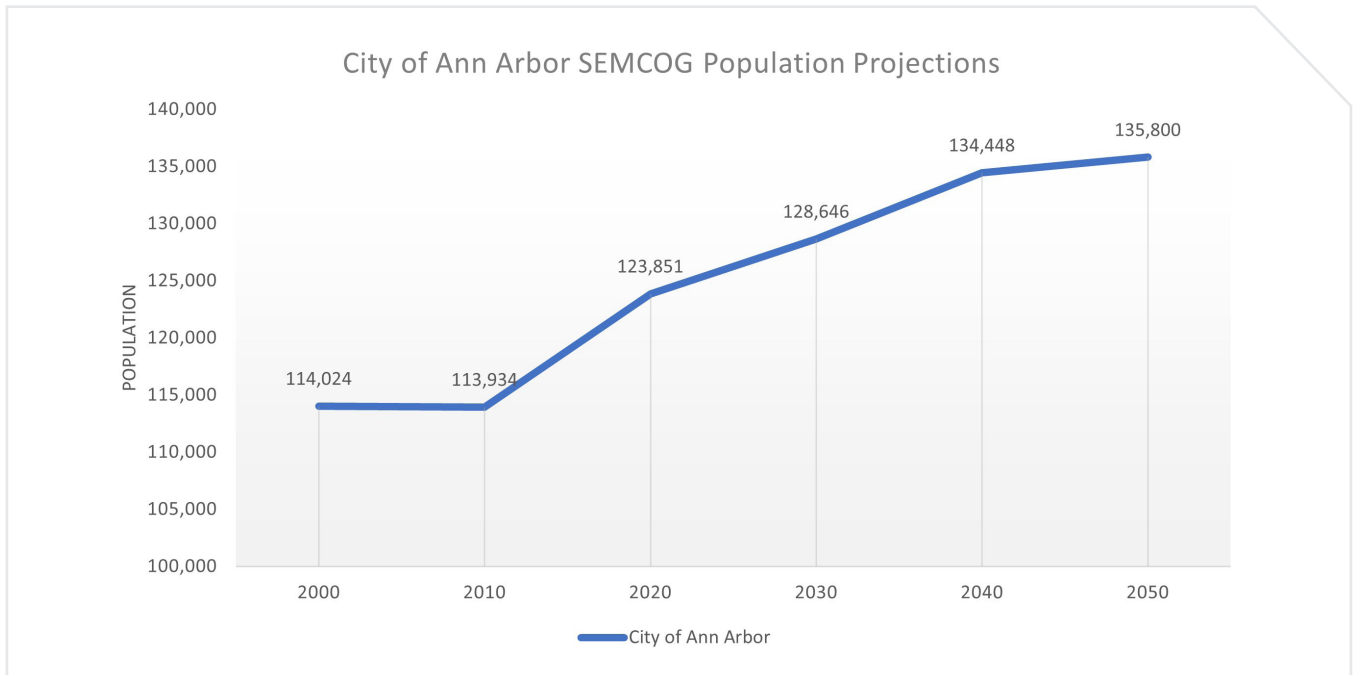
PROPOSED WORK PLAN **CONTINUED...**

 SEE SCOPE OF WORK SUBTASK 1B

Interviews & Workgroups

Once the requested information is reviewed and verified, OHM will arrange meetings involving essential City personnel and relevant stakeholders to address any inquires in information required for the effective completion of the study. OHM will proactively establish workgroups comprising of essential City personnel and relevant stakeholders. This includes, but is not limited to, the following stakeholders:





PROPOSED WORK PLAN CONTINUED...

Key information from the interviews will be documented and utilized as applicable in the Comprehensive Water Distribution Plan. Institutional knowledge, especially from City field staff and operators, will be incorporated and a hub will be created to store this information based on what category of the drinking water system it falls under.

External Stakeholders are essential to engage with during this large-scale planning effort as their internal plans can impact the City’s system and outcomes of this project. OHM has trusted relationships with all non-city stakeholders that would relate to this effort, simplifying the coordination of this initiative.



PLANNING & DEMAND PROJECTIONS

OHM will evaluate and analyze existing population and consumption data. This component of the hydraulic model refresh will require collaboration between City planning, public works, operations, OSI, and external stakeholders to ensure future conditions are accurately incorporated into the City’s Comprehensive Water Distribution Plan. The 2022 and 2023 average daily demand, minimum daily demand, maximum daily demand, and peak/max hourly demand data will be calculated by utilizing the WTP production data and the City meter billing data. A mass balance will be completed to ensure water that is either entering or leaving internal system storage is accurately considered when determining system demands. OHM proposes to review and vet the 2019 (pre-COVID-19) demand data currently in the City’s model and the anticipated demand analysis completed by AECOM as part of the Water Treatment Plant Plan.



PROPOSED WORK PLAN CONTINUED...

In addition to establishing a University of Michigan summer month demand scenario, OHM will review monthly average demand data to determine the City's overall lowest average demand month to assess potential water age/quality conditions. This demand data will be utilized to build water age scenarios to assist in operational recommendations as part of Task 4: Hydraulic Analysis. OHM will provide a final recommendation to the City for the following existing demand scenarios which will serve as the basis for future projections:

- Average Day
- Minimum Day
- Maximum Day
- Peak Hour
- Water Quality
- (University of Michigan Summer & Lowest Average Demand Month)

Once the baseline demand scenarios are agreed upon by the City, hourly average diurnals will be calculated based on customer type. It is anticipated hourly average diurnals for the following customer types will be developed with more specific classes identified once data is assessed:

- Residential
- Commercial
- Irrigation
- Large Unique Users (University of Michigan, Public Schools, etc.)
- Wholesale Customers (Scio Township, Ann Arbor Township)

It's understood that the City Planning Department is in the process of developing a Comprehensive Land Use Plan identifying anticipated areas of densification. This effort will incorporate known developments including the University of Michigan dorm expansions and future growth of the West Stadium Boulevard corridor. OHM is currently working with these growth projections for mater planning efforts within the sanitary sewer system and will working closely with the City to incorporate this same information into the water system future demand scenarios.

OHM proposes to calculate 5-year, 10-year, and 20-year population and demand projections, which will not only incorporate US Census and SEMCOG population data but, most importantly, the results from stakeholder discussions and planning projections. While the City requested only 10-year and 20-year projections in the Water Distribution Plan and Model Update request for proposal (RFP), OHM recommends performing 5-year projections to satisfy EGLE ACT 399 requirements.



SEE SCOPE OF WORK TASK 3

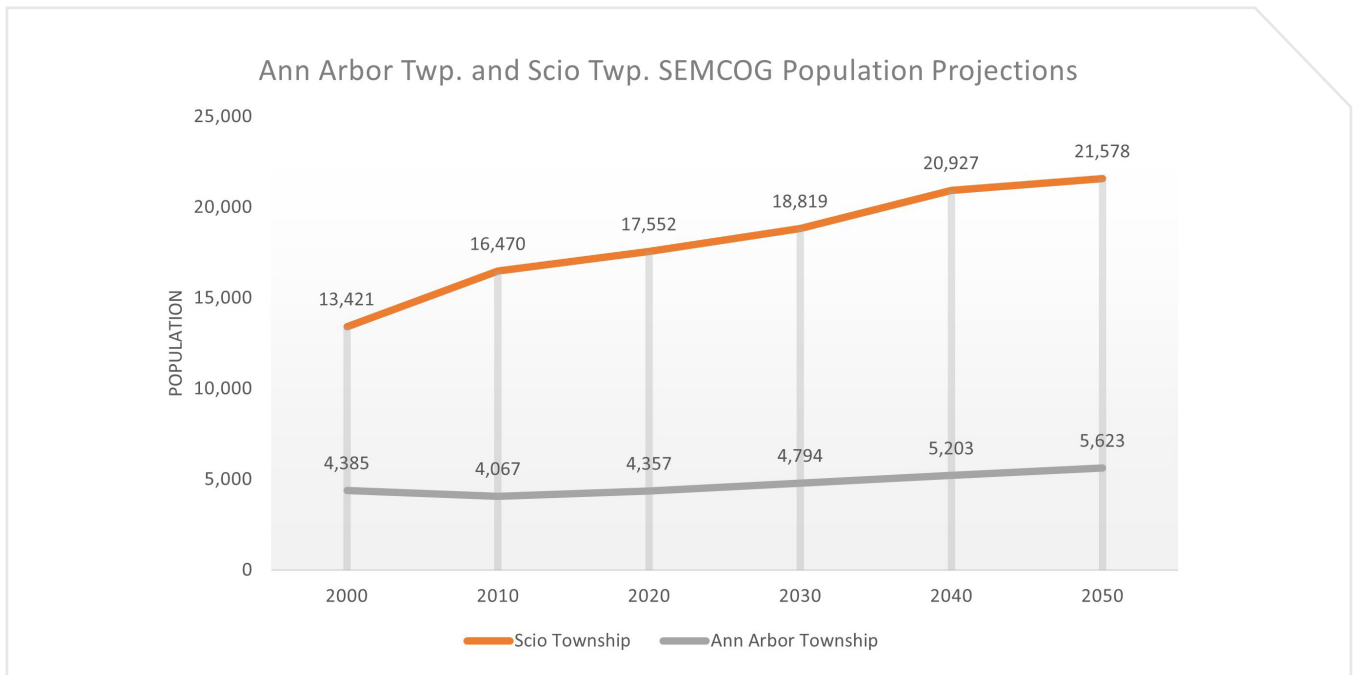
HYDRAULIC MODEL REFRESH

A hydraulic model can prove to be a very valuable asset to a community with its capability to assess the health of

a water system under different planning, operational, and emergency scenarios. A hydraulic model update includes the following four (4) key elements:

- Infrastructure Updates
- Operational Updates
- Model Calibration
- Baseline Demand Scenarios

Each one of these unique components interconnects to create a confident model. Therefore, having trust in each of these elements will result in a valuable model which can be used for system planning.



