PROFESSIONAL SERVICES AGREEMENT BETWEEN
AECOM Great Lakes Inc. (AECOM)
AND THE CITY OF ANN ARBOR
FOR Water Treatment Plant (WTP) Facility Plan 2022

This agreement ("Agreement") is between the City of Ann Arbor, a Michigan municipal corporation, having its offices at 301 E. Huron St. Ann Arbor, Michigan 48104 ("City"), and AECOM Great Lakes Inc. (AECOM) ("Contractor"), a(n) Michigan Corporation, with its address at 40600 ANN ARBOR RD E STE 201 PLYMOUTH MI 48170. City and Contractor are referred to collectively herein as the "Parties." The Parties agree as follows:

I. DEFINITIONS

Administering Service Area/Unit means Water Treatment Services Unit .

Contract Administrator means Senior Utilities Engineer , acting personally or through any assistants authorized by the Administrator/Manager of the Administering Service Area/Unit.

Supervising Professional means the person acting under the authorization of the manager of the Administering Service Area/Unit. At the time this Agreement is executed, the Supervising Professional is: Ms. Quirien Muylwyk whose job title is Americas Practice Director for Water Quality. If there is any question concerning who the Supervising Professional is, Contractor shall confirm with the manager of the Administering Service Area/Unit.

Deliverables means all Plans, Specifications, Reports, Calculations, Presentations, Recommendations, and other materials developed for and delivered to City by Contractor under this Agreement.

Project means Water Treatment Plant (WTP) Facility Plan 2022

II. DURATION

Contractor shall commence performance on _____, 2022 ("Commencement Date"). This Agreement shall remain in effect until satisfactory completion of the Services specified below unless terminated as provided for in Article XI. The terms and conditions of this Agreement shall apply to the earlier of the Effective Date or Commencement Date.

III. SERVICES

A. The Contractor agrees to provide Professional Engineering Services ("Services") in connection with the Project as described in Exhibit A. The City retains the right to make changes to the quantities of service within the general scope of the Agreement at any time by a written order. If the changes add to or deduct from the extent of the services, the compensation shall be adjusted accordingly. All such changes shall be executed under the conditions of the original Agreement.

B. Quality of Services under this Agreement shall be of the level of quality performed

by persons regularly rendering this type of service. Determination of acceptable quality shall be made solely by the Contract Administrator.

C. The Contractor shall perform its Services for the Project in compliance with all statutory, regulatory, and contractual requirements now or hereafter in effect as may be applicable to the rights and obligations set forth in the Agreement. The Contractor shall also comply with and be subject to the City of Ann Arbor policies applicable to independent contractors.

D. The Contractor may rely upon the accuracy of reports and surveys provided to it by the City (if any) except when defects should have been apparent to a reasonably competent professional or when it has actual notice of any defects in the reports and surveys.

IV. INDEPENDENT CONTRACTOR

The Parties agree that at all times and for all purposes under the terms of this Agreement each Party's relationship to any other Party shall be that of an independent contractor. Each Party will be solely responsible for the acts of its own employees, agents, and servants. No liability, right, or benefit arising out of any employer/employee relationship, either express or implied, shall arise or accrue to any Party as a result of this Agreement.

Contractor does not have any authority to execute any contract or agreement on behalf of the City, and is not granted any authority to assume or create any obligation or liability on the City's behalf, or to bind the City in any way.

V. COMPENSATION OF CONTRACTOR

A. The Contractor shall be paid in the manner set forth in Exhibit B. Payment shall be made monthly, unless another payment term is specified in Exhibit B, following receipt of invoices submitted by the Contractor, and approved by the Contract Administrator.

B. The Contractor will be compensated for Services performed in addition to the Services described in Article III, only when the scope of and compensation for those additional Services have received prior written approval of the Contract Administrator.

C. The Contractor shall keep complete records of work performed (e.g. tasks performed, hours allocated, etc.) so that the City may verify invoices submitted by the Contractor. Such records shall be made available to the City upon request and submitted in summary form with each invoice.

VI. INSURANCE/INDEMNIFICATION

A. The Contractor shall procure and maintain from the Effective Date or Commencement Date of this Agreement (whichever is earlier) through the conclusion of this Agreement, such insurance policies, including those set forth in Exhibit C and D, as will protect itself and the City from all claims for bodily injuries, death or property damage that may arise under this Agreement; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor, any subcontractor, or anyone employed by them directly or indirectly. Prior to commencement of work under this Agreement, Contractor shall provide to the City documentation satisfactory to the City, through City-approved means (currently myCOI), demonstrating it has obtained the policies and endorsements required by Exhibit C. Contractor shall add registration@mycoitracking.com to its safe sender's list so that it will receive necessary communication from myCOI. When requested, Contractor shall provide the same documentation for its subcontractor(s) (if any).

B. Any insurance provider of Contractor shall be authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-authorized insurance companies are not acceptable unless approved in writing by the City.

C. To the fullest extent permitted by law, Contractor shall indemnify, defend, and hold the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses, including attorney's fees, resulting or alleged to result, from any acts or omissions by Contractor or its employees and agents occurring in the performance of or breach in this Agreement, except to the extent that any suit, claim, judgment or expense are finally judicially determined to have resulted from the City's negligence or willful misconduct or its failure to comply with any of its material obligations set forth in this Agreement.

VII. COMPLIANCE REQUIREMENTS

A. Nondiscrimination. The Contractor agrees to comply, and to require its subcontractor(s) to comply, with the nondiscrimination provisions of MCL 37.2209. The Contractor further agrees to comply with the provisions of Section 9:158 of Chapter 112 of the Ann Arbor City Code and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity.

B. Living Wage. If the Contractor is a "covered employer" as defined in Chapter 23 of the Ann Arbor City Code, the Contractor agrees to comply with the living wage provisions of Chapter 23 of the Ann Arbor City Code. The Contractor agrees to pay those employees providing Services to the City under this Agreement a "living wage," as defined in Section 1:815 of the Ann Arbor City Code, as adjusted in accordance with Section 1:815(3); to post a notice approved by the City of the applicability of Chapter 23 in every location in which regular or contract employees providing services under this Agreement are working; to maintain records of compliance; if requested by the City, to provide documentation to verify compliance; to take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee or person contracted for employment in order to pay the living wage required by Section 1:815; and otherwise to comply with the requirements of Chapter 23.

VIII. WARRANTIES BY THE CONTRACTOR

A. The Contractor warrants that the quality of its Services under this Agreement shall conform to the level of quality performed by persons regularly rendering this type of service.

B. The Contractor warrants that it has all the skills, experience, and professional licenses (if applicable) necessary to perform the Services pursuant to this Agreement.

C. The Contractor warrants that it has available, or will engage, at its own expense, sufficient trained employees to provide the Services pursuant to this Agreement.

D. The Contractor warrants that it has no personal or financial interest in the Project other than the fee it is to receive under this Agreement. The Contractor further certifies that it shall not acquire any such interest, direct or indirect, which would conflict in any manner with the performance of the Services it is to provide pursuant to this Agreement. Further Contractor agrees and certifies that it does not and will not employ or engage any person with a personal or financial interest in this Agreement.

E. The Contractor warrants that it is not, and shall not become overdue or in default to the City for any contract, debt, or any other obligation to the City including real and personal property taxes. Further Contractor agrees that the City shall have the right to set off any such debt against compensation awarded for Services under this Agreement.

F. The Contractor warrants that its proposal for services was made in good faith, it arrived at the costs of its proposal independently, without consultation, communication or agreement, for the purpose of restricting completion as to any matter relating to such fees with any competitor for these Services; and no attempt has been made or shall be made by the Contractor to induce any other person or firm to submit or not to submit a proposal for the purpose of restricting competition.

G. The person signing this Agreement on behalf of Contractor represents and warrants that she/he has express authority to sign this Agreement for Contractor and agrees to hold the City harmless for any costs or consequences of the absence of actual authority to sign.

IX. OBLIGATIONS OF THE CITY

A. The City agrees to give the Contractor access to the Project area and other City-owned properties as required to perform the necessary Services under this Agreement.

B. The City shall notify the Contractor of any defects in the Services of which the Contract Administrator has actual notice.

X. ASSIGNMENT

A. The Contractor shall not subcontract or assign any portion of any right or obligation under this Agreement without prior written consent from the City. Notwithstanding any consent by the City to any assignment, Contractor shall at all times remain bound to all warranties, certifications, indemnifications, promises and performances, however described, as are required of it under the Agreement unless specifically released from the requirement, in writing, by the City.

B. The Contractor shall retain the right to pledge payment(s) due and payable under this Agreement to third parties.

XI. TERMINATION OF AGREEMENT

A. If either party is in breach of this Agreement for a period of fifteen (15) days following receipt of notice from the non-breaching party with respect to a breach, the non-breaching party may pursue any remedies available to it against the breaching party under applicable law, including but not limited to, the right to terminate this Agreement without further notice. The waiver of any breach by any party to this Agreement shall not waive any subsequent breach by any party.

B. The City may terminate this Agreement, on at least thirty (30) days advance notice, for any reason, including convenience, without incurring any penalty, expense or liability to Contractor, except the obligation to pay for Services actually performed under the Agreement before the termination date.

C. Contractor acknowledges that, if this Agreement extends for several fiscal years, continuation of this Agreement is subject to appropriation of funds for this Project. If funds to enable the City to effect continued payment under this Agreement are not appropriated or otherwise made available, the City shall have the right to terminate this Agreement without penalty at the end of the last period for which funds have been appropriated or otherwise made available by giving written notice of termination to Contractor. The Contract Administrator shall give Contractor

written notice of such non-appropriation within thirty (30) days after it receives notice of such non-appropriation.

D. The provisions of Articles VI and VIII shall survive the expiration or earlier termination of this Agreement for any reason. The expiration or termination of this Agreement, for any reason, shall not release either party from any obligation or liability to the other party, including any payment obligation that has already accrued and Contractor's obligation to deliver all Deliverables due as of the date of termination of the Agreement.

XII. REMEDIES

A. This Agreement does not, and is not intended to, impair, divest, delegate or contravene any constitutional, statutory and/or other legal right, privilege, power, obligation, duty or immunity of the Parties.

B. All rights and remedies provided in this Agreement are cumulative and not exclusive, and the exercise by either party of any right or remedy does not preclude the exercise of any other rights or remedies that may now or subsequently be available at law, in equity, by statute, in any agreement between the parties or otherwise.

C. Absent a written waiver, no act, failure, or delay by a Party to pursue or enforce any rights or remedies under this Agreement shall constitute a waiver of those rights with regard to any existing or subsequent breach of this Agreement. No waiver of any term, condition, or provision of this Agreement, whether by conduct or otherwise, in one or more instances, shall be deemed or construed as a continuing waiver of any term, condition, or provision of this Agreement. No waiver by either Party shall subsequently effect its right to require strict performance of this Agreement.

XIII. NOTICE

All notices and submissions required under this Agreement shall be delivered to the respective party in the manner described herein to the address stated below or such other address as either party may designate by prior written notice to the other. Notices given under this Agreement shall be in writing and shall be personally delivered, sent by next day express delivery service, certified mail, or first class U.S. mail postage prepaid, and addressed to the person listed below. Notice will be deemed given on the date when one of the following first occur: (1) the date of actual receipt; (2) the next business day when notice is sent next day express delivery service or personal delivery; or (3) three days after mailing first class or certified U.S. mail.

If Notice is sent to the CONTRACTOR, it shall be addressed and sent to:

AECOM Great Lakes, Inc.

_____
(insert name of Supervising Professional)

40600 ANN ARBOR RD E STE 201
PLYMOUTH MI 48170

If Notice is sent to the CITY, it shall be addressed and sent to:

City of Ann Arbor
Attn: Brian Steglitz, PE, Interim Public Services Area Administrator
(insert name of Administering Service Area Administrator)
301 E. Huron St.
Ann Arbor, Michigan 48104

With a copy to: The City of Ann Arbor
ATTN: Office of the City Attorney
301 East Huron Street, 3rd Floor
Ann Arbor, Michigan 48104

XIV. CHOICE OF LAW AND FORUM

This Agreement will be governed and controlled in all respects by the laws of the State of Michigan, including interpretation, enforceability, validity and construction, excepting the principles of conflicts of law. The parties submit to the jurisdiction and venue of the Circuit Court for Washtenaw County, State of Michigan, or, if original jurisdiction can be established, the United States District Court for the Eastern District of Michigan, Southern Division, with respect to any action arising, directly or indirectly, out of this Agreement or the performance or breach of this Agreement. The parties stipulate that the venues referenced in this Agreement are convenient and waive any claim of non-convenience.

XV. OWNERSHIP OF DOCUMENTS

Upon completion or termination of this Agreement, all documents (i.e., Deliverables) prepared by or obtained by the Contractor as provided under the terms of this Agreement shall be delivered to and become the property of the City. Original basic survey notes, sketches, charts, drawings, partially completed drawings, computations, quantities and other data shall remain in the possession of the Contractor as instruments of service unless specifically incorporated in a deliverable, but shall be made available, upon request, to the City without restriction or limitation on their use. The City acknowledges that the documents are prepared only for the Project. Prior to completion of the contracted Services the City shall have a recognized proprietary interest in the work product of the Contractor.