PROPOSED WORK PLAN CONTINUED...

 SEE SCOPE OF WORK SUBTASK 3A

Infrastructure & Operational Updates

Ideally, a water system model has a unique identifier that can establish a direct connection

between the model and the community’s GIS, ensuring a one-to-one link between the two. Having a model built this way allows for more efficient review, update, and analysis. It is OHM’s understanding that the City has invested heavily in their GIS and it is considered the ‘master’ database as information here can link to CityWorks, Capital Planning, and other critical asset management tools. It is also OHM’s understanding that the City has been able to proactively update their model as infrastructure improvements have been completed, but the model and GIS do not have a unique ID link. OHM has provided time and cost in the Scope of Work for a quality assurance and quality control (QA/QC) review, comparing the City GIS with the existing model to verify model’s accuracy as a representation of the water system.

Additionally, we’ve created Subtask 3D: Comprehensive Model (Optional) for a comprehensive model rebuild to establish a seamless one-to-one alignment between the City’s GIS and the model.

OHM proposes to provide a QA/QC of the vertical assets currently in the model with information gathered during Task 1: Project Initiation & Information Gathering to ensure they are accurately represented in the model. This includes the City’s pressure reducing valves (PRVs), booster stations, and storage tanks.



PROPOSED WORK PLAN CONTINUED...

One of the most important elements of a model update is capturing the unique operations of a system, including, but not limited to, closed valves, pump curves, control settings, operational logic, and winter vs. summer set-points. This information will be utilized to assign boundary conditions in the model. It is often the misunderstanding of system operations that lead to excessive troubleshooting during model calibration.

Through interviews with key personnel and review of information, OHM plans to collect all pertinent information for successful execution of this project and to create a knowledge hub that is pertinent for succession planning. Having a strong understanding of operations allows for the opportunity to understand areas where optimization of the system can be realized. Information that shall be collected, understood, and incorporated includes, but is not limited to, the following:

- Pump Controls & Operations
- Storage Tank Operating Levels (Summer vs. Winter) & Emergency Levels
- WTP Capacity & Firm Capacity
- PRV Settings
- Closed Valve Locations
- By-Pass Valve Locations & Status



SEE SCOPE OF WORK SUBTASK 3B

Model Calibration

Once the model is populated with the updated infrastructure data, operational data, and demand data OHM will begin the model calibration task. The City last calibrated their model as part of their 2010 Drinking Water Distribution Master Plan. Model calibration is a key component of a **Task 3: Hydraulic Model Refresh** because, once accomplished, it enables a confident evaluation of system hydraulics under different scenarios. Calibration will consist of the following subtasks:

- Field Testing – Hydrant Flow Testing & Pressure Monitoring
- Demand & Operational Analysis/Boundary Conditions (during hydrant testing)
- Model Troubleshooting

Hydrant and pressure monitoring field testing will be conducted as part of this task with support of City staff to operate hydrants. OHM will identify approximately 25 locations for hydrant testing. If a hydrant is identified as in-operable upon visit, OHM will provide approximately 5 additional locations which can be substituted. Water main age, diameter, material, and location will be considered when identifying testing locations. Historical hydrant testing data and operator input will be considered when determining the flow test locations to assess how the system has performed over time and to pinpoint areas of concern within the system.



PROPOSED WORK PLAN CONTINUED...

Approximately 50 tests from the City’s previous two (2) years of fire department hydrant flow tests will be reviewed. Ultimately, the hydrant test plan will provide a representative sample of the entire water system so that inferences can be made throughout. Pressure monitors will be placed at strategic locations throughout the system during hydrant testing. The data from the pressure monitors will be utilized during model calibration to ensure the model is accurately portraying the system, not just from a static snapshot, but also representative of the system over an extended timeframe.

It is important to understand the boundary conditions, including system demands, when establishing the calibration scenario in the hydraulic model. Prior to hydrant flow testing, the system PRV settings should be assessed, and information that is not trending in City SCADA data that would aid in model calibration should be identified. OHM anticipates that trending SCADA data is available to use as part of this task at the WTP, pump stations, and storage tanks. If trending data is not available to benefit the calibration process, OHM will strategically place the pressure monitors in locations to assist in troubleshooting conditions. If possible, it is recommended that the City calibrate their equipment, including flow meters and pressure gauges prior to this task.

Once the field data is collected, OHM will begin the calibration process. A calibration scenario will be created in the model that reflects the boundary and demand conditions during the field testing. The model will be analyzed and compared to the static and residual pressure at the measured flow rate recorded in the field. In addition, OHM will utilize the City’s historic hydrant flow test data and static pressure data to assist in the calibration effort. OHM will reasonably adjust system conditions, such as pipe roughness factor (C-Factor), water loss demand, and valve positions to satisfy calibration requirements. If calibration suggests a boundary condition, such as a closed valve or pressure setting is causing a calibration error, then OHM will coordinate with City staff to field verify conditions. As there are no universally accepted standards for hydraulic modeling calibration, and the degree of calibration depends on the anticipated use of the model. OHM will provide recommendations to the City for degree of calibration based on available guidelines.

 SEE SCOPE OF WORK SUBTASK 3C

Baseline Model Scenarios

Following model calibration, OHM will build the following model scenarios:

- Existing Average Day, Minimum Day, Maximum Day, and Peak Hour Demand Scenarios
- Future: 5-Year, 10-Year, and 20-Year Average Day, Minimum Day, Maximum Day, and Peak Hour Demand
- Existing Water Quality and Future Water Quality Scenarios

The future modeling conditions scenario will include full water distribution build out of Township island areas within the City limits, the proposed University of Michigan isolation vaults, and key stakeholders planning information. These scenarios will incorporate the demands calculated as part of *Task 2: Planning & Demand Projections*. Future demands will be allocated based on discussions with City stakeholders.



PROPOSED WORK PLAN CONTINUED...

OHM will utilize the Demand Allocation Manager in InfoWater Pro to allocate demands based on customer meter location. Diurnal patterns will be assigned to each location based on their customer type. Non-Revenue water will first be equally distributed throughout the model but will be refined during the model calibration phase as system hydraulics and operator input suggest. This will assist the City in areas to focus on for leak detection and potential replacement.

These scenarios will ultimately be used in *Task 4: Hydraulic Analysis* to assess the system's performance as it relates to EGLE regulatory requirements, the City's LOS goals, and internal requirements to determine if existing or future CIPs or operational changes are necessary.

Prior to assessing the water quality model in *Task 4: Hydraulic Analysis*, OHM will review the modeling results with City staff and utilize the City's bacteriological sampling data to validate the modeling results.



SEE SCOPE OF WORK TASK 4

HYDRAULIC ANALYSIS

Upon successful completion of *Task 3: Hydraulic Model Refresh* task, OHM will proceed with *Task 4: Hydraulic Analysis*. This critical task encompasses a comprehensive evaluation of the City's water distribution system, assessing its ability to meet both current regulatory requirements and future compliance expectations, as well as aligning with the City's internal LOS goals and standards. The analysis will assess the City's system and its response under both the existing and anticipated future demand scenarios. The following tasks will be completed:

- Hydraulic Performance Existing & Future
- Operational Optimization
- System Resiliency & Emergency Preparedness
- Hydraulic Model Training

The findings from *Task 4: Hydraulic Analysis* will directly inform the City's CIP. If deficiencies are identified in the existing and future hydraulic analysis, then CIP items or operational recommendations will be developed to counteract the deficiencies. Planned and proposed CIP items will be incorporated into the future conditions modeling and validated. This includes the following projects

- Proposed Isolation Vaults (2021 City of Ann Arbor/University of Michigan Water Connectivity Analysis)
- Full Township Island Build-Out
- UT-WS-14-04: Geddes Road Water Main Replacement
- UT-WS-18-33 and UT-WS-14-16: N Main St Water Main Replacement
- UT-WS-06-08: WTP: Pressure District Improvements
- UT-WS-18-05: Washington Heights/Arboretum Transmission Main Replacement

This is further discussed in *Task 6: Capital Improvement Planning* task.

PROPOSED WORK PLAN CONTINUED...

 SEE SCOPE OF WORK SUBTASK 4A

Hydraulic Performance Existing & Future

The City's hydraulic model will be analyzed for its hydraulic performance and ability to satisfy

regulatory requirements and internal LOS goals and standards under the existing and future demand and planning scenarios. The following regulatory and internal requirements will be referenced as it relates to this project:

- Act 399 and Recommended Standards for Water Works/10 State Standards (pressure and capacity of water works system)
- City of Ann Arbor Water Pressure Policy
- City of Ann Arbor 2015 Level of Service Goals
- City of Ann Arbor Fire Department Fire Flow Criteria

The City's rated capacity of the waterworks system, including capacity of the water source, treatment, storage tanks, pumping facilities, and equipment to maintain system reliability will be evaluated on its ability to satisfy both existing and future demands. The City's wholesale customers will be considered as part of this analysis and available system capacity will be estimated to assist the City in future customer agreement opportunities. It is anticipated that a detailed review of system source and treatment capacity was completed as part of the AECOM Water Treatment Plant Facility Plan which OHM proposes to reference and source as part of this Comprehensive Water Distribution Plan.

The City of Ann Arbor's updated hydraulic model will be utilized to assess and provide recommendations for the following:

- System Pressure
- System Fire Protection Capability
- City's Comprehensive Land Use Plan
- Water Main Consolidation Effort
- Public Services Standards Specifications Water Main Sizing
- City's Water Pressure Policy

The City's hydraulic model will be used to assess the system's ability to meet regulatory and internal pressure and fire protection requirements under each existing and future planning scenario. In addition, water age, which can be considered a surrogate for water quality, will be reviewed. If a deficiency is identified, OHM will document the deficiency and provide capital or operational recommendations that can be implemented to improve the system.