XVI. CONFLICTS OF INTEREST OR REPRESENTATION

Contractor certifies it has no financial interest in the Services to be provided under this Agreement other than the compensation specified herein. Contractor further certifies that it presently has no personal or financial interest, and shall not acquire any such interest, direct or indirect, which would conflict in any manner with its performance of the Services under this Agreement.

Contractor agrees to advise the City if Contractor has been or is retained to handle any matter in which its representation is adverse to the City. The City's prospective consent to the Contractor's representation of a client in matters adverse to the City, as identified above, will not apply in any instance where, as the result of Contractor's representation, the Contractor has obtained sensitive, proprietary or otherwise confidential information of a non-public nature that, if known to another client of the Contractor, could be used in any such other matter by the other client to the material disadvantage of the City. Each matter will be reviewed on a case by case basis.

XVII. SEVERABILITY OF PROVISIONS

Whenever possible, each provision of this Agreement will be interpreted in a manner as to be effective and valid under applicable law. However, if any provision of this Agreement or the application of any provision to any party or circumstance will be prohibited by or invalid under applicable law, that provision will be ineffective to the extent of the prohibition or invalidity without invalidating the remainder of the provisions of this Agreement or the application of the provision to other parties and circumstances.

XVIII. EXTENT OF AGREEMENT

This Agreement, together with Exhibits A, B, C, and D, constitutes the entire understanding between the City and the Contractor with respect to the subject matter of the Agreement and it supersedes, unless otherwise incorporated by reference herein, all prior representations, negotiations, agreements or understandings whether written or oral. Neither party has relied on any prior representations, of any kind or nature, in entering into this Agreement. No terms or conditions of either party's invoice, purchase order or other administrative document shall modify the terms and conditions of this Agreement, regardless of the other party's failure to object to such form. This Agreement shall be binding on and shall inure to the benefit of the parties to this Agreement and their permitted successors and permitted assigns and nothing in this Agreement, express or implied, is intended to or shall confer on any other person or entity any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Agreement. This Agreement may only be altered, amended or modified by written amendment signed by the Contractor and the City. This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which together shall be deemed to be one and the same agreement.

XIX. ELECTRONIC TRANSACTION

The parties agree that signatures on this Agreement may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this Agreement. This Agreement may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

XX. EFFECTIVE DATE

This Agreement will become effective when all parties have signed it. The Effective Date of this Agreement will be the date this Agreement is signed by the last party to sign it.

[REMAINDER OF PAGE LEFT BLANK; SIGNATURE PAGE FOLLOWS]

FOR CONTRACTOR

By _____
Type Name

Its

Date: _____

FOR THE CITY OF ANN ARBOR

By _____
Christopher Taylor, Mayor

By _____
Jacqueline Beaudry, City Clerk

Date: _____

Approved as to substance

_____
Brian Steglitz, Interim Public Services Area Administrator

_____
Mr. Milton Dohoney, Jr., Interim City Administrator

Approved as to form and content

_____
Stephen K. Postema, City Attorney

SAMPLE PERFORMANCE BOND

(1) AECOM Great Lakes, Inc. of 40600 ANN ARBOR RD E STE 201 PLYMOUTH MI 48170 (referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for $ _____, the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.

(2) The Principal has entered a written Contract with the City entitled WTP Facility Plan 2022 _____, for RFP No. 20-04 and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq.

(3) Whenever the Principal is declared by the City to be in default under the Contract, the Surety may promptly remedy the default or shall promptly:

(a) complete the Contract in accordance with its terms and conditions; or

(b) obtain a bid or bids for submission to the City for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, arrange for a Contract between such bidder and the City, and make available, as work progresses, sufficient funds to pay the cost of completion less the balance of the Contract price; but not exceeding, including other costs and damages for which Surety may be liable hereunder, the amount set forth in paragraph 1.

(4) Surety shall have no obligation to the City if the Principal fully and promptly performs under the Contract.

(5) Surety agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder, or the specifications accompanying it shall in any way affect its obligations on this bond, and waives notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work, or to the specifications.

(6) Principal, Surety, and the City agree that signatures on this bond may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this bond. This bond may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

SIGNED AND SEALED this _____ day of _____, 202_.

_____	_____
(Name of Surety Company)	(Name of Principal)
By _____	By _____
(Signature)	(Signature)
Its _____	Its _____
(Title of Office)	(Title of Office)
Approved as to form:	Name and address of agent:
_____	_____
Stephen K. Postema, City Attorney	_____
	_____

SAMPLE LABOR AND MATERIAL BOND

(1) _____

of _____(referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan, (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for the use and benefit of claimants as defined in Act 213 of Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq., in the amount of $ _____, for the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.

(2) The Principal has entered a written Contract with the City entitled: WTP Facility Plan 2022 _____

_____

_____

_____, for RFP No. 20-04 ; and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963 as amended;

(3) If the Principal fails to promptly and fully repay claimants for labor and material reasonably required under the Contract, the Surety shall pay those claimants.

(4) Surety's obligations shall not exceed the amount stated in paragraph 1, and Surety shall have no obligation if the Principal promptly and fully pays the claimants.

(5) Principal, Surety, and the City agree that signatures on this bond may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this bond. This bond may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

SIGNED AND SEALED this _____ day of _____, 202_

_____
(Name of Surety Company)
By _____
(Signature)
Its _____
(Title of Office)

Approved as to form:

_____
Stephen K. Postema, City Attorney

_____
(Name of Principal)
By _____
(Signature)
Its _____
(Title of Office)

Name and address of agent:

_____

_____

_____

EXHIBIT A
SCOPE OF SERVICES

(Scope of Work follows)

EXHIBIT A – SCOPE OF SERVICES

RFP# 20-04

WTP WATER SYSTEMS FACILITY PLAN

City of Ann Arbor
Public Services Area / Water Treatment Services Unit

SECTION I - GENERAL INFORMATION

A. OBJECTIVE

The City of Ann Arbor is seeking a Water Systems Facility Plan that shall consider the operational, maintenance and regulatory needs of the City's Water Treatment Plant (WTP), ensuring that near-term decisions do not restrict the ability to address long-term future needs. The Facility Plan shall look at the needs of the WTP as a whole, while providing a near-term focus on the rehabilitation of the 1938 Plant 1.

The proposed rehabilitation of the 1938 Plant 1 is anticipated to fundamentally consist of:

- Replacement of the rectangular primary softening basins 1 and 2 and associated floc basins.
- Replacement of the circular secondary softening basin 3.
- Demolition of the sludge storage tanks.
- Repair or replacement of the sludge thickeners.
- Installation of a permanent UV system and removal of the temporary system.
- Associated process piping modifications.
- Augmentation of the sodium hydroxide feed system.
- Other chemical feed system improvements.
- Addressing water quality issues, regulatory requirements, and emerging contaminants.
- Improved flexibility and redundancy.

The Water Systems Facility Plan will be followed by separate RFPs for a Progressive Design Build (PDB) Phase and an Owners Advisor role. Award of the Water Systems Facility Plan does not preclude the successful Proposer from proposing on the future PDB or Owners Advisor Projects.

SECTION II - SCOPE OF SERVICES

1. Introduction

1.1. Background

1.1.1. WTP Background

1.1.1.1. The City of Ann Arbor (City) provides drinking water to approximately 125,000 people residing in the City and neighboring townships. The City's drinking water is drawn from both surface and groundwater sources. Raw water supply is typically 85% (range 75-100%) surface water and 15% (range 5-25%) groundwater. The original Water Treatment Plant (WTP) was constructed in 1938 with expansions in 1949, 1965 and 1975. In 1996, ozone disinfection was added as primary disinfectant. The WTP is rated for 50 MGD and includes lime softening, ozone, chloramines and biologically active filters. Residual solids from the treatment process are dewatered and land applied or sent to a storage lagoon that is near capacity.

1.1.1.2. The WTP is comprised of two parallel primary and secondary treatment trains, namely Plant 1 and Plant 2. Plant 1 (Basins 1-3) is rated at 22 MGD and Plant 2 (Basins 4-5) is rated at 28 MGD. Both treatment trains are in service during high demand periods. However most of the year, only one treatment train is needed. The WTP normally operates as a two-stage split treatment plant with two-stage recarbonation. For emergencies and maintenance, the WTP can operate as two-stage softening without split treatment, single stage softening with single stage recarbonation, or recarbonation without split.

1.1.1.3. Several chemicals are added to the process to aid in treatment. A cationic polymer is added at the raw water intake for seasonal zebra mussel control and added to the treatment process for settling and filterability. Phosphate is added to stabilize the water subsequent to the softening process to prevent hardness precipitation in the filters. Adjustment of pH at various stages in the treatment process is made through the addition of well water, CO_2 and sodium hydroxide.

1.1.2. 1938 Plant 1 Background

1.1.2.1. Plant 1 consists Rapid Mix Basins 1&2, Flocculation Basins 1&2, rectangular Sedimentation Basins 1&2, Flocculation Basin 3 and a circular Clarifier 3. The Flocculation and Sedimentation basins utilize horizontal paddle wheels driven by chains and sprockets.

1.1.2.2. The 1938 Plant 1 is in need of rehabilitation. It possesses:

1.1.2.2.1. Significant deterioration of the infrastructure including concrete, mechanical equipment, process piping.

1.1.2.2.2. High maintenance costs associated with equipment repair and basin cleaning.

1.1.2.2.3. Significant outage times due to broken equipment.

1.1.2.2.4. Does not meet current design standards for weir loading and being uncovered / open to the environment.

1.2. Project Overview

1.2.1. The City of Ann Arbor is seeking a Water Systems Facility Plan for the City's Water Treatment Plant that shall consider the operational, maintenance and regulatory long-term needs including current and projected water quality challenges.

1.2.2. The Facility Plan shall look at the needs of the WTP as a whole, while providing a near-term focus on the rehabilitation of the 1938 Plant 1. The Facility Plan shall ensure that the near-term improvements take into consideration, will not negatively impact, and will not restrict the ability to address the long-term future needs.

1.2.3. The proposed rehabilitation of the 1938 Plant 1 is anticipated to fundamentally consist of:

- 1.2.3.1. Replacement of the rectangular primary softening basins 1 and 2 and associated floc basins.
- 1.2.3.2. Replacement of the circular secondary softening basin 3.
- 1.2.3.3. Demolition of the sludge storage tanks.
- 1.2.3.4. Repair or replacement of the sludge thickeners.
- 1.2.3.5. Installation of a permanent UV system and repurposing of the temporary system.
- 1.2.3.6. Associated process piping modifications.
- 1.2.3.7. Augmentation of the sodium hydroxide feed system.
- 1.2.3.8. Other chemical feed system improvements.
- 1.2.3.9. Addressing water quality issues, regulatory requirements, and emerging contaminants.
- 1.2.3.10. Improved flexibility and redundancy.

1.2.4. The Water Systems Facility Plan will be followed by separate RFPs for the Progressive Design Build (PDB) Phase and the Owners Advisor role. Award of the Water Systems Facility Plan does not preclude the successful Proposer from proposing on the future PDB or Owners Advisor Projects.

1.3. Recent or On-going Projects. There has been significant activity at the WTP in recent years. Some of the recent or on-going projects include:

1.3.1. 2006 WTP Master Plan

1.3.1.1. The 2006 WTP Master Plan included a condition assessment of all the major plant components. Among other things, the plan recommended replacement of the 1938 basins with more efficient treatment technology. As recommended by the Master Plan, a new lime feed was completed in 2013, but no basins were replaced.

1.3.2. 2015 WTP Alternatives Report

1.3.2.1. This report completed in August 2015 included source and system reliability alternatives; Plant 1 condition assessments; Plant 1 rehabilitation alternatives; and residuals treatment alternatives analysis.

1.3.2.2. The 2015 WTP Alternatives Report principally recommended:

1.3.2.2.1. Replacement of rectangular primary softening basis 1 and 2 with a single-stage solids contact clarifier.

1.3.2.2.2. Replacement of the secondary softening basin 3 with a single-stage solids contact clarifier that could operate in parallel or series with the replacement for basins 1 and 2.

1.3.2.2.3. Dredging of the existing sludge lagoon (currently scheduled for FY24-25) and continuing of filter press operation with land application.

1.3.3. PFAS

1.3.3.1. In 2018 and 2019, the City installed Calgon F400 granular activated carbon (GAC) in the filters to replace the existing Calgon F300. The new F400 GAC is on a replacement cycle of every 24 months. The replacement is in effort to increase removal of PFAS from the drinking water. Since the carbon change-outs, PFOA and PFOS levels in the City's drinking water have been non-detect.

1.3.4. *Cryptosporidium*

1.3.4.1. In June 2017, EGLE (then MDEQ) notified the City that their drinking water supply contained levels of *Cryptosporidium* that require additional protection to comply with the EPA Long-term 2 Enhanced Surface Water Treatment Rule (LT2). EGLE stated that compliance for treatment was required by June 2020.

1.3.4.2. The WTP can meet the LT2 regulations through a combination of combined filter effluent turbidity and two-stage softening. However if either of these barriers encounter a problem or are taken out of service, it was determined that an interim Ultraviolet Disinfection System shall be installed to be the additional barrier and meet the regulations.

1.3.4.3. Construction of the interim system is complete. The interim UV system has a firm capacity of 25 MGD.

1.3.5. 1,4-Dioxane

1.3.5.1. Between July and December 2019, the City has been evaluating locations to install sentinel monitoring wells between the north edge of the prohibition zone and Barton Pond. This work is part of the City's approach to ensure the City's surface water supply is protected from contamination.

1.3.5.2. Other on-going related activities include public engagement, Superfund discussions, and EGLE coordination. It is anticipated that the locations of the sentinel monitoring wells will soon be finalized. Monitoring and sampling would begin after construction of the wells.

1.3.6. SCADA System Replacement

1.3.6.1. The WTP is currently engaged in a Progressive Design Build project for a new SCADA system. This new system includes replacement of the SCADA software, programming and screen development, PLC and hardware replacement, modifications to the Control Room, and improvements to cyber security, communications and other related work. The WTP is assisted on this project with an Owners Advisor role.

1.3.7. Raw Water Intake and Watermain Replacement

1.3.7.1. Design has been substantially completed for the replacement of the raw water intake. Replacement includes the piping from the intake to the Barton Raw Water Pump Station, and the valves at the pump station. Construction is anticipated in approximately 2022 through 2025.

1.3.8. Architectural / Structural Improvements project

1.3.8.1. The Water Treatment Services Unit (WTSU) maintains approximately 20 different building envelopes and roofing systems throughout the City including the Water Treatment Plant (WTP), two hydroelectric dam powerhouses, and five remote pump stations.

1.3.8.2. Several of the buildings associated with the WTP, pump stations and hydroelectric dam powerhouse were found to exist in various conditions ranging from very poor to satisfactory.

1.3.8.3. The WTP is in the middle of a multi-phased project whose scope includes performing prioritized masonry restoration and roofing repairs and replacement. The goal of the repairs is to restore the WTP facilities to structural soundness and prolong useful life while maintaining overall general appearances (color, style, details, materials, etc.).

1.3.9. Ammonia Feed Improvements

1.3.9.1. The WTP recently completed improvements to the ammonia feed system. The WTP uses sodium hypochlorite in combination with ammonia gas to generate monochloramines for secondary disinfection in the distribution system.

1.3.9.2. The project included new ammoniator panels, and replacement of all valves and piping from the bulk and day tanks. Ammonia feed is still adjusted manually based upon residuals. However, the new ammoniators are capable of automatic adjustment.

1.3.10. Asset Management Plan development

1.3.10.1. The WTP is in the process of implementing its Asset Management Plan. The WTP has identified 239 of the 2032 assets in its computerized maintenance management system to be considered “AMP” assets. The WTP has completed the condition assessment of 60 of the 239 assets. Information gaps should be anticipated as the WTP works to complete the assessments.

2. Water Systems Facility Plan

2.1. Goals and Objectives

2.1.1. The Facility Plan shall consider the long-term needs of the City's water treatment plant, ensuring that near-term decisions do not restrict the ability to address long-term future needs. More specifically, it will consider both short and long term needs (operational, maintenance and regulatory) and give consideration to physical layout in a landlocked site.

2.1.2. The Facility Plan shall include a prioritization and sequencing of the needs and recommendations based upon regulatory requirements, criticality, available budget, maintaining of plant operations, etc. The Facility Plan shall provide a road map depicting which components of the plan can be phased, and develop a master schedule.

2.1.3. The Facility Plan shall have a project planning period of approximately 50-years, with equipment replacement cycles at 15-20 years.

2.1.4. The Facility Plan shall provide a clear understanding of the future 1938 Plant 1 rehabilitation project scope to various stakeholders such as City Council, Administrators, WTSU, Customers, and EGLE.

2.1.5. The Facility Plan will be shared with Prospective Bidders in future RFPs for the next phases of the project, namely the Progressive Design Build (PDB) Phase and the Owner's Advisor role.

2.1.6. The Facility Plan is necessary to seek various funding sources, facilitate public engagement, perform financial planning, initiate EGLE approvals, etc.

2.2. Desired level of efforts; Establishing expectations

2.2.1. Although the 2015 WTP Alternatives Report presents conceptual concepts and recommendations, the City desires furtherance of this report which includes a peer review and independent consideration of other alternatives that meet the project Goals and Objectives, and that meet all regulatory requirements.

2.2.2. The Facility Plan should be sufficiently focused to ensure that the Prospective Bidders for the PDB Phase will have a clear understanding of the improvements proposed for design and construction.

2.2.3. Scope items <u>not</u> included in this Facility Plan include:

2.2.3.1. Detailed condition assessments. See 2006 and 2015 assessments in other reports. However, a targeted assessment should be performed as necessary to form the basis of the recommendations (example: primary electrical system).

2.2.3.2. Filter Pressing – the City will continue to use the existing plate and frame filter presses.

2.2.3.3. Remote pump stations

2.2.3.4. Water Storage (elevated and ground)

2.2.3.5. Distribution system improvements – however evaluation of some strategic yard piping at the WTP may be included due to suitability for reliable service and location.

2.2.3.6. Raw Water Improvements – to the well field or the surface water conveyance.

2.2.3.7. Lime Slaking – it is not anticipated that the slaking process will be changed, unless it is determined that a significant change to the treatment process is recommended.

3. Scope of Work

3.1. Task 3.1: Strategic Planning.

3.1.1. Develop the strategic plan for the Water Systems Facility Plan. This task evaluates background information on the facility and water demand projections to support the strategic planning exercise. This task will set the guiding principles and baseline assumptions moving into Task 3.2 (Development / Evaluation of Alternatives), Task 3.4 (Project Management and Administration of Implementation) and define the process that will be followed for community engagement and stakeholder review (Task 3.3). Task 3.1 includes six sub tasks:

- 3.1.1.1. **Task 3.1.1** Project Kickoff Meeting
- 3.1.1.2. **Task 3.1.2** Executive Leadership Role Advisory
- 3.1.1.3. **Task 3.1.3** Leadership Direction Setting Meeting
- 3.1.1.4. **Task 3.1.4** Needs Assessment, including:
  - 3.1.1.4.1. Review background documents.
  - 3.1.1.4.2. Determine future water demands.
- 3.1.1.5. **Task 3.1.5** Strategic planning process using four workshops, including:
  - 3.1.1.5.1. Water Treatment Services Unit transformative goals update.
  - 3.1.1.5.2. Water Systems Facility Plan decision-making framework (including evaluation criteria and weighting).
  - 3.1.1.5.3. Future plans and SWOT analysis.
  - 3.1.1.5.4. Strategic Planning Roadmap
- 3.1.1.6. **Task 3.1.6** Community Engagement Action Plan

3.1.2. **Task 3.1.1** Project Kickoff Meeting.

- 3.1.2.1. Host one meeting with the City to introduce project team, review schedule and budget assumptions, schedule workshops and meetings, confirm communication and invoicing protocols.
- 3.1.2.2. Host one meeting with the City and task leads to review project goals and establish metrics (KPIs) to evaluate project progress and performance. Schedule before the project chartering meeting.
- 3.1.2.3. Charter the project team to review project protocols for communications, templates, responsibilities matrix, file access and storage, etc.
- 3.1.2.4. Conduct monthly project manager meetings with the City to review progress, budget status, schedule status, decisions log, submittal tracking list, action log, and risk register. Use the monthly meeting no less than quarterly to review the project metrics and KPIs.
- 3.1.2.5. Establish and maintain a SharePoint site for document management. Use SharePoint for collaboration with project team members including City staff.

3.1.3. **Task 3.1.2** Executive Leadership Role Advisory.

- 3.1.3.1. Advise and coordinate with both the City's project team (to bring together the resources to deliver the project) and the Executive Leadership Team (those in the decision-making process) to establish and communicate team purpose, role, and responsibility for success and completion. This subtask goal is to define City agencies 'at the table' to ensure successful

project delivery and aligned decision-making and buy-in with city agencies. The process for this subtask is as follows:

3.1.3.2. Establish the Executive Leadership Team, their role, and regular check-in meetings and communications. Confirm membership with City's Project Manager/Water Treatment Services Unit.

3.1.3.3. Define the decision-making protocol for the Water Systems Facility Plan. This protocol will be used to document decisions to move the work forward.

3.1.3.4. Engage the City's project team and the Executive Leadership Team to define the Communications Strategy throughout the course of this project. The Communications Strategy will define: who will be receiving communication, which channels these communications will come through, and what cadence the communications will follow.

3.1.4. **Task 3.1.3** Leadership Direction Setting Meeting.

3.1.4.1. The Direction Setting Meeting will consist of both educational portions to share current status of the project with relevant City leaders and agencies with a stake in the decision-making, and also active engagement to reach consensus on priorities for this project and then define guiding principles that will be the foundation for the Water Systems Facility Plan Roadmap. The preparations for the Direction Setting Meeting will begin prior to the session (depending on calendar availability) with 1:1 Leadership Interviews. The existing mission and vision established by the Public Services Area and adopted by the Water Treatment Services Unit will be maintained. The process for this subtask is as follows:

3.1.4.2. Define date and participants for Direction Setting Meeting.

3.1.4.3. Prepare agenda, pre-read material, and content for Direction Setting Meeting.

3.1.4.4. Review all content with the City's project team.

3.1.4.5. Conduct 1:1 Leadership Interviews.

3.1.4.6. Document Leadership Interviews.

3.1.4.7. Distribute pre-read material to participants.

3.1.4.8. Finalize content and hold session.

3.1.4.9. Document Direction Setting Meeting Report and distribute to participants in **Technical Memorandum 3.1.3**.

3.1.5. **Task 3.1.4A** Review Background Documentation, perform site inspections, etc.

3.1.5.1. Available documentation includes:

3.1.5.1.1. 2006 WTP Master Plan – CH2MHill

3.1.5.1.2. 2015 WTP Alternatives Report – Black & Veatch

3.1.5.1.3. 2017 LT2ESWTR Alternatives

3.1.5.1.4. 2018 Ultraviolet Disinfection System Design Basis Report

3.1.5.1.5. DWRF Project Plan for the 2018 Ultraviolet Disinfection System

3.1.5.1.6. 2019 SCADA System Improvements Basis of Design Report

3.1.5.1.7. 2008 Lime System Improvements Preliminary Design Report

3.1.5.1.8. 2014 Sanitary Survey

3.1.5.1.9. Ozone O&M Manuals

3.1.5.1.10. Monthly Operator Reports
3.1.5.1.11. City's Hydraulic Distribution System Model (Innovyze InfoWater 12.4)
3.1.5.1.12. AutoCAD background drawings of the WTP from past projects for use.

3.1.5.2. Submit detailed data request to the City upon project commencement, such as:
3.1.5.2.1. Detailed operating and performance data under various water quality and seasonal conditions
3.1.5.2.2. Available source water data for PFAS
3.1.5.2.3. Full scale PFAS testing results for the new F400 GAC filters
3.1.5.2.4. Pilot and bench testing results/reports on PFAS removal with both GAC and IX pilot columns
3.1.5.2.5. Updated data for 1,4-dioxane monitoring and assessment of plume migration
3.1.5.2.6. Available source water data for algae occurrence and algal metabolites.

3.1.5.3. Review information prepared and data generated following the 2015 Alternatives Report.

3.1.5.4. Prepare **Technical Memorandum 3.1.4A** and document changes since the preparation of the 2015 WTP Alternatives Evaluation Report that builds on the Council Work Session report and baselines water quality conditions, including the following:
3.1.5.4.1. Summarize past decisions and assumptions.
3.1.5.4.2. Analysis of performance of the existing plant unit processes under various seasonal conditions
3.1.5.4.3. Anticipate changes to regulations and technology advances over the 50-year life of the facility plan.
3.1.5.4.4. Establish baseline conditions for treatment needs:
3.1.5.4.4.1. PFAS (by compound)
3.1.5.4.4.2. 1,4-Dioxane
3.1.5.4.4.3. Algae, cyanobacteria and metabolites (including taste and odor compounds and microcystins)
3.1.5.4.4.4. Turbidity
3.1.5.4.4.5. *Cryptosporidium* and other pathogens
3.1.5.4.4.6. Organics and disinfection by-products
3.1.5.4.4.7. Inorganics (lead, manganese, iron, etc.)
3.1.5.4.4.8. Additional drinking water parameters
3.1.5.4.5. Identify other criteria that will influence process selection, sizing and/or implementation of infrastructure:
3.1.5.4.5.1. Building code requirements
3.1.5.4.5.2. Accessibility
3.1.5.4.5.3. Health and Safety

3.1.6. **Task 3.1.4B** Determine future water demands.