PROPOSED WORK PLAN CONTINUED...

 SEE SCOPE OF WORK SUBTASK 4B

Operational Optimization

Through hydraulic modeling and conversations with stakeholders, opportunities for operational optimization can be identified such as pressure zone redistricting, storage tank operational changes, and control setting changes. OHM proposes to first determine if an operational improvement can be made to improve any pressure, fire protection, or water age deficiencies that are identified during this task before identifying capital projects to do so. Operational improvements will be analyzed and vetted as part of this subtask. The following specific components will be assessed as part of this subtask:

- Water Age/Quality and Water Age Reduction Opportunities
 - Reservoir Turnover Improvements
- Uni-Direction Flushing Program Evaluation
- Pressure District Consolidation Evaluation (including reduced pressure zones)
- Permanent System Pressure Monitoring and District Metering
- Non-Revenue Water

 SEE SCOPE OF WORK SUBTASK 4C

System Resiliency & Emergency Preparedness

OHM has not only succeeded in guiding numerous communities through emergency water system situations but also in creating user-friendly and interactive operational contingency plans. These plans have proven to be an invaluable resource to communities to capture the operational steps necessary to counteract emergency scenarios and prevent long-term boil water advisories. The tool successfully captures system institutional knowledge and is easily updated as new information is available. As part of this sub-task, OHM proposes to complete the following:

- Review & Update the 2010 Emergency Planning Operations Recommendations
- Valve Criticality Analysis
- Single Point of Failure Analysis
- Develop Boil Water Advisory Guidance Material/Tools

OHM will assess the City’s model and meet with City staff and the City’s emergency management team to discuss critical valve locations, large-scale failure scenarios, and improvements to the 2010 emergency planning operations recommendations.

Our experts deliver proven water supply, treatment and distribution engineering services, applying new technologies at every turn. We’re passionate about water quality and help communities navigate contaminants and the issues that come with them—from understanding what they are and where they come from, to interpreting and implementing governmental regulations, to communicating with residents and stakeholders about treatment, safety and other mitigating efforts.



PROPOSED WORK PLAN CONTINUED...

OHM proposes to develop an online interactive tool that integrates the components of the system resiliency and emergency preparedness within this project. The tool will be available for use by City staff to proactively manage large system emergencies and identify customers within the system that will require boil water advisories. OHM anticipates approximately ten (10) scenarios will be assessed on an Average Day and Maximum Day Demand scenario, including the following:

- Loss of Barton Pump Station
- Gravity Reservoir Failure
- East HS/WS HS Failure
- Loss of Libert Pump Station
- Loss of North Campus Pump Station
- Loss of Fuller Glen Pup Station
- Loss of South Industrial Pump Station
- Key Transmission Main Failure

Additionally, this tool can serve as a hub that captures system institutional knowledge to aid in succession planning and can easily be updated as system information changes or more scenarios are identified by the City. OHM will prepare instructional materials and training to familiarize City staff on use of this tool.

 SEE SCOPE OF WORK SUBTASK 4D



 SCAN ME

InfoWater Pro Training

OHM’s proficiency in InfoWater Pro and hydraulic modeling, complemented by our internal training initiatives and participation in external training programs for InfoWater Pro, uniquely positions us to deliver high quality training to City staff. Our expertise not only ensures a comprehensive understanding of the software but also guarantees a wealth of knowledge regarding the location of publicly available training material (example via QR code). Our training would be catered to the individual staff members that are identified and the goals that are discussed during pre-training meetings.

 SEE SCOPE OF WORK TASK 5

ASSET MANAGEMENT PLAN (AMP)/PRIORITIZATION ACTION NUMBER (PAN)

As part of the City’s 2015 Water Distribution Level of Service & Capital Reinvestment Study project, the City developed LOS goals and a risk model that included the development of the Priority Action Number/PAN for their water system assets. OHM is currently integrating the City’s asset management data into Brightly Predictor and successfully assisted with this effort as part of the City’s storm and sanitary sewer asset management projects. These efforts have identified opportunities to refine and build on the PAN framework. Specifically, this project presents the opportunity to develop a risk model that can be degraded over time to simulate future risk and budget planning in addition to identifying current high-risk assets.



PROPOSED WORK PLAN CONTINUED...

Using information and insights from Task 1: Project Initiation & Information Gathering, Task 2: Demand Analysis, and Task 4: Hydraulic Analysis, OHM will review and update the City's large and critical user information. In addition, through Subtask 4C: System Resiliency & Emergency Preparedness, OHM will determine critical assets in terms of their hydraulic system benefits to be incorporated into the City's risk matrix.

In the Scope of Services, OHM has included Task 5B: PAN Software Replacement (Optional) to evaluate three (3) software applications to replace the current PAN model. As OHM is working through this integration with Brightly Predictor and identifying the limitations in the current PAN model as it relates to long-term system planning, we are well positioned to offer valuable recommendations to the City.

As part of this task conclusion, OHM will provide recommendations for a future LOS update effort. It is logical to perform this after the hydraulic analysis and towards the end of the project, as insights gained during this analysis can be factored into the recommendations.



SEE SCOPE OF WORK TASK 6

CAPITAL IMPROVEMENTS PLAN (CIP)

Water system CIP projects will consider hydraulic deficiencies identified during Task 4: Hydraulic Analysis, insights from Task 5 - AMP/PAN, and City-directed desired projects for 5-year, 10-year, and 20-year planning horizons. In addition, the planned water distribution projects in the City's existing CIP, which will be vetted as part of Task 4: Hydraulic Analysis will be incorporated as necessary. Capital projects will be prioritized according to their importance to the system, and when possible, alternative solutions will be explored. Planning level cost estimates will be provided for these projects. The City's CIP update will encompass and validate the following:

- Current CIP
- Pressure Deficiencies
- Fire Protection Deficiencies
- Water Quality Deficiencies
- Capacity Deficiencies
- Resilience Deficiencies
- *PAN Software (Optional)*
- Permanent Pressure Monitoring & District Metering

The City's CIP task also includes optional as-needed modeling support for a three (3) year period upon completion of this project.

PROPOSED WORK PLAN CONTINUED...

 SEE SCOPE OF WORK TASK 7

#PUBLICENGAGEMENT

The City continues to lead the way in transparency with its customers, prioritizing public engagement to enhance stakeholder comprehension and involvement in decision making. Since the City is not requesting an update to their 2015 LOS goals at this time, which necessitates in-depth stakeholder involvement, OHM's engagement strategy will be primarily revolve around educating the public on the importance of this project. OHM, with their expertise in drinking water systems and active involvement with AWWA on both the international and local levels, is well-equipped to adeptly convey public information safely and effectively.

OHM will collaborate with City staff to develop a Community Engagement Toolkit, a comprehensive resource that will provide information and tools to inform and educate stakeholders about this project. The development of a stakeholder list will be a collaborative effort with the City, enabling us to collectively strategize on the most effective means of delivering project information, recognizing the individual needs of each stakeholder. The results of this effort will serve as a guiding framework for the creation of educational and outreach materials. As previously mentioned, the materials generated will be focused on public education of this project, with the aim of ensuring that a diverse audience comprehends its significance. The materials generated will include language for the City's website, social media posts with images, and video. The content will address the projects process, outcomes, conclusions, recommendations, and potential impacts.

 SEE SCOPE OF WORK TASK 8

FINAL DELIVERABLES

OHM has provided two (2) options for the City of Ann Arbor to consider for final deliverable in the Scope of Work:

- *Subtask 8A: Updated Comprehensive Plan Report*
- *Subtask 8B: Updated Comprehensive Plan Dashboard*

With the ongoing advancements of technology and the increasing reliance on online platforms for information access through various software solutions, OHM is proposing the option to deliver the results and recommendations of this Comprehensive Water Distribution Plan via an online dashboard in lieu of a report.

Ultimately, the choice between an updated comprehensive plan report and a comprehensive plan dashboard hinge on the City's specific goals, the preferences to its stakeholders, and its broader technological and communication strategies.



Scope of Work

TASK 1: PROJECT INITIATION & INFORMATION GATHERING

Subtask 1A: Information Request & Review

OHM will perform a detailed desktop review of available background information associated with the City's water distribution system prior to initiating stakeholder interviews. Information that will be reviewed includes the following:

- Historical & Present City of Ann Arbor Drinking Water Studies (as detailed in Project Understanding)
- Relevant Drinking Water System Information/Data (as detailed in Project Understanding)
- Previous two (2) years of fire department hydrant flow test data.