3.1.6.1. Establish design basis for upgrades in both the short-term and long-term, to inform the ultimate build out of the existing site.

3.1.6.2. Describe assumptions for redundancy to determine space needs of different upgrades.

3.1.6.3. Forecast future demands using the State Demographer Office official projections and the contractual flows for the City's wholesale customers. The State Demographer's projections are distributed to local organizations via SEMCOG, WATS and other local agencies.

3.1.6.4. Adjust projections as needed to meet the project planning period.

3.1.6.5. Consider other economic forecast models which may impact the demand forecast.

3.1.6.6. Coordinate with the City's Planning Department on growth projections, specifically the downtown core where densification and vertical development are possible.

3.1.6.7. Consider future growth when sizing and locating project components, if applicable.

3.1.6.8. Prepare **Technical Memorandum 3.1.4B** documenting the future water demand evaluation.

3.1.7. **Task 3.1.5** Conduct and facilitate a strategic planning initiative.

3.1.7.1. Perform Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis and develop Water Treatment Level of Service (LoS) Goals to memorialize critical decisions that will shape the future course of the WTP. Examples of issues to consider include, but are not limited to, performance measures (water hardness goals and the degree of softening desired), emerging contaminants (timing and treatment selection for 1,4-dioxane, timing and treatment for PFAS, plus any other demands on the treatment site), and use of WTP site, future customer service area, research capabilities, etc.

3.1.7.2. Conduct workshops with the City to establish the strategic plan for the project. Prepare and submit a workshop package in advance of each workshop to provide the objective, background or context, and expectations for participation. Each workshop will be summarized in a Technical Memorandum documenting the major discussions and outcomes.

3.1.7.2.1. Confirm participants in all four strategic planning workshops, consistent with the decision-making framework.

3.1.7.2.2. Confirm timing of workshops based on preliminary sequence presented below.

3.1.7.2.3. Note that attendance at the workshop is in addition to attendance at Leadership Direction Setting Meeting, depending on participants.

3.1.7.3. **Workshop 3.1A** Update Water Treatment Services Transformative Goals.

3.1.7.3.1. Baseline of the workshop will be to start with the Water Treatment Service Unit's existing Vision and Mission and Transformative Goals.

3.1.7.3.2. Review, validate, and update the goals based on current and future needs for the water system and the community it serves. The Water Treatment Services Unit's existing Vision and Mission and Transformative Goals will serve as a baseline to the updated Transformative Goals; these in turn inform the metrics as categories under which the metrics fall. The metrics will be reviewed and updated by the City as needed and are not being updated as part of Task 3.1 or any other part of the Project.

3.1.7.3.3. Summarize as part of **Technical Memorandum 3.1.5A.**

3.1.7.4. **Workshop 3.1B** – Framework for Decision Making, Establish Criteria and Weighting for Evaluation.

3.1.7.4.1. Establish the decision framework and baseline conditions for the long-term facility plan (identify the stakeholders, describe rules of engagement, and confirm use of Criterium Decision Plus as the software tool to present the analysis).

3.1.7.4.2. Confirm process to be followed for public engagement.

3.1.7.4.3. Identify preliminary evaluation criteria and weighting factors to be used in decision making.

3.1.7.4.4. Confirm and update criteria and weighting factors as part of community engagement process.

3.1.7.4.5. Summarize as part of **Technical Memorandum 3.1.5B.**

3.1.7.5. **Workshop 3.1C** – Future Plant Plans and SWOT Analysis

3.1.7.5.1. Conduct SWOT analysis and process risk review.

3.1.7.5.2. Confirm level of service (LoS) criteria.

3.1.7.5.3. Describe desired future state for the plant, site, and utility.

3.1.7.5.4. Define the "problem" in terms of i) Plant 1 rehabilitation and ii) 50 year facility plan.

3.1.7.5.5. Identify and evaluate potential threats to the raw water supplies (wells and river water) using the City's SWIPP and historical data.

3.1.7.5.6. Rank process risks in terms of threats to public health (quality, quantity and potential contaminants) and aesthetics.

3.1.7.5.7. Identify infrastructure issues that can affect process performance, including electrical systems and mechanical systems.

3.1.7.5.8. Establish the design basis or assumptions for reliability and redundancy.

3.1.7.5.9. Summarize as part of **Technical Memorandum 3.1.5C.**

3.1.7.6. **Workshop 3.1D** Strategic Planning Roadmap.

3.1.7.6.1. This workshop will be the culmination of all other Workshops (A, B, and C) and the Community Engagement Action Plan from **Task 3.1.6.**

3.1.7.6.2. Present and review draft Roadmap, which is for the water system for the next 50 years.

3.1.7.6.3. Validate and finalize Roadmap as part of **Technical Memorandum 3.1.5**, including assumptions and decisions made during Task 3.1, describing boundary conditions, framework for decision making, and rules for stakeholder engagement. These are effectively the baseline conditions for the subsequent development of alternatives, and evaluation. Once the baseline is established, key decisions that drive the future needs and use of the water treatment plant site can be addressed.

3.1.7.6.4. Use the 50 year planning horizon in broad terms to integrate the timelines necessary to carry out the planning, design and construction of infrastructure to accommodate major treatment needs such as 1,4-dioxane, *Cryptosporidium*, and PFAS.

3.1.8. The strategic planning may include various stakeholders such as Council members, Administrators, WTP staff and others. Review participants and schedule of participation with City.

3.1.9. The conclusions of the strategic planning initiative shall be used as a guiding tool throughout the preparation of the Water Systems Facility Plan.

3.1.10. **Task 3.1.6** Develop Community Engagement Action Plan (CEAP).

3.1.10.1. Develop Community Engagement Action Plan. Implementation of the CEAP is described in Task 3.3. This step will answer the questions who, why and when for the Community Engagement Action Plan, including:

3.1.10.1.1. Prepare the list of participants for each of the key stakeholder groups.

3.1.10.1.2. Define the purpose, desired outcomes and impacts of the CEAP.

3.1.10.1.3. Set the meeting schedules.

3.1.10.1.4. Obtain buy-in on the CEAP from project team and the Executive Leadership Team.

3.1.10.1.5. Develop preliminary schedule for community engagement.

3.1.10.1.6. Define purpose and impact of CEAP - Who? Why? When?

3.1.10.1.7. Obtain buy-in on preliminary schedule.

3.1.10.2. Refine Key Stakeholders List and define roles.

3.1.10.2.1. Determine Community Engagement vital allies by analyzing the results of the kick-off meetings and document review. Specify roles for the vital allies and identify risks among stakeholders. Maintain and keep the stakeholder list up-to-date, given that the project takes place over 12 months and individuals in roles with stakeholders will shift.

3.1.10.2.2. Determine Citizen Advisory Committee members and role.

3.1.10.2.2.1. The Citizen Advisory Committee will consist of individuals and stakeholder group representatives who represent a broad spectrum of interests and knowledge around the Water Systems Facility Plan. This may include representation from residential neighborhood groups; non-profit groups; environmental organizations; boards and

commissions; large customers; Ann Arbor and Scio Townships; and City units. The selection of committee members shall strive for a balance of viewpoints while ensuring that all committee members are capable and committed to engaging in the entire process. Work with the Equitable Engagement Advisory Committee to ensure representation on the Citizen Advisory Committee of diverse, historically underrepresented stakeholders.

3.1.10.2.2.2. The role of the Citizen Advisory Committee is to provide feedback on the scope, content, direction and recommendations of the plan, and provide guidance on the best approaches for engaging stakeholder groups and the broader public over the course of the project. The Citizen Advisory Committee will not be the principal decision maker during the planning process.

3.1.10.2.3. Identify other stakeholders to the process.

3.1.10.2.3.1. The general public, consisting of any and all City residents, stakeholders and others interested in the study area, may participate in the process through a series of City-wide engagement activities during the course of the project. Public comment or other feedback activities shall be included in engagement activities. The public shall also be invited to add their names to the City's e-mail notification system so they can be notified when new materials are posted on the project web site. Mailing lists can also be developed based on engagement activity sign-in sheets. Other stakeholders include, but are not limited to, the following:

3.1.10.2.3.2. Customers (Scio Township, Ann Arbor Township, University of Michigan, local groups, businesses, citizens, etc.). Work with City staff to determine top customers (defined by water consumption) and provide opportunity for major customers to participate.

3.1.10.2.3.3. WTP operators.

3.1.10.2.3.4. WTP maintenance technicians.

3.1.10.2.3.5. Council members.

3.1.10.2.3.6. City administrators.

3.1.10.2.3.7. City finance department.

3.1.10.2.3.8. Wastewater Treatment Service Unit.

3.1.10.2.3.9. State of Michigan Environment, Great Lakes and Energy.

3.1.10.3. Identify and manage risks among stakeholders.

3.1.10.4. Maintain and update key stakeholder list (ongoing).

3.1.10.4.1. Develop a comprehensive list of all key stakeholders including name, organization, contact information, assessment of risk, identification of key allies, and role assignments for the project.

3.1.11. Task 3.1 Strategic Planning Allowances.

3.1.11.1. Task 3.1.7 Strategic Planning Allowance.

3.1.11.1.1. Prepare and participate in meeting with City Council to present the Strategic Planning Roadmap consistent with the CEAP.

3.1.11.1.2. Prepare a summary document (approximately 10 pages in length) with proposed resolution for adoption.

3.1.11.1.3. Schedule presentation to Council after Workshop 3.1D as coordinated with the CEAP.

3.1.11.2. Prepare and participate in additional workshop with City staff to support the development and refinement of the Strategic Planning Roadmap.

END OF TASK 3.1

3.2. Task 3.2 Development/Evaluation of Alternatives.

3.2.1. The objective of this task is to peer review and validate or identify areas for improvement in the work completed to date and to advance the evaluation of alternatives to rehabilitate Plant 1 and the preferred approach that will reliably meet the City's water demands and treated water quality objectives over the 50 year planning horizon. Only one alternative will be advanced to Task 3.4 for project planning and implementation.

3.2.2. For each of the sub tasks included in Task 3.2, a technical memorandum will be prepared to describe the scope of the investigations, preliminary basis of design, sketches, economic comparisons, economic and non-economic evaluations, opinions of cost, conclusions, recommendations, etc. These technical memoranda will serve as the basis for a holistic review of plausible integrated treatment trains under consideration to meet the overall project objectives.

3.2.3. Task 3.2 includes the following sub tasks:

- 3.2.3.1. **Task 3.2.1** Furtherance of the 2015 WTP Alternatives Report
- 3.2.3.2. **Task 3.2.2** Review of Softening Technologies
- 3.2.3.3. **Task 3.2.3** Conversion to Single Stage Softening
- 3.2.3.4. **Task 3.2.4** Disinfection and Oxidation Strategy (including ozone and UV)
- 3.2.3.5. **Task 3.2.5** Potential Treatment of 1,4-Dioxane
- 3.2.3.6. **Task 3.2.6** Long Term PFAS Treatment Options
- 3.2.3.7. **Task 3.2.7** Other Emerging Contaminants
- 3.2.3.8. **Task 3.2.8** Sodium Hydroxide Feed System
- 3.2.3.9. **Task 3.2.9** Evaluation of WWTP Biosolids Disposal Needs
- 3.2.3.10. **Task 3.2.10** Electrical Improvements
- 3.2.3.11. **Task 3.2.11** Miscellaneous Considerations (Auxiliary Systems and Facilities)
- 3.2.3.12. **Task 3.2.12** Decision Making to Evaluate Alternatives for WTP Improvements
- 3.2.3.13. **Task 3.2.13** Part 12 Reliability Study

3.2.4. **Task 3.2.1** Furtherance of the 2015 WTP Alternatives Report.

- 3.2.4.1. Perform peer review of the 2015 WTP Alternatives Report by Black & Veatch. This will include a review of sections of the 2015 Alternatives Report based on the outcomes of the strategic planning exercise of Task 3.1 and recommendations from the September 13, 2021 Council work session. For example, sections regarding new supplies or GLWA will not be peer reviewed.
- 3.2.4.2. Perform process-focused risk assessment based on operational staff interviews and review of existing Risk and Resiliency Assessment to determine points of weakness, legacy workarounds and lack of redundancy at:
  - 3.2.4.2.1. The raw water sources in terms of quality, quantity and potential contaminants
  - 3.2.4.2.2. The water treatment plant, including electrical systems and treatment processes.

3.2.4.3. Assess the viability and consequence of the “do nothing” option from the 2015 WTP Alternatives Report.

3.2.4.4. Summarize the findings of the Peer Review as **Technical Memorandum 3.2.1**.

3.2.5. **Task 3.2.2** Review of Softening Technologies.

3.2.5.1. Review plausible approaches to upgrading of the existing approach to lime softening in Plant 1, taking into account:

3.2.5.1.1. 2015 WTP Alternatives Report.

3.2.5.1.2. Jar testing work previously completed to assess alternative approaches to lime softening, which included evaluation of single stage softening using lime-soda ash, as well as lime-caustic.

3.2.5.1.3. Jar testing work previously completed to assess various approaches to improving clarified water turbidity.

3.2.5.2. Evaluate both alternative chemical dosing regimens for optimal softening as well alternative softening technologies. Optimal softening objectives have been set by the City.

3.2.5.3. Review technology advances, performance expectations, and assumptions for implementation for alternative softening technologies for the City’s groundwater and surface water. Analysis will also include consideration of how softening technology selection plays into other treatment objectives for the plant, including disinfection objectives, and the removal of PFAS or 1,4-dioxane. The following technologies shall be considered:

3.2.5.3.1. Two-stage softening using solids contact clarifiers.

3.2.5.3.2. Single stage softening using solids contact clarifiers.

3.2.5.3.3. High rate softening (two- or single-stage).

3.2.5.3.4. Membrane softening using NF or RO membranes.

3.2.5.4. Review projected impacts to residuals management through use of the various softening approaches.

3.2.5.5. Use triple bottom-line decision making methodologies to assess the various approaches, including the development of capital and operating estimates, but also accounting for other non-cost related factors driving the decision. Where appropriate, draw upon case studies to support the decision-making process.

3.2.5.6. Evaluate the impact that waste streams may have on the Wastewater Treatment Plant (WWTP), both positive and negative.

3.2.5.7. Review merits and approaches for demonstration testing of softening, including an overview of the objectives for testing, duration, operations, costs, temporary/rental versus permanent pilot installation. Develop the framework for the experimental plan including how jar testing will be used to support piloting. Generate proposed sampling schedule and operational schedule. Review framework with City prior to review with EGLE.

3.2.5.7.1. Conduct one meeting with EGLE to discuss demonstration testing and expectations.

3.2.5.7.2. Note that the design and procurement of demonstration testing equipment is addressed in Task 3.4.

3.2.5.8. Undertake a review of impacts of the formation of calcium carbonate hexahydrate (CCH) on the treatment process, including residuals management. The formation of CCH is typically a transient occurrence in lime softening plants, typically triggered by a combination of lower raw water temperatures and other factors. It is our understanding that CCH formation is a comparatively rare occurrence at the WTP, and it is difficult to undertake physical testing unless CCH formation actually occurs. Under this task:

3.2.5.8.1. Analyze known previous CCH formation events at the WTP, in the attempt to characterize the factors which may have triggered CCH formation, and to assess overall impacts of the events, including impacts on operator level of effort, chemical costs, finished water hardness and pH, and sludge disposal costs. Include statistical analysis of plant operating data (if available), and interviews with plant operators.

3.2.5.8.2. Conduct a telephone survey of CCH formation at other lime softening plants around North America, to develop a knowledge base around factors which trigger CCH formation, the magnitude of impacts of CCH formation on ongoing operations, including residuals management, and mitigation strategies.

3.2.5.9. Document and summarize the findings of the softening technologies review in **Technical Memorandum 3.2.2** for use in Task 3.4.

3.2.6. **Task 3.2.3** Conversion to Single Stage Softening.

3.2.6.1. Determine design criteria for sustainable operation in single-stage softening mode, including the approach to softening (lime, lime-soda ash, lime-caustic, etc.), the number, area, and type of clarifiers required, process hydraulics, redundancy strategy (including redundant feeds to the filters), and recarbonation needs. Consider the balance of demands, flexibility, redundancy, available space, budget, etc. Incorporate current regulatory requirements, such as covered basins. Assess the hydraulic logistics of operating with Plant 2 and review the hydraulic grade lines, Barton Pump curves, etc.

3.2.6.2. Liaison with EGLE to confirm regulatory requirements for an upgraded plant operating in single-stage softening mode. This would include consideration of impacts to disinfection strategy, and the potential need for the basins to be covered.

3.2.6.3. Determine the impacts to residuals management of a switch to single-stage softening.

3.2.6.4. Consider future changes to raw water supply. Example: changes to source water blending, more well water as a percentage of total flow.

3.2.6.5. Develop concepts to ensure that conversion to single stage softening can be successfully accomplished.

3.2.6.5.1. Develop a contingency plan if the recommendations include one clarifier, if single stage softening is not successful after construction? Or at certain times of the year?

3.2.6.5.2. Evaluate feasibility of providing flexibility to hydraulically connect two clarifiers to operate in parallel (as single-stage softening units), or in series (as two-stage softening units).

3.2.6.6. Assess and incorporate Plant 2 Clarifiers 4/5 to the extent that they should be considered as part of the overall operations, redundancy strategies, and long-term financial planning and will require replacement at some point. If replacement is within the horizon of the Facility Plan, Plant 2 shall be conceptually included for financial forecasting in future phases.

3.2.6.6.1. Plan a full scale test for Plant 2 to confirm operating conditions and performance when Plant 1 is out of service for rehabilitation. The Plant 2 full scale testing plan will include a demonstration testing schedule and water sampling plan.

3.2.6.6.2. Determine if ancillary processes will require modification in the near term to support the full scale Plant 2 testing. Scope modifications necessary to accommodate Plant 2 testing.

3.2.6.7. Assess the degree to which single stage operation (and residuals handling operations) might be impacted if CCH formation does occur.

3.2.6.8. Summarize analysis of conversion to single stage softening, including plans for full-scale testing with Plant 2 in **Technical Memorandum 3.2.3**.

3.2.7. **Task 3.2.4** Disinfection and Oxidation Strategy.

3.2.7.1. The WTP currently uses three different methods of disinfection (namely ozone, UV and monochloramines) for different purposes. Perform an overview of the current disinfection methods and develop an overall strategy. Assume that use of monochloramine disinfection will not change. Include approaches for upgrading the existing ozonation system to enhance disinfection, and/or the installation of permanent UV disinfection facilities. The analysis will account for other plausible changes to the overall treatment train, including a switch to single-stage softening, which would lessen the overall pathogen removal credit for the existing treatment train. Treatment flexibility for emerging contaminants will not be covered in this task; however, feasible strategies will be reviewed in later tasks (**Task 3.2.7 Other Emerging Contaminants**).

3.2.7.2. Permanent LT2ESWTR (*Cryptosporidium*) treatment

3.2.7.2.1. The State of Michigan EGLE is requiring a permanent disinfection system to meet the LT2ESWTR requirements for Bin 2. This system will replace the interim UV system that was placed on-line in 2020.

3.2.7.2.2. Develop the recommended method of treatment and address the following as part of the development of alternatives to improve the WTP:

3.2.7.2.2.1. Evaluate that the proposed disinfection strategy is capable of reliably meeting disinfection objectives across the full range of plant operating conditions.

3.2.7.2.2.2. Review whether upgrading the existing ozonation system to increase overall disinfection credit through ozonation is feasible.

3.2.7.2.2.3. Review monochloramine degradation with UV. Evaluate the need to relocate the secondary disinfection feed points to downstream of UV disinfection.

3.2.7.2.2.4. Review sample locations.

3.2.7.2.2.5. Develop the conceptual location on the site including identifying feasible pipe routes and connections.

3.2.7.2.2.6. Review Transfer Pump curves and capacities with new head loss calculations to determine if replacement of transfer pumps will be required.

3.2.7.2.2.7. Present capital (Class 4 cost estimates) and annual operating and maintenance cost estimates.

3.2.7.2.3. Summarize the evaluation and strategy in **Technical Memorandum 3.2.4.**

3.2.7.3. Support refurbishment of two existing ozone generators.

3.2.7.3.1. Review scope of services from Suez/Ozonia and Controls System House.

3.2.7.3.2. Review shop drawings related to replacement of power supply units (PSUs) for two ozone generators.

3.2.7.3.3. Answer requests for information (RFIs) from supplier (Suez/Ozonia) and installation contractor (to be determined).

3.2.7.3.4. Witness operational, controls, and power efficiency testing of refurbished ozone generators.

3.2.8. **Task 3.2.5** Potential Treatment of 1,4-Dioxane.

3.2.8.1. The WTP desires to be proactively positioned to treat the 1,4-dioxane if the sentinel wells forecast the contamination to reach the Huron River raw water source. The eventual migration of the plume to impact the Huron River would require treatment of the full flow at the WTP for 1,4-dioxane. This task will study approaches to 1,4-dioxane treatment for the entire plant flow (combined surface and groundwater).

3.2.8.2. Integrate findings from the ongoing monitoring and treatment evaluation of 1,4-dioxane (underway by others) as part of evaluation of plausible strategies to address concerns of 1,4-dioxane should they arise:

3.2.8.2.1. Highlight the expected timing for impacts to the City's water sources (concentration, frequency and duration).

3.2.8.2.2. Provide a phased approach for additional studies, monitoring, and evaluation of 1,4-Dioxane to serve as a roadmap for future work including identifying indicators to initiate planning for treatment.

3.2.8.3. Determine recommended percent removals (target removal) and describe the basis for the determination.

3.2.8.4. Determine the preferred method of treatment:

3.2.8.4.1. Consider both ozone-peroxide and UV-peroxide advanced oxidation processes, based on modifications to existing equipment/facilities or new equipment/facilities.

3.2.8.4.2. Identify building considerations, process and equipment capacity, and other necessary improvements

3.2.8.4.3. Evaluate bromate formation and review permit limits.

3.2.8.4.4. Consider other disinfection by-products .

3.2.8.4.5. Consider AOP impact on the biofilters. Consider GAC and other quenching needs (i.e., to quench the peroxide). Consider what are the potential water quality impacts.

3.2.8.5. Develop life cycle cost comparison, capital cost (Class 4 cost estimate), annual operating and maintenance costs, energy costs, etc. as part of evaluation of WTP improvement alternatives.

3.2.8.6. Develop conceptual location on the site.

3.2.8.7. Perform conceptual review of constructability. Can the WTP maintain treatment while the improvements are being constructed?

3.2.8.8. Summarize analysis and evaluation in **Technical Memorandum 3.2.5**.

3.2.9. **Task 3.2.6** Long Term PFAS Treatment Options.

3.2.9.1. Compile and review available PFAS source data to identify trends over time such as seasonal variation or dependencies with total organic carbon TOC.

3.2.9.2. Identify data gaps and make recommendations for enhancements to the City's existing monitoring program as appropriate. For example, to address Total Oxidizable Precursor (TOP) Assay for the source water or other PFAS pre-cursor compounds. These precursors could potentially form regulated PFAS compounds following an oxidation process (such as ozonation) and risk future PFAS compliance depending on the WTP improvement alternatives considered.

3.2.9.3. Research available PFAS data in sediment samples within Barton Pond and fish from the Huron River using data collected by others to identify additional potential sources to the water supply.

3.2.9.4. Review and assess the performance of the current PFAS treatment approach by reviewing studies of full-scale GAC. Review performance from pilot columns, and IX columns underway by the City and University of Michigan.

3.2.9.5. Evaluate the operational parameters of the full scale system to project future operational costs with i) the current arrangement and ii) determine if filter bay modifications can enhance performance in terms of hydraulic loading rates, pretreatment, backwashing, and GAC replacement strategies.

3.2.9.6. Develop long-term PFAS treatment strategies to accommodate potential future PFAS regulations (e.g., targeting short chain compounds) as part of the development of alternatives for WTP improvements. Evaluate different technologies such as ion exchange, nanofiltration or reverse osmosis membrane filtration (as a standalone treatment for PFAS, or as part of a membrane softening strategy if carried forward from Task 3.2.2) or modifications to the existing GAC system for possible improvements, including impacts from contaminated waste streams (if applicable).

Incorporate the City's results on performance, comparing single-use virgin GAC versus reactivation of GAC.

3.2.9.7. Develop concept to physically locate the equipment (if applicable).

3.2.9.8. Prepare capital (Class 4 cost estimates) and annual operating cost estimates.

3.2.9.9. Consider other filter modifications to optimize filter performance for PFAS removal and normal operations.

3.2.9.9.1. Prepare recommendations for filter optimization, balancing the competing needs of PFAS removal with bio filtration.

3.2.9.9.2. Investigate feasibility of increasing filter bed depth, raising troughs, etc.

3.2.9.9.3. Develop plan to use dechlorinated filter effluent to backwash filters.

3.2.9.10. Summarize the evaluation in **Technical Memorandum 3.2.6**.

3.2.10. **Task 3.2.7** Other Emerging Contaminants.

3.2.10.1. Identify other emerging contaminants (example: NDMA) and incorporate means to address the needs in the future.

3.2.10.2. Review public health risk and likely treatment needs.

3.2.10.3. Cross reference likely treatment needs against treatment upgrades considered in Tasks 3.2.2 to 3.2.7 as part of the development of alternatives for WTP improvements.

3.2.10.4. Summarize the evaluation in **Technical Memorandum 3.2.7**.

3.2.11. **Task 3.2.8** Sodium Hydroxide (NaOH) Feed System.