Subtask 1B: Stakeholder Interviews & Workgroups

OHM anticipates organizing work groups with stakeholders, including staff from Public Works and the WTP as they are interconnected to certain aspects of this project. Interviews and workgroups will cover the following:



Interviews: Water Treatment Plant Operators, Fire Department, Public Works Unit, OSI, Planning Department, Emergency Management Team

Planning Workgroup: OSI, Planning Department, Public Works Unit, and Water Treatment Plant Operators

Emergency Services Workgroup: Emergency Management Team, Communication Office, Fire Department, Public Works Unit, and Water Treatment Plant Operators



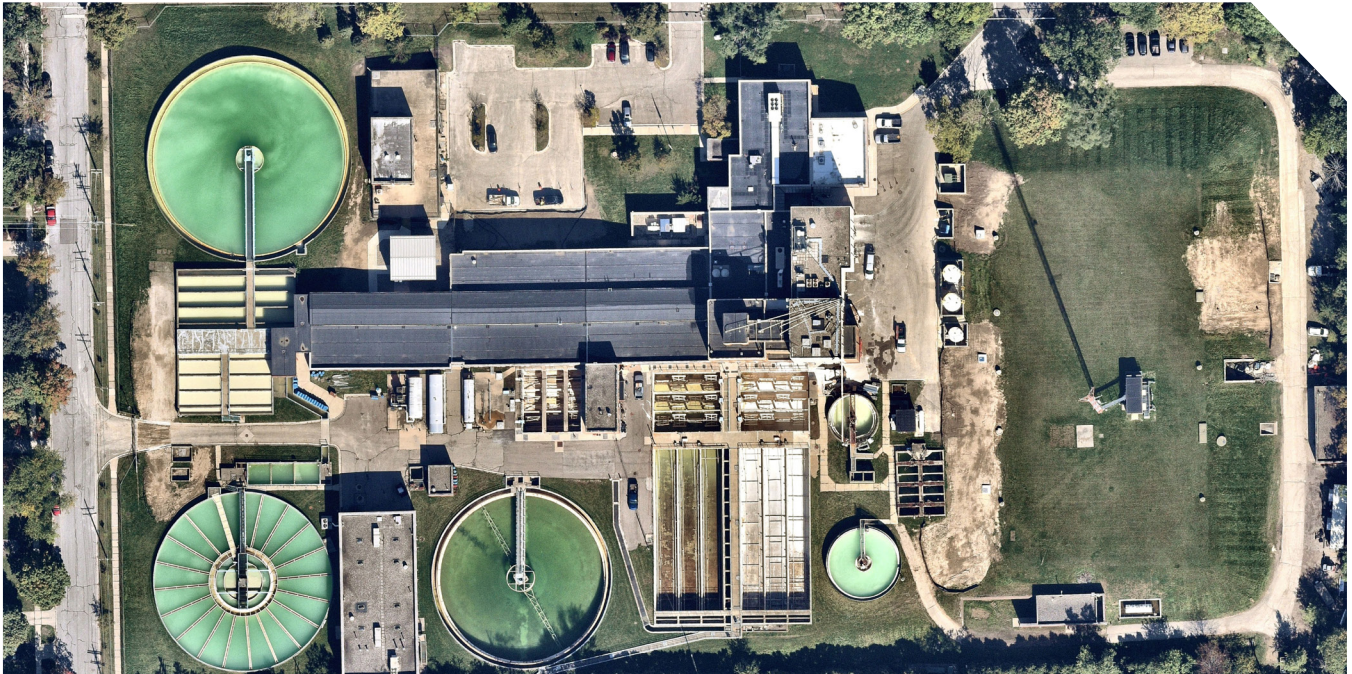
Stakeholders: University of Michigan, Ann Arbor Public Schools, Scio Township, Ann Arbor Township — Early in the project, initial interviews will be conducted to ensure that relevant discussion points are incorporated into their respective work efforts. Additionally, OHM anticipates ongoing communication with stakeholders throughout the project, as the successful outcome of this project will take a collaborative effort.

OHM Advisors' Deliverables

Operations Summary

Fire Protection Rate Criteria

Summary of Interviews & Workgroup Meeting



PROPOSED WORK PLAN CONTINUED...

TASK 2: PLANNING & DEMAND PROJECTIONS

Under this phase, OHM will establish the City’s existing average day, minimum day, maximum day, and peak hour demands for current and future planning scenarios. In addition, University of Michigan summer demand scenarios and the City’s minimum monthly demand scenario will be analyzed. This will include existing, 5-year (as required by Act 399), 10-year, and 20-year planning scenarios.

Task 2A: Planning Projections

Specific work efforts include:

- Incorporate internal stakeholders plans in the existing and future planning scenarios, including, but not limited to:
 - City of Ann Arbor Office of Sustainability & Innovations (OSI)
 - WTP Facility Plan
 - City of Ann Arbor’s Comprehensive Land Use Plan
 - City of Ann Arbor Planning Department
- Utilize and validate existing City Planning Department efforts related to the University of Michigan dorm expansions and West Stadium Boulevard growth for future planning scenarios.
- Incorporate external stakeholders’ plans in the existing and future planning scenarios, including, but not limited to:
 - University of Michigan
 - Ann Arbor Public Schools
 - Surrounding Townships (Scio Township & Ann Arbor Township)



PROPOSED WORK PLAN CONTINUED...

- Utilize US Census and SEMCOG population data to estimate existing, 5-year, 10-year, and 20-year populations to be serviced by the City’s water system.
- Finalize existing and future planning scenarios with the City to be used as a basis for demand projections.

Subtask 2B: Demand Projections

- Compile and summarize the following data to assist in existing and future demand projections:
 - WTP Production Data
 - Customer Meter Billing Data
 - 2019 (pre-covid) Model Data
 - Water Treatment Plant Facility Plan Data (AECOM)
 - SCADA Data
- Establish existing and future demand scenarios:
 - Average Day Demand
 - Maximum Day Demand
 - Minimum Day Demand
 - Peak Hour Deman
 - Water Quality Demand
 - University of Michigan Summer Demand
 - Low System Average Monthly Demand
- Identify large system users and their demands and unique hourly average diurnals.
- Develop hourly average diurnal patterns based on customer type.
- Calculate non-revenue water.

OHM Advisors’ Deliverables

Future Growth Plans (Internal and External)

Up To Three (3) Land Use Planning Scenarios

Existing & Future Population Projections

Existing & Future Demand Projections

Large System Users Demand Summary

Hourly Average Diurnals Based on Customer Type

Non-Revenue Water Summary

PROPOSED WORK PLAN CONTINUED...

TASK 3: HYDRAULIC MODEL REFRESH

As part of this phase of work, the City’s hydraulic model will be updated and recalibrated in InfoWater Pro for enhanced analysis and to assist in confident planning-level decisions. Specific work efforts include the following:

Subtask 3A: Infrastructure & Operational Updates

- Migrate current model from InfoWater 12.4 to InfoWater Pro.
- QA/QC existing model with City GIS Data.
- Update existing model with water system changes that were identified in the QA/QC review
- Assign elevation data to new locations in the model.
- Review and update vertical infrastructure in the model per findings from Project Initiation & Information Gathering task.
- Create GIS customer meter layer for demand distribution.
- Input operational criteria and control settings in the model per findings from the Project Initiation & Information Gathering task.

Subtask 3B: Model Calibration

- Develop a hydrant flow testing plan that identifies twenty-five (25) primary testing locations and five (5) alternate sites that provide a representative cross-section of the City’s water system.
 - Assess the City’s water system characteristics including factors such as pipe diameter, material, age, and geographical distribution.
 - Incorporate review of previous two (2) years of historical flow testing data for reference and analysis.
- Develop a pressure monitoring plan to be installed prior to hydrant flow testing.
- Assist City staff with collecting boundary condition data prior to field testing.
- Coordinate field testing schedule with City staff. It is anticipated that 5 to 7 days of field work will be required.
- Model calibration and troubleshooting through hydrant flow testing and pressure monitoring results.
- Water quality model validation through conversations with water treatment plant and public works unit staff and review of bacteriological sampling results.



PROPOSED WORK PLAN CONTINUED...

Subtask 3C: Baseline Model Scenarios

- Develop model scenarios for existing and future planning periods (5-year, 10-year, and 20-year planning periods):
 - Average day, minimum day, maximum day, and peak hour demands
 - Water Quality Scenarios:
 - University of Michigan summer demand scenario
 - City of Ann Arbor low monthly average demand scenario
- Incorporate City CIP items in future scenarios (proposed and planned) including:
 - Comprehensive land use plan for up to three land use scenarios
 - Proposed/future isolation vaults – 2021 City of Ann Arbor/U of M Water Connectivity Analysis
 - Full surrounding township island areas build-out, primarily Ann Arbor Township
 - City of Ann Arbor Water System CIPs
- Develop a model “read me” guide for internal City staff to utilize when running model.

OHM Advisors' Deliverables

Calibrated Updated InfoWater Pro Model W/Existing & Future Scenarios

Model Read-Me Guide

GIS Customer Meter/Demand Layer

Hydrant Flow Testing & Pressure Monitoring Plan

Subtask 3D: Comprehensive Model Rebuild (Optional)

It is OHM's understanding that a unique identifier does not exist between the City's model and their GIS data. If a one-to-one connection can't be identified during the model QA/QC process as part of Subtask 1A, then OHM will notify the City and potentially suggest a complete model rebuild.

OHM Advisors' Deliverables

Calibrated InfoWater Pro Model W/ Existing & Future Scenarios

Model Read-Me Guide

GIS Customer Meter/Demand Layer

Hydrant Flow Testing & Pressure Monitoring Plan

PROPOSED WORK PLAN CONTINUED...

TASK 4: HYDRAULIC ANALYSIS

Subtask 4A: Hydraulic Performance Existing & Future

- Clearly define distribution system goals to be utilized when identifying deficiencies.
- Perform up to three (3) land-use scenario assessments to be utilized by City Planning Department for the City's Comprehensive Land Use Plan effort and build-out timeline.
- Identify hydraulic deficiencies under existing and future demand planning scenarios as it relates to regulatory and internal standards.
 - Capacity of water source, treatment, storage tank, pumping facilities, and equipment.
 - Pressure
 - Fire Protection
- Assess and provide alternative improvement recommendations as necessary for the following existing planning items:
 - City's dual water main consolidation practice.
 - City's Public Services Standards Specifications water main sizing requirements.
 - City's Water Pressure Policy
 - City's current capital improvement plan for water distribution system projects.
- Incorporate and assess the following future planning items:
 - Full water distribution build-out for Township Island areas and future pressure zones
- Perform alternatives analysis for system pressure reduced valve(s) vs. individual house PRVs.
 - Proposed/future University of Michigan Isolation Vaults
- Conduct an evaluation of current wholesale customer agreements and future plans to assess the City's available capacity for future agreement opportunities.
- Develop an online/interactive fire protection map under the different demand scenarios to serve as guidance material for staff to efficiently identify abnormal flow tests and assist in system troubleshooting.