3.2.11.1. This task will analyze required upgrades to the existing caustic (sodium hydroxide) dosing system to support either full-scale operation in lime-caustic softening mode, or the more short-term need of undertaking full-scale testing of lime-caustic softening in Plant 2, as described under Task 3.4.1A.

3.2.11.2. Update the review of the NaOH feed system included in the 2015 Alternatives Report.

3.2.11.2.1. Evaluate existing NaOH system and capacity for current and extended use including full scale testing, as applicable.

3.2.11.3. Evaluate additional NaOH needed to reduce hardness if the WTP switches to single stage softening.

3.2.11.4. Evaluate additional NaOH needed to reduce hardness if the WTP lowers hardness goals in the future.

3.2.11.5. Determine impact on sodium levels in the finished water to achieve lower hardness goals.

3.2.11.6. Perform cost evaluation including capital (Class 4 Cost Estimates), O&M, chemical costs.

3.2.11.7. Develop conceptual location on the site as part of the development of alternatives for WTP improvements.

3.2.11.8. Develop design and capital costs (Class 4 Cost Estimates) for full scale pilot testing NaOH requirements.

3.2.11.9. Summarize the evaluation in **Technical Memorandum 3.2.8**.

3.2.12. **Task 3.2.9** Evaluation of WWTP Biosolids Disposal Needs.

3.2.12.1. It is anticipated that future improvements to the WTP stemming from the recommendations in this Project will have the potential to impact operations at the WWTP, most notably to the biosolids management.

3.2.12.2. Evaluate the qualitative impacts that the WTP improvements will have on WTP residuals discharged to the WWTP and quantify the impacts if data are available to make this assessment (i.e., mass loading and percentage contribution).

3.2.12.3. Prepare cost estimates and evaluate the net changes to disposal costs based on current rate structure for biosolids disposal.

3.2.12.4. Summarize the evaluation in **Technical Memorandum 3.2.9**.

3.2.13. **Task 3.2.10** Electrical Improvements

3.2.13.1. The WTP is fed by redundant power feeds from DTE, namely Hobart and Argo medium voltage services. The primary switchgear lineup is located outdoors near the southern property line. Power is distributed throughout the plant as Red, Green, Blue East and Blue West substations. A 1.5MW diesel generator was installed in 1996 to provide backup power.

3.2.13.2. Define Level of Service and desired future state specifically for the electrical system.

3.2.13.3. Develop Preliminary Basis of Design for WTP Primary Electrical System Improvements.

3.2.13.3.1. Review maintenance needs and limitations in discussions with plant operations and maintenance staff. For example, much of the electrical equipment is outdated, parts are becoming unavailable, mechanical systems like kirk keys are failing, and service can be performed by only a select few.

3.2.13.3.2. Determine and assess potential points of failure, lack of redundancy (example: all conductors located in one electrical manhole).

3.2.13.3.3. Review surge protection needs from primary spikes and on secondary systems throughout the plant.

3.2.13.3.4. Evaluate replacement of existing primary switchgear (Manufacturer: S&C) for Argo and Hobart power sources.

3.2.13.3.5. Consider locating new primary switchgear in a new Electrical Building. Develop potential locations for the building.

3.2.13.3.6. Consider addition of ATS for the Blue substation as part of the manual main-tie-main configuration.

3.2.13.3.7. Develop a redundancy scheme. Consider a medium voltage loop as an option.

3.2.13.3.8. Identify electrical system needs for different integrated treatment trains.

3.2.13.3.9. Summarize findings and recommendations in **Technical Memorandum 3.2.10**.

3.2.14. **Task 3.2.11** Miscellaneous Considerations (Auxiliary Systems and Facilities)

3.2.14.1. The purpose of this subsection is to capture any additional significant improvements that will either impact the Plant 1 rehabilitation or will be impacted by the construction.

3.2.14.2. Develop solutions to address the shortcomings from the process-focused risk assessment described in Task 3.1.

3.2.14.3. Consider possible miscellaneous improvements:

3.2.14.3.1. Improved traffic routes on site for both the construction phase and permanent long-term operations, for example, a drive through the plant (connecting Pomona drive to Sunset Delivery drive).

3.2.14.3.2. Relocated chemical feed systems and/or bulk chemical storage - Identify, evaluate and develop initial cost for alternative location(s) for chemical storage on the site map that improve operational ease, access and safety without compromising treatment performance.

3.2.14.3.2.1. Evaluate relocation of NaOCl and ammonia feed after UV disinfection.

3.2.14.3.2.2. Evaluate if pH adjustment should be provided after the filters.

3.2.14.3.2.3. Evaluate if covered storage should be provided for bulk chemicals.

3.2.14.3.2.4. Evaluate if the existing Ammonia Building location is in conflict with other proposed improvements.

3.2.14.3.3. Develop initial cost to demolish the existing sludge storage tanks.

3.2.14.3.4. Develop initial cost for repair or replace and relocate sludge thickeners as needed for a reconfigured plant site.

3.2.14.3.5. Evaluate building use and the need for building modifications including possible additions or reallocation of spaces (maintenance, office space, process lab, welding shop, storage, covered work truck parking) and develop initial cost.

3.2.14.3.5.1. Note: Demolition of Carbon House necessitates new metal/weld shop, office space, sludge and dewatering pumps.

3.2.14.3.6. Develop initial cost for replacement of buried ozone effluent isolation valves.

3.2.14.3.7. Desktop evaluation of yard piping on the WTP site for suitability for reliable service and location. Develop initial reconfigured yard piping as needed to accommodate new or reconfigured processes.

3.2.14.3.8. Security – Develop initial cost to incorporate the recommendations from the AWIA Risk and Resiliency Assessment (being conducted separately by the City).

3.2.14.3.9. Information Technology – Develop initial cost for a plant-wide uninterrupted power supply (UPS) plan with the goals of reducing the number of smaller UPSs, developing standards, reviewing critical equipment to backup, and incorporating new equipment from the SCADA Improvements Project.

3.2.14.3.10. Conduct up to two workshops with the City in the development of alternatives for miscellaneous facilities and auxiliary systems.

3.2.14.4. Summarize miscellaneous consideration improvements in **Technical Memorandum 3.2.11**.

3.2.15. **Task 3.2.12** Decision Making to Evaluate Alternatives for WTP Improvements.

3.2.15.1. The technical memoranda from the previous tasks serve as the basis of the holistic review of the integrated treatment trains under evaluation in this task. To prepare for the holistic review, each technical memorandum will include the consideration of impacts for upstream and downstream processes.

3.2.15.2. Build holistic treatment alternatives for WTP improvements based on the outcomes from Tasks 3.1 and Tasks 3.2.1 to 3.2.11.

3.2.15.3. Facilitate a series of four workshops with the City that are reflective of the iterative decision-making framework used to arrive at the preferred approach.

3.2.15.4. **Workshop 3.2A** – Develop Integrated Treatment Alternatives.

3.2.15.4.1. Collate findings from Tasks 3.2.1-11 to build integrated treatment train alternatives for further detailed evaluation in Part 1. Present options noted during initial reviews within this process to finalize the trains to be detailed for analysis using the decision framework.

3.2.15.4.2. Document assumptions and process narrative for each integrated treatment train alternative as part of **Technical Memorandum 3.2.12**.

3.2.15.5. **Workshop 3.2B** – Evaluate Alternatives Part 1.

3.2.15.5.1. Evaluate alternatives (first attempt) using the decision-making framework of Task 3.1 and evaluation criteria and weightings selected from engagement with the community.

3.2.15.5.2. Remove obvious outliers from further consideration, consistent with the framework for decision making described in Task 3.1.

3.2.15.5.3. Estimate costs, constraints, and opportunities of implementation for each integrated treatment train alternative.

3.2.15.5.4. Note that it is our understanding that the fundamental infrastructure systems that need upgrading and that represent the greatest space need and opportunity for change are the electrical system and chemical storage and metering systems.

3.2.15.5.5. Summarize outcomes as part of **Technical Memorandum 3.2.12**.

3.2.15.6. **Workshop 3.2C** – Evaluate Alternatives Part 2.

3.2.15.6.1. Refine the evaluation of integrated treatment alternatives (second attempt) to address other infrastructure and logistical needs in response to the process risk review of Task 3.1 and other upgrades or modifications to ancillary facilities and equipment (Task 3.2.11) that would potentially affect implementation and/or costs.

3.2.15.6.2. Rank alternatives with respect to “best value”, defined as using the “Benefit-to-Cost Ratio”. The “Benefit” offered by each alternative would be scored qualitatively using a decision model.

The numerical “Benefit” score derived from the decision model would then be divided by the projected 25-year life cycle cost of the alternative to derive a “Benefit-to-Cost Ratio” for that alternative.

3.2.15.6.3. Subject evaluation to sensitivity analysis to identify what conditions would cause a change in outcome.

3.2.15.6.4. Summarize outcomes as part of **Technical Memorandum 3.2.12.**

3.2.15.7. **Workshop 3.2D** – Develop Preferred Approach for Plant 1 Rehabilitation.

3.2.15.7.1. Convene a workshop with the City to use the results from the second evaluation, sensitivity analysis and best value determination to arrive at the preferred approach for the 50 year long-term facility plan and what this means for the Plant 1 rehabilitation. The objective of this workshop is to seek alignment with the City on the path forward before presenting the recommended solution for WTP improvements and next steps with a broader audience of City stakeholders.

3.2.15.7.2. Document findings, conclusions and recommendations and the decisions used to arrive at the preferred approach as part of **Technical Memorandum 3.2.12**. This presents the overall package for the Plant 1 rehabilitation, including:

3.2.15.7.2.1. Implementation schedule for improvements.

3.2.15.7.2.2. Class 4 Opinion of Probable Cost

3.2.15.7.2.3. Lifecycle costs.

3.2.15.7.2.4. Capital Improvement Plan (CIP).

3.2.15.7.2.5. Rate impacts.

3.2.15.7.2.6. Redundancy strategy.

3.2.15.8. Coordinate stakeholder review and city engagement consistent with the CEAP developed during Task 3.1.

3.2.16. **Task 3.2.13** Part 12 Reliability Study

3.2.16.1. Meet with the City and gather existing information containing:

3.2.16.1.1. Existing population, number of service connections/equivalent residential units.

3.2.16.1.2. Existing production and consumption data for 5- and 20-year planning periods for average day, maximum day, peak hour, and fire flow demands.

3.2.16.1.3. Monthly and annual production flows from surface and groundwater sources.

3.2.16.1.4. Annual water sales to other water supplies.

3.2.16.1.5. Annual usage totals for each customer classification as defined by the City (example: residential, commercial, industrial, institution, etc.).

3.2.16.1.6. A water shortage response plan for emergencies.

3.2.16.1.7. Basis for the withdrawal capacity rating from Barton Pond.

3.2.16.1.8. Capacity of the groundwater supply.

3.2.16.2. Review existing data and reports for the information needed to complete the reliability study per Administrative Rules Part 12.

3.2.16.3. Update population and demand projections from the previous Master Plan.

3.2.16.4. Prepare **Draft Reliability Study** for City review and comment.

3.2.16.5. Revise study based upon City's comments and submit to EGLE for review.

3.2.16.6. Update document with comments and prepare **Final Reliability Study**. Submit to City for submission to EGLE.

3.2.17. Task 3.2 Development/Evaluation of Alternatives Allowances.

3.2.17.1. Design interim system upgrades and implement upgrades to support full-scale capacity testing of Plant 2, upon request.

3.2.17.2. Attend to and review results in the event that the PSUs or generators need to be retested.

3.2.17.3. Prepare and participate in additional workshop with City staff to support the development and evaluation of alternatives.

END OF TASK 3.2

3.3. Task 3.3 Community Engagement

3.3.1. Task 3.3 includes one task:

3.3.1.1. **Task 3.3.1** Public Engagement

3.3.2. **Task 3.3.1** Public Engagement

3.3.2.1. Subcontract the services of a Public Engagement Expert, The Huron River Group, to lead and perform Task 3.3 in general and items 3.3.2.4 to 3.3.2.10. These activities are separate from the strategic planning phase, and specifically include:

3.3.2.1.1. Citizen Advisory Committee.

3.3.2.1.2. General public activities.

3.3.2.1.3. Focus groups.

3.3.2.1.4. Executive Leadership Team.

3.3.2.1.5. Staff and internal stakeholders.

3.3.2.1.6. External stakeholders.

3.3.2.1.7. Record, analyze and present outcomes.

3.3.2.2. Provide technical assistance and support as needed to the Public Engagement Expert.

3.3.2.2.1. Provide materials and facilitate public meetings with the City as described under Task 3.3.

3.3.2.2.2. Provide technical support and display material content to support the Public Engagement Expert consistent with the Community Engagement Action Plan developed by the Public Engagement Expert for this project, including display materials and presentations for different audiences.

3.3.2.2.3. Prepare project updates and materials for the City-maintained public website offering status reports to the public. Prepare updates and materials for other social media outlets consistent with the Community Engagement Action Plan developed by the Public Engagement Expert for this project.