PROPOSED WORK PLAN CONTINUED...

OHM Advisors' Deliverables

Distribution System Defined Goals Summary

Land-Use Scenario Analysis Summary

Water System Deficiency Summary

Water Main Consolidation Practice Recommendation

Water Main Sizing Specification Recommendation & Alternatives

Water System Pressure Policy Update Recommendations

Existing Planned & Proposed CIP Validation

Full Township Island Area Build-Out Alternatives Analysis

Wholesale Customer Capacity Analysis

Interactive Fire Protection Guidance Map

Subtask 4B: Operational Optimization

- Evaluate existing pressure districts (including reduced pressure zones) and develop alternative(s) for consolidation of pressure districts.
- Assess water age scenarios to evaluate potential quality concerns and opportunities to reduce water age.
 - Engage with WTP staff to identify areas of known water quality concerns.
 - Assess reservoir turnover and operational improvement opportunities.
- Provide recommendations for permanent system pressure monitoring and district metering.
- Evaluate the need and areas of focus for a uni-directional flushing program from the water age analysis.
 - Develop an action plan for implementing a City program.

OHM Advisors' Deliverables

Pressure District Consolidation Summary

Water Age/Quality Analysis & Heat Map

Permanent Pressure Monitoring & District Metering Plans

Uni-Directional Focus Areas & Program Recommendations

PROPOSED WORK PLAN CONTINUED...

Subtask 4C: System Resiliency & Emergency Preparedness

- Review and update the 2010 Emergency Planning Operations Recommendations.
- Perform a valve criticality analysis through modeling and historical flow testing data to be utilized for future condition assessment.
- Perform a single point of failure analysis which identifies critical system assets that should be considered in system criticality analysis.
- Develop boil water advisory guidance material.
- Develop an online interactive emergency planning/contingency planning tool to guide City staff through large failure scenarios, including boil water advisory notices, for up to ten (10) scenarios.
 - Initial Suggested Scenarios: Loss of Barton Pump Station, Gravity Reservoir failure, East HS/West HS Failure, Loss of Liberty Pump Station, North Campus Pump Station failure, Fuller Glen Pump Station failure, South Industrial Pump Station failure, key transmission main failure.

OHM Advisors' Deliverables

System Resiliency & Emergency Preparedness Plan

Valve Criticality Analysis Summary

Single-Point Failure Hydraulic Analysis

Boil Water Advisory Guidance

Emergency Planning/Contingency Planning Tool

Subtask 4D: InfoWater Pro Training

- Organize an InfoWater Pro training event for up to four (4) City staff members.
- Develop a short training users-manual specific to the City's hydraulic model.
- Provide a resources sheet for City to utilize for hydraulic modeling.

OHM Advisors' Deliverables

City of Ann Arbor Hydraulic Model Users-Manual

InfoWater Pro Hydraulic Modeling Resources document





PROPOSED WORK PLAN **CONTINUED...**

**TASK 5: ASSET MANAGEMENT PLAN (AMP)
& PRIORITIZATION ACTION NUMBER (PAN)**

Subtask 5A: Risk Model Recommendations

- Review and update large user and critical users/assets as identified during the demand analysis and System Resiliency and Emergency Preparedness tasks.
- Provide recommendations on incorporation valve criticality analysis into future condition scores.
- Review overall pipe risk methodology and provide recommendations for updates.
- Provide recommendations for future level of service update effort based on outcomes of the hydraulic analysis task to determine feasibility.

Subtask 5B: PAN Software Replacement (Optional)

- *Evaluate three (3) software applications to replace the current PAN model.*
- *Develop a ranking system that discusses the pros/cons of each software application to allow for informed decisions making.*

PROPOSED WORK PLAN CONTINUED...

OHM Advisors' Deliverables

Roadmap for PAN Improvements

Critical Users/Large Users List

Future Level of Service Update Recommendations

Optional: Software Application Recommendations & Ranking System

TASK 6: CAPITAL IMPROVEMENT PLAN

A comprehensive CIP will be developed that incorporates recommendations from OHM's Hydraulic Analysis and AMP/PAN analysis and consolidates findings from prior distribution studies following a thorough validation process. This plan will encompass both short-term and long-term projects, prioritizing them based on their significance to system reliability. Alternatives will be vetted as appropriate. Planning level cost estimates will be provided for each CIP Item. Specific capital projects that will be considered include the following:

- Current Water Distribution Capital Improvement Plan Projects (as summarized in *Project & Task Understanding*)
- CIP Projects to address identified existing and future pressure, fire protection, capacity, and/or water quality deficiencies.
- Permanent System Pressure Monitoring and District Metering
- System PRVs vs. Individual House PRVs Island Area Buildout Analysis
- Reliability Improvements

OHM Advisors' Deliverables

Capital Improvement Plan (prioritization, alternatives, cost estimates)

Capital Improvement Plan GIS Map

Interactive Capital Improvement Plan Dashboard

TASK 7: PUBLIC ENGAGEMENT

Recognizing that information assessed and derived from this project may be considered sensitive and could potentially pose risks to the City's system, OHM's engagement strategy primarily focuses on educating the public on the necessity and purpose of a water distribution plan. Additionally, this approach is reinforced by the City's current focus on not requiring an extensive level of service update.



PROPOSED WORK PLAN CONTINUED...

It is anticipated that the strategy will be primarily focused on digital and social media materials that can effectively convey the project's process, outcomes, and impacts. To effectively engage interested stakeholders and communicate progress throughout the project, the key components of the public engagement strategy should include:

- Complete the City's Community Engagement Toolkit with City staff.
- Create Target Audience Lists: Develop a list of stakeholders, City staff, and media.
- Message Model: Identify the messages that must be communicated to ensure stakeholder participation, introduction to the project team's competencies, and project merits.
- Digital Media: Coordinate with the City to develop a project website that will provide a summary of the project and includes educational materials, updates, brief dashboards, and a summary video.
- Project Video: Produce a video that provides a high-level overview of the project and its results.
- Develop and assist with up to one (1) presentation to City Council.

OHM Advisors' Deliverables

Community Engagement Toolkit

Target Audience List

Message Model

Digital Media

Project Video (1)

City Council Presentation (1)

TASK 8: FINAL DELIVERABLES

As technology continues to advance, it opens a range of options for project deliverables, allowing OHM to create a resource that can be tailored uniquely to the owner's specific needs and preferences. OHM has proposed two deliverable options for the City's consideration: a traditional report deliverable and a digital dashboard deliverable. Each deliverable will effectively discuss the findings, results, and conclusions from the above outlined tasks.

PROPOSED WORK PLAN CONTINUED...

Subtask 8A: Updated Comprehensive Plan (Report)

As part of this task, a Comprehensive Water Distribution Plan will be developed to satisfy EGLE requirements and the requests from the City’s RFP. OHM will meet with the City to review the findings and recommendations from the report and incorporate their comments. The report will consolidate the outcomes and recommendations from each task item, providing a comprehensive resource for the City.

- Project Initiation & Information Gathering
- Planning & Demand Projections
- Hydraulic Model Refresh
- Hydraulic Analysis
- AMP & PAN
- Capital Improvement Plan
- Public Engagement

OHM Advisors’ Deliverables

Comprehensive Water Distribution Plan Report

Subtask 8B: Updated Comprehensive Plan Dashboard (Optional)

Like its report counterpart, the optional dashboard will contain chapters associated with the unique items from this study. It will be designed to be a centralized resource for the City, enabling easy access to critical information about the water distribution system. This interactive and visually engaging tool can be easily customized and provide immediate insights that are invaluable for effective succession planning. Given the dynamic nature of the City’s drinking water system and its continuous improvements, the dashboard ensures efficient and effortless updates. The dashboard will summarize the findings and recommendations from each task:

- *Project Initiation & Information Gathering*
- *Planning & Demand Projections*
- *Hydraulic Model Refresh*
- *Hydraulic Analysis*
- *AMP and PAN*
- *Capital Improvement Plan*
- *Public Engagement*

It should be noted that OHM has been in contact with EGLE and has received approval on providing Water Reliability Study and General Plan Updates for communities via a dashboard.

OHM Advisors’ Deliverables

Comprehensive Water Distribution Plan Dashboard

Dashboard Executive Summary



PROPOSED WORK PLAN CONTINUED...

TASK 9: AS-NEEDED MODELING SUPPORT (3) YEARS

This additional as-needed task will be used for as-needed modeling to support the City within its routine planning and model updating efforts. These may include items such as additional hydraulic model iterations and model updates to support capital planning and private development within the City. It is anticipated that this project will be completed toward the end 2025. OHM’s estimated rate schedule is included within the Fee Proposal for 2025 – 2028 during the course of the as-needed support timeline.

Resource Summary Table

Task & Area	OHM Advisors				City of Ann Arbor Staff								OHM Advisors' Key Staff
	Project Management	Water Resources and Asset Management	Capital Planning	Public Engagement	Systems Planning Eng.	Public Works Unit Staff	Water Treatment Unit Staff	Fire Department	Office of Sustainability & Innovations	Planning Department	Emergency Mgmt. Team	Communications Office	
A.	204	20	20	—	60	—	—	—	—	—	—	—	Susan Knepper, Robert Czachorski, George Tsakoff
B.	53	92	8	—	29	9	6	7	6	12	7	2	Susan Knepper, Isabelle Bester, Chris Elenbaas
C.	69	188	11	—	10	—	—	—	—	6	—	—	Susan Knepper, Isabelle Bester, Mackenzie Johnson
D.	72	368	8	—	11	38	6	1	—	—	—	—	Susan Knepper, Isabelle Bester, Mackenzie Johnson
E.	161	560	82	2	18	35	10	—	—	—	4	2	Susan Knepper, Isabelle Bester, Chris Elenbaas
F.	9	32	8	—	2	—	—	—	—	—	—	—	Isabelle Bester, Murat Ulasir, Chris Elenbaas
G.	25	84	44	—	10	—	—	—	—	—	—	—	Mackenzie Johnson, Matthew Kennedy, Chris Elenbaas
H.	37	—	—	70	11	—	—	—	—	—	—	4	Christine Spitzley, Susan Knepper
I.	76	196	40	—	2	2	—	—	—	—	—	—	Susan Knepper, Isabelle Bester, Chris Elenbaas



- A.** Project Management **B.** Project Initiation & Information Gathering
- C.** Planning & Demand Projections **D.** Hydraulic Model Refresh **E.** Hydraulic Analysis
- F.** AMP & PAN **G.** Capital Improvement Plan **H.** Public Engagement **I.** Final Deliverable



PROPOSED WORK PLAN CONTINUED...

Assumptions

- It is assumed that the City's GIS is updated and accurate and no updates are necessary by OHM.
- OHM did not include time for extensive model troubleshooting resulting from master database errors. In event such issues occur, OHM will promptly notify the City.
- The City can provide personnel to operate hydrants and valves during field testing.
- The City can provide OHM SCADA access and has trending data at key assets.

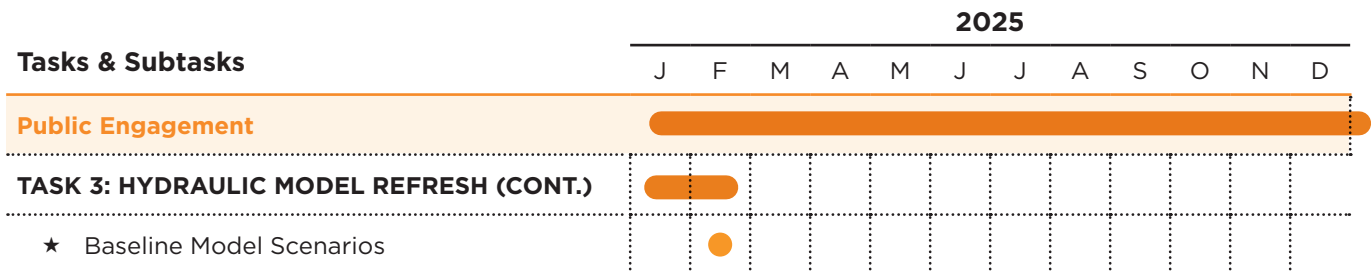
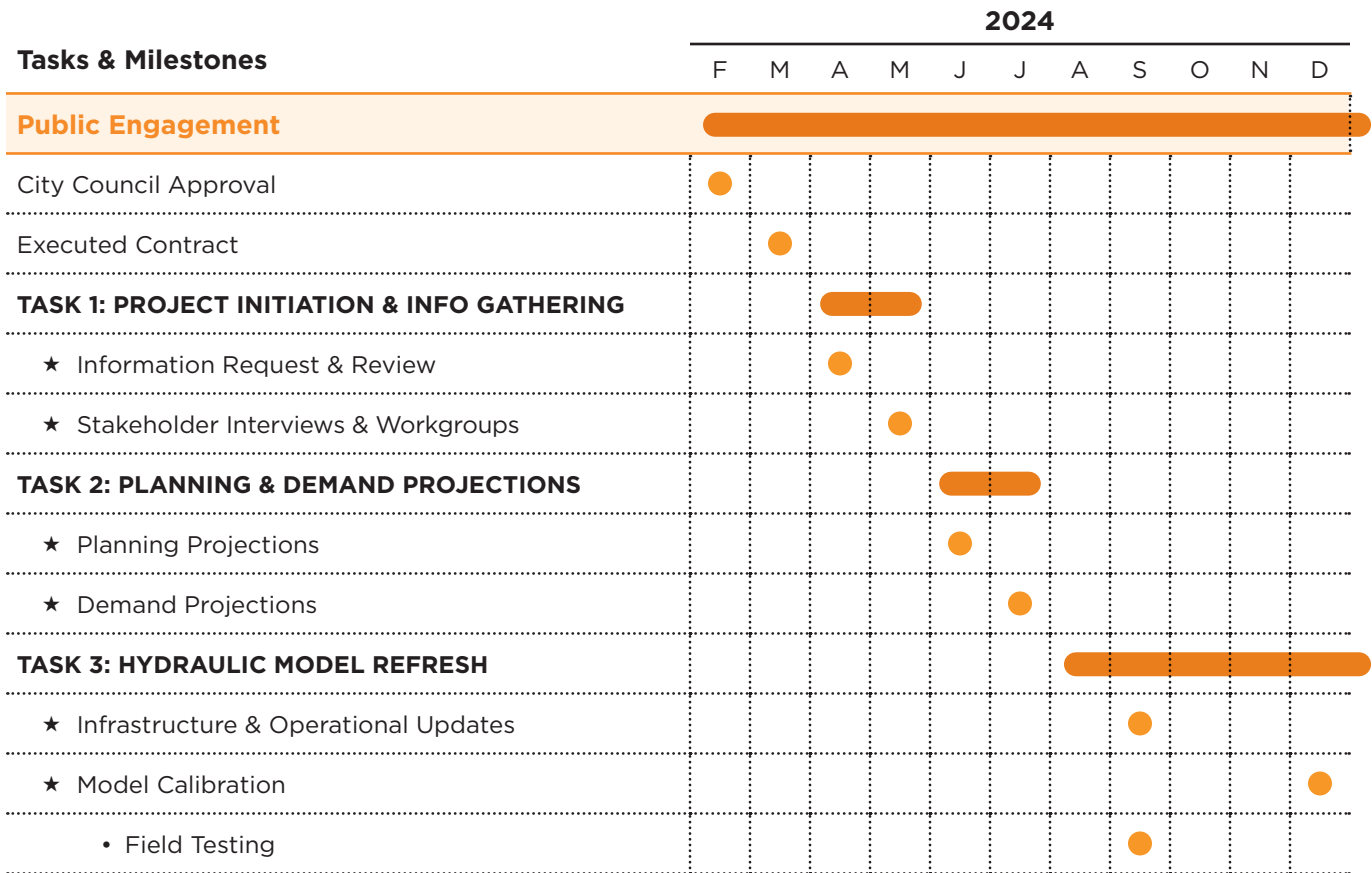
Schedule

Assuming City Council authorization in February 2024 and contact execution in March 2024, OHM is prepared to begin the Project Initiation and Information Gathering task beginning in April 2024. OHM proposes to submit the final deliverable to the City in November 2025 assuming timely responses and participation from connected stakeholders. It should be noted that this timeline may alter slightly if the City elects to proceed with the optional items OHM has provided. A more detailed schedule highlighting project milestones is summarized below.



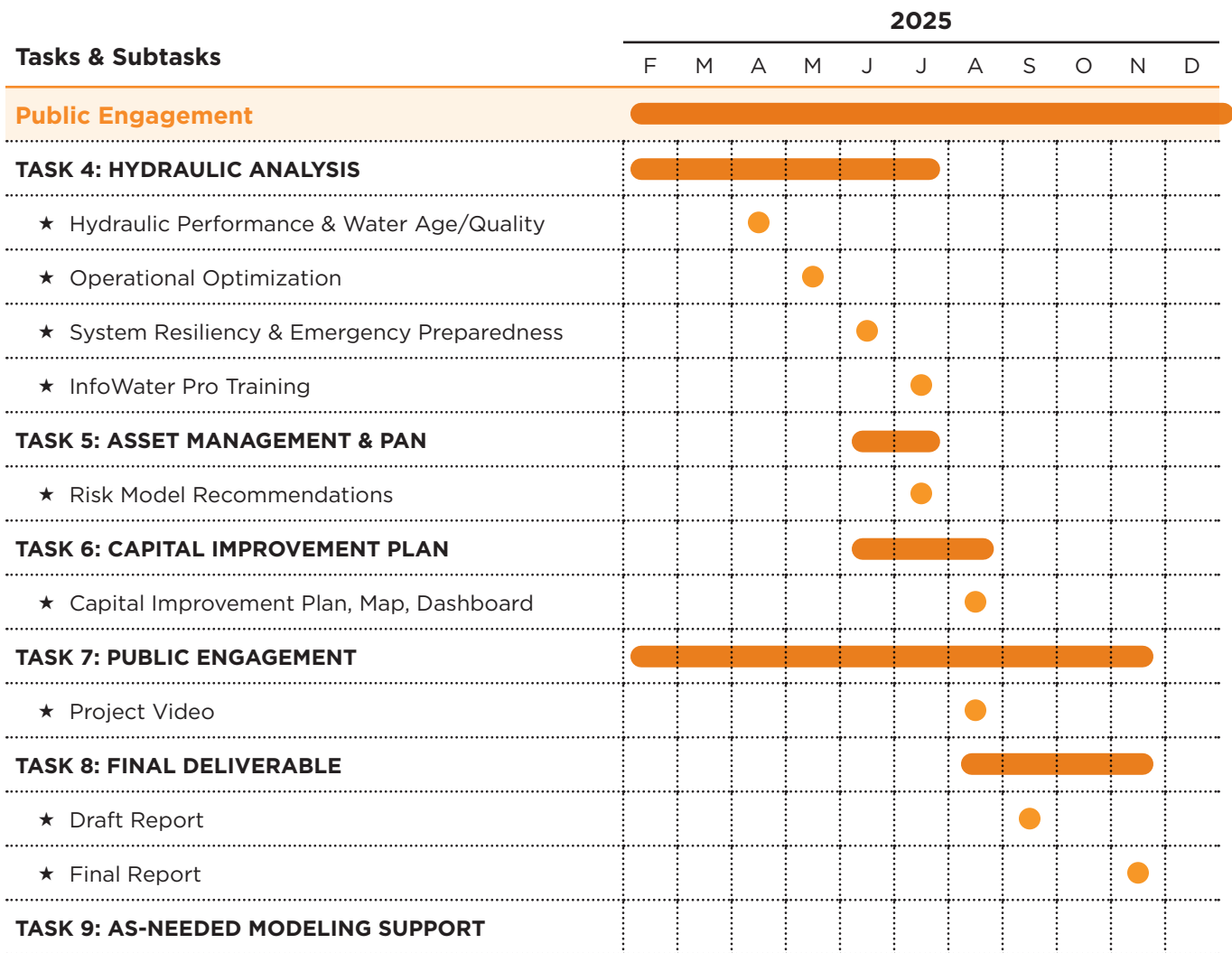
PROPOSED WORK PLAN CONTINUED...