3.3.2.3. Follow the City's Public Engagement Toolbox for public engagement efforts.

3.3.2.4. Citizen Advisory Committee.

3.3.2.4.1. Conduct five regular meetings with the Citizen Advisory Committee to seek public engagement and buy-in. A regular meeting model for the key stakeholder group ensures that the closest stakeholders are fully informed of the project status and have ample opportunities to provide feedback to influence decisions. For each meeting, prepare minutes, analyze and communicate feedback. Members for this group will be agreed upon by the project team, possibilities to include:

3.3.2.4.1.1. Water activists involved in the Gelman plume litigation.

3.3.2.4.1.2. Large water customers such as the microbrew industry, the University of Michigan and M-Medicine.

3.3.2.4.1.3. A diversity, equity and inclusion advocate.

3.3.2.4.1.4. A representative resident/ratepayer.
3.3.2.4.1.5. City representatives such as a City Manager staff member.
3.3.2.4.1.6. Higher level political representative such as State or Federal representative staffer(s).
3.3.2.4.1.7. Project team members from the Water Treatment Services Unit and/or their Engineer.
3.3.2.4.1.8. Representative(s) of the Equity and Engagement Steering Committee.

3.3.2.5. General public activities.
3.3.2.5.1. Provide 28 community engagement events/meetings and other activities as summarized in this section. Confirm the list of events/meetings with the City during the development of the Community Engagement Action Plan.
3.3.2.5.2. Provide two formal public meetings and attend three community events. The two public meetings will include:
3.3.2.5.2.1. Public Meeting One: Town Hall Introduction to address (1) an overview of the project deliverables, schedule, ways to stay informed, (2) introductions to the project team including the Engineer and key City and project leaders, (3) presentation of the alternatives, (4) interactive activity.
3.3.2.5.2.2. Public Meeting Two: Town Hall Post Task 3.2 or 3.4 to address (1) recap project schedule, staff, ways to stay informed, key alternatives; (2) presentation of key findings with Q&A; (3) interactive activity.
3.3.2.5.3. Interactive activities might include:
3.3.2.5.3.1. Moving around the room to vote with sticky dots on which elements of the plans are most important to the stakeholder.
3.3.2.5.3.2. Breaking into teams to discuss and draw pictures on large paper of desired outcomes from the project deliverable – and then sharing with the group the drawings and what they mean in terms of desired outcomes.
3.3.2.5.3.3. Choosing from a generous selection of printed images depicting possible features or alternatives, and creating collages from those photos that are most appealing.
3.3.2.5.4. Attend up to three community events with the public, to be selected in collaboration with the project team.
3.3.2.5.4.1. Choose from possibilities that include Earth Day, MLK Day, the Dance for Mother Earth PowWow, the Ypsilanti Beer Fest, the Art Fairs Townie Party, and Top of the Park. Arrange with event organizers to set up an information table and (1) offer activities and incentives to approach the table, (2) sign people up to receive project updates, participate in focus groups and public meetings, (3) hand out printed info and tell people about the project and answer their questions. The following is a table of public events from which the City will select the three events:

Community Events	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Art Fairs Townie Party							X					
Black History Month		X										
Dance for Mother Earth PowWow			X									
Earth Day				X								
Farmers Market					X	X	X	X	X	X	X	
Top of the Park						X						
Ypsilanti BrewFest							X					

3.3.2.5.5. Prepare materials and agenda, schedule and facilitate the meetings as appropriate. Synthesize large amounts of material in a way that is easily understood yet comprehensive and accurate. Support these engagement activities by advertising, writing press releases, and calendar listings. The Public Engagement Expert will participate in internal work sessions and coordination meetings with the project team in preparation of public engagement activities.

3.3.2.5.6. Conduct and analyze an on-line survey with the general public, beginning six to eight months into the project timeline. Work with the project team (City and Engineer) to develop survey questions. Collect contact information for interested persons at the outset of the project, starting with utility bill recipients and City subscribers and expanded via publicity activities. Parameters of the survey, such as how long to leave it open and whether results will be instantly viewable, will be developed with the project team.

3.3.2.6. Focus groups.

3.3.2.6.1. Conduct up to five targeted focus groups to obtain feedback from historically underrepresented groups in collaboration with the City's Equitable Engagement Advisory Committee, doing direct outreach to Ann Arbor advocacy organizations, and using the Public Engagement Expert's local network. Working with the Public Engagement Expert's Ann Arbor network, identify and schedule focus groups, with up to eight attendees each so each voice can be heard. (Other community engagement activities will capture broad participation.) Prepare question prompts in advance, although anticipate that the focus group discussions will focus on water-related urgent presenting issues. If directed by the City, provide gift card incentives for focus group participants. Include a translator for one of the five focus group sessions.

3.3.2.7. Executive Leadership Team or City Leaders.

3.3.2.7.1. City leaders are the ultimate and key decisionmakers on the project. They must be fully engaged, have opportunities for feedback, and ultimately decide on the preferred alternative. At the same time, leadership have very limited time available with multiple competing priorities. Establishing a subcommittee of trusted and engaged City Council members as part of the Executive Leadership Team is recommended for more frequent engagements. Provide a total of three presentations to the Executive Leadership Team:

3.3.2.7.1.1. One at the outset to communicate the overall project objectives, timeline and meeting the team.

3.3.2.7.1.2. One at the six-month mark to provide project updates at a City Council meeting.

3.3.2.7.1.3. One at the one-year mark to provide a report with a recommended preferred alternative.

3.3.2.7.1.4. Assume that the information prepared for these meetings will be public record and create content for a press release highlighting the information shared and any feedback.

3.3.2.7.1.5. Effort on this task requires significant input from the Engineer and other key stakeholders.

3.3.2.7.2. Be available to respond to questions and concerns by the public at the City Council meetings. The public will have many opportunities for engagement with the project at other times throughout the year, and their feedback will be fully integrated into the plan recommendations.

3.3.2.7.3. The Council Subcommittee will consist of two to three members and will meet five times, coordinated with the Citizens Advisory Committee meetings. The Council Subcommittee meetings will be no more than one hour, with a maximum of a half-hour to present information and a half-hour for an exchange of ideas. If desired, this Council Subcommittee could be replaced with a subcommittee of the Equity and Engagement Steering Committee.

3.3.2.7.4. Council members will have opportunities for two-way feedback every six weeks or so throughout the first year, including the Council Subcommittee (five meetings) and full Council updates (three). City leaders will of course be invited to the public meetings and will have an opportunity to participate in the engagement activities then, if they choose. (Replacing the Council Subcommittee with an Equity and Engagement Steering Subcommittee would reduce direct City Council engagement.)

3.3.2.8. Staff and internal stakeholders.

3.3.2.8.1. Staff buy-in is one of the most important success factors for any plan – strategic or facilities. Hold up to two staff and internal stakeholder town hall style meetings, and attend an additional two regular staff meetings. (Alternatively, attend up to four regularly scheduled meetings if holding two special all-staff meetings for this project is too costly for the City). The meeting schedule could parallel the public engagement town hall meetings. Because of the high organizational cost of all-staff meetings, we are prepared to limit any special meeting to no more than one to two hours at the City's discretion. Hearing from the staff and recording their comments is important because of the impact project decisions have on staff, because of their deep expertise in the topic area, and because staff buy-in is important to later project success. The meetings will consist of one hour of two-way feedback, where information is shared and staff immediately are invited to

comment. Offer the public engagement activity to the staff as well, because the public engagement activities are an excellent approach to obtaining and quantifying feedback on staff priorities and preferences.

3.3.2.8.2. Build into this time follow-up contacts with any staff member who wishes to communicate more fully. The Public Engagement Expert places a high priority on ensuring that every voice in a stakeholder meeting can be heard, which can sometimes mean scheduling one-on-one time with very active participants like staff members, either after the meeting or later. Based on the experience of the Public Engagement Expert, staff and internal stakeholders are most likely to require follow-up.

3.3.2.9. External stakeholders.

3.3.2.9.1. Include support for up to four meetings with external stakeholders, such as the State of Michigan Department of Environment, Great Lakes and Energy (EGLE). These meetings require a lower level of effort because they tend to be more focused on the specific requirements of the external stakeholder. We estimate a total of ten hours for each of these four meetings, including scheduling, setting the agenda, and facilitating the meeting.

3.3.2.10. Record and analyze outcomes.

3.3.2.10.1. Analyze the results of each of the stakeholder meetings. Prepare minutes, and record feedback using a quantitative matrix. For the public engagement exercises, document meeting artifacts, such as project maps with sticky dots, collages or drawings by converting these to charts and tables for presentation to the Citizen Advisory Committee and project team. Quantify comments by a simple comment count. Include content for public information/marketing on social media, project web site, and press releases

3.3.2.10.2. The purpose of recording and analyzing outcomes is to ensure that key information is integrated into the planning process, to provide guidance in valuing and weighting assessment criteria, and ultimately to result in sustainable decisions with broad buy-in.

3.3.3. Task 3.3 Public Engagement Allowances.

3.3.3.1. Provide virtual room for distribution of public information upon user's request. For an example of a virtual room see https://consultation.ai/demo/ .

3.3.3.2. Provide gift cards for participants in surveys or outreach per the CEAP and request by City.

3.3.3.3. Develop and maintain an external facing project website connected to or accessible from the City's website.

END OF TASK 3.3

3.4. Task 3.4 Project Management and Administration of Implementation.

3.4.1. Task 3.4 includes six sub tasks:

3.4.1.1. **Task 3.4.1** Demonstration Testing.

3.4.1.1.1. Full-scale testing of Plant 2.

3.4.1.1.2. Pilot testing of single stage softening with a solids contact clarifier.

3.4.1.1.3. Jar testing to assess calcium carbonate hexahydrate occurrence and control.

3.4.1.2. **Task 3.4.2** Advancing the WTP Improvements, including multi-discipline engineering features.

3.4.1.3. **Task 3.4.3** Funding.

3.4.1.4. **Task 3.4.4** Permitting.

3.4.1.5. **Task 3.4.5** Community Engagement.

3.4.1.6. **Task 3.4.6** Project Planning and Preliminary Basis of Design.

3.4.2. **Task 3.4.1** Demonstration Testing

3.4.2.1. Undertake testing to validate the sustainability of single-stage lime-caustic softening at the WTP.. Test Plant 2 operations to confirm capacity and water quality anticipated during construction of the Plant 1 rehabilitation. Pilot test to confirm design criteria and performance for single-stage lime-caustic softening.

3.4.2.1.1. Conduct Full-Scale Testing (see **Task 3.4.1A**). This would involve testing Plant 2 operations to confirm peak capacity and water quality performance under a variety of raw water quality scenarios as determined in **Task 3.2.3**.

3.4.2.1.2. Conduct Pilot Scale Testing (see **Task 3.4.1B**). This would involve the mobilization of temporary pilot testing facilities to simulate single stage softening using solids contact clarifiers, followed by recarbonation, ozonation and filtration. Perform jar testing as part of pilot testing plans.

3.4.2.1.3. Perform jar testing if CCH formation is observed during the pilot testing period.

3.4.2.2. **Task 3.4.1A** Full-Scale Testing.

3.4.2.2.1. Plan and carry out full scale testing using Plant 2. Test to as high a hydraulic loading rate as can practically be achieved while managing variations in daily water demands. Assume City staff will operate the facility during the full-scale testing.

3.4.2.2.2. Develop written experimental and operational plans for the City to implement including slow incremental changes in operations. Meet with City operators to introduce testing objectives, discuss expectations, and describe operational plans during the full-scale trial.

3.4.2.2.3. Liaise with EGLE to inform the agency and receive approval for the full-scale trial of Plant 2. It has been assumed for the purposes of this proposal that two x 3-month test periods would be undertaken to meet EGLE requirements and satisfy the overall

objectives of the testing. See sub-task 3.4.4 (Permitting) for interaction with EGLE on full-scale demonstration plan approval.

3.4.2.2.4. Review weekly summary of results; assumed as a one-hour phone call. Any required adjustments to test protocols would be discussed and agreed upon during these calls.

3.4.2.2.5. Monitor the test results over two x 3-month test periods (i.e., six months total operation). Test periods would be deliberately established to coincide with “warm weather” and “cold weather” operations. AECOM staff will visit the WTP once per week to liaise with City operators and discuss any issues arising during testing.

3.4.2.2.6. Compile results, analyses, discussion, conclusions and recommendations into **Technical Memorandum 3.4.1A.**

3.4.2.3. **Task 3.4.1B** Pilot Testing.

3.4.2.3.1. Conduct a pilot test to emulate the operation of a single-stage lime-caustic softening process using solids contact clarification. Include recarbonation, ozonation, and water supply to the existing pilot filtration system, to allow assessments of the potential impact of a switch to single-stage softening process on the long term sustainability of plant operations.

3.4.2.3.2. Develop a detailed, written experimental plan, documenting the objectives of the work, metrics to be used for measuring success, means and methods. Develop written operational plans. Meet with City operators to introduce testing objectives, discuss expectations, and describe operational plans during the pilot testing.