Schedule (Cont.)



PROPOSED WORK PLAN CONTINUED...

Schedule (Cont.)



PROPOSED WORK PLAN CONTINUED...

Schedule (Cont.)

Tasks & Subtasks	2025	2026	2027	2028
Public Engagement	[Orange bar spanning 2025-2028]			
TASK 9: AS-NEEDED MODELING SUPPORT	[Orange bar 2025]	[Orange bar 2026]	[Orange bar 2027]	[Orange bar 2028]

Expedited Completion of Project Opportunities

If expedited completion of the project is desired, there are several potential steps that could be taken to condense the overall schedule. Potential steps that could be taken include:

- Coordinate early with the City to confirm vertical asset configuration within the model in lieu of waiting until after the model migration process.
- Coordinate with Customer Service to export water meter data to avoid time delays that may occur when pulling this data from the City’s AMI system.
- Given that 2024 will be a full Capital Improvement Plan refresh for the City, benefit could be gained by coordinating the risk model updates in advance of these CIP Planning efforts in the Fall of 2024. However, it is unlikely that the hydraulic modeling information would be available in advance of this effort.
- Have City perform master database updates to ensure no delays occur prior to project kickoff.
- If model rebuild option is not elected, OHM recommends that the City conduct an internal QA/QC on their hydraulic model to ensure it is updated prior to delivering it to OHM for this project.
- Have City perform calibration on their control and monitoring equipment prior to hydrant flow testing to ensure equipment is reporting accurately to reduce model/field troubleshooting time.
- Initiate early coordination with the City for gathering updated GIS information and historical hydrant flow testing information to design the hydrant flow and pressure monitoring plan. This may expedite the hydrant flow testing schedule and ultimate project timeline.

It should be noted, with *Chis Elenbaas*’ institutional knowledge of the City system, our estimated City effort is reduced from what we would otherwise anticipate being necessary without him on our project team. This, in turn, has contributed to a more expedited baseline project schedule.



SECTION D

Fee Proposal (Separate Envelope)



SECTION E

Authorized Negotiator

Authorized Negotiator

OUR LEADERSHIP

With 25 years' experience, George provides leadership for many of OHM Advisors municipal partners in southeast Michigan while overseeing a talented group of technical project managers across our southeast Michigan offices (including Ann Arbor and Livonia). As Principal / Authorized Negotiator, George's main role is to ensure that the City of Ann Arbor is provided with the highest degree of professional service on all projects we have with the City. George will contact the City occasionally throughout the duration of a project to ensure the City's expectations are being met. He is ultimately responsible for client satisfaction and project execution at the highest level.

WITH OHM ADVISORS SINCE 2013 | 15 YEARS PRIOR EXPERIENCE



George A. Tsakoff, PE

PRINCIPAL
& AUTHORIZED NEGOTIATOR

Education

Master of Science in Civil Engineering,
Wayne State University (2013)

Bachelor of Science in
Civil Engineering,
Michigan State University (1998)

Professional Registrations

Professional Engineer
State, #6201060848 (2013)

Northside Interceptor Condition Assessment; City of Ann Arbor (Ann Arbor, MI)

Project Manager for the preparation of contract documents related to the condition assessment of approximately 4 miles of 78-inch pipe from an upstream location near the U of M Hospital, downstream to the City wastewater treatment plant. The condition assessment included laser scanning and sonar by a Contractor to evaluate the structural and I/I condition of the interceptor along this route. Once the condition assessment was completed, OHM Advisors provided further analysis regarding the data.

DWRF Water Main Phase II HDD & Pipe Bursting; City of Livonia (Livonia, MI)

Engineering, design, permitting, DWRF Administrative coordination, and Specifications related to approximately nine miles of water main replacement within Sections 34 and 36 of the City. This water main replacement project is part of the DWRF funding for City of Livonia, and totals approximately \$9,000,000 in construction value. The project consists of the replacement of existing 6" water main with new 8" HDPE water main. A majority of the project will be constructed by the directional boring (horizontal drilling) method of installation to preserve surface features of the established neighborhoods and minimize overall disruption. Residential water services are being replaced as part of the project, as well as the installation of new gate valves and wells and hydrants.



Northville Hills Water District Optimization (5 Mile Road Booster Station Upgrades & GLWA Contract Reopener); Charter Township of Northville (Northville, MI)

Engineering analysis and design related to improvements to the existing Five Mile Road Booster Station. To reduce the peak water usage in the Northville Hills Water District, Northville Township retained OHM Advisors to provide analysis related to the existing booster station and elevated water tank to optimize their current operations and recommend future permanent improvements to the booster station to take full advantage of the GLWA exclusionary time period. This effort will allow the Township to ultimately reduce their contract value for peak hour flow from GLWA, and potentially save the Township over \$1,000,000 per year in water rate charges from GLWA as a wholesale customer.

As-needed Engineering; Task 1 Water Main Replacement (CS-1921B); DWSD (Detroit, MI)

Project Manager; The Task 1 water main project consists of more than 6 miles of water main replacement mainly within local neighborhoods in the city. A majority of the work is funded by a Michigan Drinking Water State Revolving Fund (DWSRF) loan. The current Task 6 water main replacement design project is similar in that it consists of replacement or rehabilitation of approximately 6 miles of water main in the Dexter-Linwood, Davison, and Buffalo-Charles neighborhoods of the city. This task is also funded through DWSRF, with design efforts expected to be completed in December of 2023. OHM Advisors will assist with preparation of construction drawings, Book 2 specifications, opinion of probable costs at various stages of design, and preparation of documentation and clearances needed to satisfy DWRSF requirements.

Novi Wastewater Asset Management Plan & Stormwater Master Plan; City of Novi (Novi, MI)

Assisted with preparing proposed work plan/scope of work and cost estimates for projects' grant applications to the Michigan's Stormwater, Asset Management and Wastewater (SAW) Program.

5 Mile & Ridge Road Water Main Extension (Northville Township, MI)

Principal; Developed design documents and provided contract administration for the construction of 8,800 feet of new 16-inch and 12-inch water main. The new water main will primarily be installed by horizontal directional drill (HDD) to minimize environmental impacts to sensitive wetlands and a major stream crossing along the proposed route. Included extensive stakeholder coordination including a CSX Railroad crossing, high pressure gas main crossing, stream crossing and extensive wetlands.

Booster Station & PRV Improvements (Northville, MI)

Principal; Analysis, engineering and design was authorized in late summer of 2023 to remove the existing water ground storage tank from the City water system and design a new booster station along with multiple new PRV's to provide a more efficient and robust water system. The basis of design will continue through the fall and winter months into 2024 with design and bidding documents prepared in late 2024 for 2025 construction.

Fuller Street Emergency Culvert Replacement; City of Ann Arbor (Ann Arbor, MI)

Principal for the analysis, design, bidding, and contract administration for an emergency project with City of Ann Arbor, MDOT Office of Rail, and Amtrack, and additional permitting coordination through EGLE for floodplain impact to the Huron River. The new culvert consisted of approximately 82 feet of 60-inch RCP along with two new 96-inch diameter structures. At the upstream end of the project, 8 feet of 48-inch RCP was installed to accommodate a closure pour between the proposed 96-inch structure and an immediately upstream existing stormwater vault. The slope adjacent to Fuller Street was reconstructed and stabilized with restoration and the entire work site including the railroad track ballast was replaced, concluding with improvements to the outlet of the culvert at the Huron River for heavy rip rap and strategic modification of the outlet elevation at the river.



SECTION F

Required Forms & Attachments

**ATTACHMENT B
LEGAL STATUS OF OFFEROR**

(The Respondent shall fill out the provision and strike out the remaining ones.)

The Respondent is:

- A corporation organized and doing business under the laws of the state of MICHIGAN, for whom GEORGE TSAKOFF bearing the office title of PRINCIPAL, whose signature is affixed to this proposal, is authorized to execute contracts on behalf of respondent.*

*If not incorporated in Michigan, please attach the corporation's Certificate of Authority

- ~~• A limited liability company doing business under the laws of the State of _____, whom _____ bearing the title of _____ whose signature is affixed to this proposal, is authorized to execute contract on behalf of the LLC.~~
- ~~• A partnership organized under the laws of the State of _____ and filed with the County of _____, whose members are (attach list including street and mailing address for each.)~~
- ~~• An individual, whose signature with address, is affixed to this RFP.~~

Respondent has examined the basic requirements of this RFP and its scope of services, including all Addendum (if applicable) and hereby agrees to offer the services as specified in the RFP.

George A Tsakoff

Date: 11/1/2023,

Signature

(Print) Name GEORGE A. TSAKOFF, PE Title PRINCIPAL

Firm: ORCHARD, HILTZ & MCCLIMENT, INC. (DBA OHM ADVISORS)

Address: 355 SOUTH ZEEB ROAD, SUITE A, ANN ARBOR, MI 48103

Contact Phone C (734) 495-9568, O (734) 466-4439 Fax (734) 522-6427

Email GEORGE.TSAKOFF@OHM-ADVISORS.COM



**ATTACHMENT C
CITY OF ANN ARBOR DECLARATION OF COMPLIANCE**

Non-Discrimination Ordinance

The "non discrimination by city contractors" provision of the City of Ann Arbor Non-Discrimination Ordinance (Ann Arbor City Code Chapter 112, Section 9:158) requires all contractors proposing to do business with the City to treat employees in a manner which provides equal employment opportunity and does not discriminate against any of their employees, any City employee working with them, or any applicant for employment on the basis of actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight. It also requires that the contractors include a similar provision in all subcontracts that they execute for City work or programs.

In addition the City Non-Discrimination Ordinance requires that all contractors proposing to do business with the City of Ann Arbor must satisfy the contract compliance administrative policy adopted by the City Administrator. A copy of that policy may be obtained from the Purchasing Manager

The Contractor agrees:

- (a) To comply with the terms of the City of Ann Arbor's Non-Discrimination Ordinance and contract compliance administrative policy.
- (b) To post the City of Ann Arbor's Non-Discrimination Ordinance Notice in every work place or other location in which employees or other persons are contracted to provide services under a contract with the City.
- (c) To provide documentation within the specified time frame in connection with any workforce verification, compliance review or complaint investigation.
- (d) To permit access to employees and work sites to City representatives for the purposes of monitoring compliance, or investigating complaints of non-compliance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services in accordance with the terms of the Ann Arbor Non-Discrimination Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Non-Discrimination Ordinance, obligates the Contractor to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract.

ORCHARD, HILTZ & MCCLIMENT, INC. (DBA OHM ADVISORS)
Company Name
George A Tsakoff 11/1/2023
Signature of Authorized Representative Date

GEORGE A. TSAKOFF, PE, PRINCIPAL
Print Name and Title

355 SOUTH ZEEB ROAD, SUITE A ANN ARBOR, MI 48103
Address, City, State, Zip

C (734) 495-9568, O (734) 466-4439, E GEORGE.TSAKOFF@OHM-ADVISORS.COM
Phone/Email address

Questions about the Notice or the City Administrative Policy, Please contact:
Procurement Office of the City of Ann Arbor
(734) 794-6500

Revised 3/31/15 Rev. 0

NDO-2

**ATTACHMENT D
CITY OF ANN ARBOR
LIVING WAGE ORDINANCE DECLARATION OF COMPLIANCE**

The Ann Arbor Living Wage Ordinance (Section 1:811-1:821 of Chapter 23 of Title I of the Code) requires that an employer who is (a) a contractor providing services to or for the City for a value greater than \$10,000 for any twelve-month contract term, or (b) a recipient of federal, state, or local grant funding administered by the City for a value greater than \$10,000, or (c) a recipient of financial assistance awarded by the City for a value greater than \$10,000, shall pay its employees a prescribed minimum level of compensation (i.e., Living Wage) for the time those employees perform work on the contract or in connection with the grant or financial assistance. The Living Wage must be paid to these employees for the length of the contract/program.

Companies employing fewer than 5 persons and non-profits employing fewer than 10 persons are exempt from compliance with the Living Wage Ordinance. If this exemption applies to your company/non-profit agency please check here No. of employees _____

The Contractor or Grantee agrees:

- (a) To pay each of its employees whose wage level is not required to comply with federal, state or local prevailing wage law, for work covered or funded by a contract with or grant from the City, no less than the Living Wage. The current Living Wage is defined as \$15.90/hour for those employers that provide employee health care (as defined in the Ordinance at Section 1:815 Sec. 1 (a)), or no less than \$17.73/hour for those employers that do not provide health care. The Contractor or Grantor understands that the Living Wage is adjusted and established annually on April 30 in accordance with the Ordinance and covered employers shall be required to pay the adjusted amount thereafter to be in compliance with Section 1:815(3).

Check the applicable box below which applies to your workforce	
<input type="checkbox"/>	Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage without health benefits
<input checked="" type="checkbox"/>	Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage with health benefits

- (b) To post a notice approved by the City regarding the applicability of the Living Wage Ordinance in every work place or other location in which employees or other persons contracting for employment are working.
- (c) To provide to the City payroll records or other documentation within ten (10) business days from the receipt of a request by the City.
- (d) To permit access to work sites to City representatives for the purposes of monitoring compliance, and investigating complaints or non-compliance.
- (e) To take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee covered by the Living Wage Ordinance or any person contracted for employment and covered by the Living Wage Ordinance in order to pay the living wage required by the Living Wage Ordinance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services or agrees to accept financial assistance in accordance with the terms of the Living Wage Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Living Wage Ordinance, obligates the Employer/Grantee to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract or grant of financial assistance.

ORCHARD, HILTZ & MCCLIMENT, INC. (DBA OHM ADVISORS)	355 SOUTH ZEEB ROAD, SUITE A
Company Name	Street Address
	ANN ARBOR, MI 48103
Signature of Authorized Representative	City, State, Zip
GEORGE A. TSAKOFF, PE, PRINCIPAL	C (734) 495-9568, O (734) 466-4439
Print Name and Title	Phone/Email address

City of Ann Arbor Procurement Office, 734/794-6500, procurement@a2gov.org Rev. 3/7/23





ATTACHMENT E

VENDOR CONFLICT OF INTEREST DISCLOSURE FORM

All vendors interested in conducting business with the City of Ann Arbor must complete and return the Vendor Conflict of Interest Disclosure Form in order to be eligible to be awarded a contract. Please note that all vendors are subject to comply with the City of Ann Arbor's conflict of interest policies as stated within the certification section below.

If a vendor has a relationship with a City of Ann Arbor official or employee, an immediate family member of a City of Ann Arbor official or employee, the vendor shall disclose the information required below.

1. No City official or employee or City employee's immediate family member has an ownership interest in vendor's company or is deriving personal financial gain from this contract.
2. No retired or separated City official or employee who has been retired or separated from the City for less than one (1) year has an ownership interest in vendor's Company.
3. No City employee is contemporaneously employed or prospectively to be employed with the vendor.
4. Vendor hereby declares it has not and will not provide gifts or hospitality of any dollar value or any other gratuities to any City employee or elected official to obtain or maintain a contract.
5. Please note any exceptions below:

Conflict of Interest Disclosure*	
Name of City of Ann Arbor employees, elected officials or immediate family members with whom there may be a potential conflict of interest.	<input type="checkbox"/> Relationship to employee <input type="checkbox"/> Interest in vendor's company <input type="checkbox"/> Other (please describe in box below)
OHM ADVISORS HAS NO CONFLICTS OF INTEREST.	

*Disclosing a potential conflict of interest does not disqualify vendors. In the event vendors do not disclose potential conflicts of interest and they are detected by the City, vendor will be exempt from doing business with the City.

I certify that this Conflict of Interest Disclosure has been examined by me and that its contents are true and correct to my knowledge and belief and I have the authority to so certify on behalf of the Vendor by my signature below:		
ORCHARD, HILTZ & MCCLIMENT, INC. (DBA OHM ADVISORS)	C (734) 495-9568, O (734) 466-4439	
Vendor Name	Vendor Phone Number	
<i>George A Tsakoff</i>	11/1/2023	GEORGE A. TSAKOFF, PE, PRINCIPAL
Signature of Vendor Authorized Representative	Date	Printed Name of Vendor Authorized Representative

Questions about this form? Contact Procurement Office City of Ann Arbor Phone: 734/794-6500, procurement@a2gov.org

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

**Give Form to the
requester. Do not
send to the IRS.**

▶ Go to www.irs.gov/FormW9 for instructions and the latest information.

Print or type.
See Specific Instructions on page 3.

<p>1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.</p> <p>Orchard, Hiltz & McCliment. Inc.</p>	
<p>2 Business name/disregarded entity name, if different from above</p> <p>OHM Advisors</p>	
<p>3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.</p> <p><input type="checkbox"/> Individual/sole proprietor or single-member LLC</p> <p><input checked="" type="checkbox"/> C Corporation</p> <p><input type="checkbox"/> S Corporation</p> <p><input type="checkbox"/> Partnership</p> <p><input type="checkbox"/> Trust/estate</p> <p><input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____</p> <p>Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.</p> <p><input type="checkbox"/> Other (see instructions) ▶ _____</p>	<p>4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):</p> <p>Exempt payee code (if any) _____</p> <p>Exemption from FATCA reporting code (if any) _____</p> <p><small>(Applies to accounts maintained outside the U.S.)</small></p>
<p>5 Address (number, street, and apt. or suite no.) See instructions.</p> <p>34000 Plymouth Rd</p> <p>6 City, state, and ZIP code</p> <p>Livonia, MI 48150</p>	<p>Requester's name and address (optional)</p>
<p>7 List account number(s) here (optional)</p>	

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number									
-				-					
or									
Employer identification number									
3	8	-	1	6	9	1	3	2	3

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here	Signature of U.S. person ▶ <i>Mark McComb</i>	Date ▶
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General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
 - Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
 - Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
 - Form 1099-S (proceeds from real estate transactions)
 - Form 1099-K (merchant card and third party network transactions)
 - Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
 - Form 1099-C (canceled debt)
 - Form 1099-A (acquisition or abandonment of secured property)
- Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.
- If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.*