3.4.2.3.3. Liaise with EGLE to receive approval on a pilot testing plan with objectives, protocols, testing and outcomes to be demonstrated. It has been assumed that the pilot plant will be operated up to 12 months of pilot testing (to capture warm and cold water conditions) to satisfy the objectives of pilot testing. See sub-task 3.4.4 (Permitting) for interaction with EGLE on pilot testing plan approval.

3.4.2.3.4. Develop a design for the proposed pilot plant, to include all pilot testing and ancillary equipment including housing, HVAC (as required), electrical and utility connections. Although it is intended that the pilot plant will be a temporary facility, it is assumed that the pilot plant would be constructed mostly as a stand-alone facility, i.e., not within existing WTP building, and would be fully housed and protected against the elements. The only exception will be the pilot filter columns. It is assumed that these columns will remain in their present location within the WTP, and that the proposed pilot plant will include facilities to pump ozonated water over to the pilot filters.

3.4.2.3.5. Assume that the pilot plant would be constructed assuming a 13-month total period. This will include rental contracts for any equipment required for the pilot plant, to secure the availability of

such equipment for the full 12-month operating period plus two weeks for start-up and shutdown. An allowance is identified toward the purchase of permanent equipment. The final purchase cost of the pilot equipment can be settled with the City with a project change order. Any amount over the allowance will paid for by the City and any value under the allowance listed will be credited to the City. This change order will be agreed upon prior to final pilot equipment purchase.

3.4.2.3.6. Develop a procurement strategy for the pilot plant, assuming a combination of rented and purchased pilot equipment, Make use of the existing filter pilot columns at the WTP, if feasible.

3.4.2.3.7. Develop a Request for Proposals for Pilot Testing to document the scope, roles, responsibilities, and terms and conditions that will govern the rental of pilot plant equipment. For example, participation in the pilot plant does not imply any commitment for the City to purchase the equipment for full-scale implementation.

3.4.2.3.8. Coordinate and complete the physical construction of the pilot plant, including the hiring of contractors complying with the City's procurement requirements as they apply to AECOM, to physically complete the construction work, and including rental of any equipment required for the pilot plant. The pilot plant is assumed to include:

3.4.2.3.9. Chemical feed systems and chemicals for testing including lime, caustic, carbon dioxide, polymer, and potential coagulants. All chemical dosing systems would be designed with appropriate secondary containment for safety.

3.4.2.3.10. Heated enclosure for the pilot system, with flooring suitable for pilot operations.

3.4.2.3.11. Water supply to be pumped from WTP influent to pilot unit not to exceed 200 gpm. It is assumed that water is pumped from an open channel. It is assumed above ground route is selected to the pilot unit with up to three personnel bridges over the piping. There are no road or driveway crossings anticipated.

3.4.2.3.12. A solids contact clarifier pilot system for single-stage lime-caustic softening, with integrated control systems and remote operation capabilities.

3.4.2.3.13. Recarbonation system sized for no less than 10 gpm with integrated control systems.

3.4.2.3.14. Ozone system sized for no less than 10 gpm to treat water for pilot filtration system.

3.4.2.3.15. Ozonated water collection and pumping system to transfer ozonated water to the pilot filter columns located within the WTP;

3.4.2.3.16. Provide general equipment for operations including safety equipment, bench testing equipment, and tools for general operation of the system.

3.4.2.3.17. Instrumentation and controls deemed necessary for routine ongoing monitoring and control of the pilot plant, including at least:

3.4.2.3.17.1. Raw water flow, pH, and temperature

3.4.2.3.17.2. Softened water (post solids contact clarifier) pH and temperature

3.4.2.3.17.3. Recarbonated water pH and temperature

3.4.2.3.17.4. Ozonated water flow and ozone-in-liquid residual

3.4.2.3.17.5. Filter feed water flow

3.4.2.3.18. Coordinate connections to the pilot plant:

3.4.2.3.18.1. Raw water supply to the pilot plant

3.4.2.3.18.2. Waste connections: The pilot plant is expected to generate waste at three discrete locations:

- Sludge blowdown from the solids contact clarifier
- Excess flow after recarbonation not required for filtration
- Filtered Water

3.4.2.3.18.3. The design will include facilities to capture and discharge these wastes, either by gravity or pumping.

3.4.2.3.19. Pump to filters from ozone treatment discharge.

3.4.2.3.20. 100 amp single phase electrical service extension from the WTP to the pilot . Power for pilot unit paid by the utility.

3.4.2.3.21. Complete start-up and commissioning of the pilot plant.

3.4.2.3.22. Conduct operations of the pilot plant. It is assumed for the purposes of this proposal that the pilot plant will generally be designed to operate 24 hours a day to facilitate stable operating performance for up to 12 months. AECOM staff would staff and operate the pilot plant 5 days per week (Monday to Friday, excluding holidays), with City operations staff monitoring the pilot plant when AECOM staff are not physically present.

3.4.2.3.23. Review weekly summary of results; assumed as a one-hour phone call. Any required adjustments to test protocols would be discussed and agreed upon during these calls.

3.4.2.3.24. Plan and carry out jar testing. Complete concurrently with pilot testing, as needed, for chemical feed optimization prior to pilot start-up, and also during operations to make adjustments as necessary.

3.4.2.3.25. Complete monthly pilot testing summary memoranda.

3.4.2.3.26. Complete draft and final pilot testing report, as **Technical Memorandum 3.4.1B.**

3.4.2.4. Task 3.4.1C Calcium Carbonate Hexahydrate Jar Testing.

3.4.2.4.1. In the event that CCH formation does occur at the Ann Arbor WTP, undertake jar testing to assess the feasibility of potential mitigation strategies to combat CCH formation, including blending with groundwater for temperature mitigation. Perform jar testing in both two-stage mode and single-stage lime-caustic mode to assess how the lime dosing strategy impacts performance.

3.4.3. **Task 3.4.2** Advancing the WTP Improvements.

3.4.3.1. **Task 3.4.2.A** Electrical Improvements.

3.4.3.1.1. Advance the electrical improvements technical memorandum from Task 3.2 to 10% preliminary basis of design, for the switchgear line up and new electrical building size, proposed one-line diagram for the electrical system architecture.

3.4.3.1.2. Conduct **Workshop 3.4A** with the City during 10% design development of electrical improvements.

3.4.3.2. Treatment Processes.

3.4.3.2.1. Advance the recommended treatment process additions and/or modifications from Task 3.2 and conclusions drawn from testing in Task 3.4 to 10% preliminary basis of design.

3.4.3.3. **Task 3.4.2B** Miscellaneous Considerations (Ancillary Systems and Facilities).

3.4.3.3.1. Advance the work in Task 3.2 to refine, prioritize, schedule and thoughtfully integrate miscellaneous upgrades into Plant 1 rehabilitation and Water Systems Facility Plan for the following:

3.4.3.3.2. Improve traffic routes on site for both the construction phase and permanent long-term operations.

3.4.3.3.3. Relocate chemical feed systems and/or bulk chemical storage. Update the preliminary concept from Task 3.2 and develop the 10% design for the selected alternative for bulk chemical storage.

3.4.3.3.4. Update the plan to demolish the existing sludge storage tanks and refine cost.

3.4.3.3.4.1. Further develop to 10% design and cost for selected alternative for sludge thickening, based on the preliminary approach in Task 3.2.

3.4.3.3.5. Further develop from Task 3.2 need for building modifications including possible additions or reallocation of spaces and develop 10% design and refined costs for the selected alternative.

3.4.3.3.6. Further develop potential yard piping modifications identified in Task 3.2 to 10% design and cost.

3.4.3.3.7. Evaluate the need and scope to renovate the Process Lab.

3.4.3.3.8. Security – Refine concept and cost to 10% design to incorporate the recommendations from the AWIA Risk and Resiliency Assessment (being conducted separately by the City).

3.4.3.3.9. Information Technology:

3.4.3.3.9.1. Refine preliminary concept from Task 3.2 for the plant-wide UPS plan with the goals of reducing the number of smaller UPSs, developing standards, reviewing critical equipment to backup, and incorporating new equipment from the SCADA Improvements Project. Further develop to 10% design and refine cost for the selected alternatives.

3.4.3.3.9.2. Evaluate and recommend internal plant networking (Cat5 and fiber cabling).

3.4.3.3.9.3. Develop conceptual plan for allocating space for future telecom equipment relocated from the WTP rooftops and a new telecom tower.

3.4.3.3.10. Address LEED and other sustainability considerations.

3.4.3.3.10.1. Review potential large- and small-scale sustainability opportunities and create business case evaluation. Perform quantitative analysis and conceptually locate if applicable.

3.4.3.3.11. Address any additional ideas or considerations raised while carrying out Tasks 3.1, 3.2 and 3.3.

3.4.3.3.12. Conduct **Workshop 3.4B** with the City during 10% design development of miscellaneous facilities and auxiliary systems.

3.4.3.4. Summarize outcomes in **Technical Memorandum 3.4.2**.

3.4.4. **Task 3.4.3** Funding.

3.4.4.1. Develop cost estimates for:

3.4.4.1.1. A refined cost estimate for the selected alternatives and final recommendations.

3.4.4.1.2. A total project cost estimate including administrative, engineering, bonding, legal, permitting, construction and contingency costs.

3.4.4.1.3. Provide Class 4 Level engineering cost estimates (+50%, -30%) as defined by AACE.

3.4.4.2. Prepare Annual Cash Flow Projection through anticipated construction completion, considering factors affecting annual spend.

3.4.4.2.1. From current date to completion of construction.

3.4.4.2.2. The purpose of this effort is to assist with establishing fiscal year budgets.

3.4.4.2.3. Site constraints may limit the amount of construction that can take place in a given year. Prepare cash flow projections with consideration to how much can be physically constructed with the limited access and the site restrictions.

3.4.4.2.4. Coordinate with the City's financial team to determine rate impacts to the City's customers.

3.4.4.3. Prepare State of Michigan Drinking Water State Revolving Fund (DWSRF) Project Plan.

3.4.4.3.1. Prepare and submit DWSRF Project Plan

3.4.4.3.2. Include all effort necessary to meet all EGLE requirements for submission and approval.

3.4.4.3.3. Use available information from the City including DWSRF Project Plan for the 2018 Ultraviolet Disinfection System and other prior projects.

3.4.4.3.4. Prepare the advertisement and presentation for the Public Hearing.

3.4.4.3.5. Attend and present at the Public Hearing.

3.4.4.3.6. Participate in conference calls with EGLE as necessary.

3.4.4.3.7. Prepare in coordination with the City the Submittal of DWSRF Application Part I.

3.4.4.4. WIFIA funding.

3.4.4.4.1. Investigate and present requirements (such as American Iron&Steel Act, environmental review, application fees and timing.)

3.4.4.4.2. Develop schedule, milestones, road map for securing WIFIA funding.

3.4.4.4.3. Determine if WIFIA and DWRF can work in conjunction or if limitations exist.

3.4.4.4.4. Prepare and submit the Letter of Interest for WIFIA funding. Application fee for WIFIA to be paid by the City.

3.4.4.4.5. Prepare and submit the WIFIA application if selected to apply for a WIFIA loan.

3.4.4.5. Investigate and present other possible sources of funding.

3.4.4.6. Summarize findings of scope above in **Technical Memorandum 3.4.3**.

3.4.5. **Task 3.4.4** Permitting.

3.4.5.1. Engage with and seek approval from EGLE on a bench, pilot and/or full-scale demonstration plan with objectives, protocols, testing, outcomes to be demonstrated, and schedule.

3.4.5.2. Conduct quarterly meetings with EGLE to present data from testing and discuss results.

3.4.5.3. Allow for one initial meeting, four data review meetings and report submission meeting with EGLE.

3.4.5.4. Document discussions and direction in **Technical Memorandum 3.4.4**.

3.4.5.5. Submit **draft Preliminary Basis of Design Report** to EGLE. See Task 3.4.6 for the development of the Preliminary Basis of Design Report.

3.4.5.6. Respond to EGLE questions and comments and revise Preliminary Basis of Design as necessary.

3.4.5.7. Submit final Preliminary Basis of Design Report to EGLE.

3.4.6. **Task 3.4.5** Community Engagement.

3.4.6.1. Provide one update to the public and City Council regarding project activities using written and virtual delivery (for example an update to describe any changes to the scope of capital improvements, schedule and/or cost estimates) and consistent with the Community Engagement Plan.

3.4.7. **Task 3.4.6** Project Planning and Preliminary Basis of Design Report.

3.4.7.1. Prepare **Preliminary Basis of Design Report** for the recommended alternative the Plant 1 rehabilitation. Use the technical memoranda from Task 3.2 and develop the design to approximately 10 percent to set the stage for the implementation as part of the future Progressive Design Build project.

3.4.7.2. Document the following in the **Preliminary Design Basis Report**: preliminary flows and loads and other basic design criteria as well as a description of the main processes; conceptual site plan with 10% design process unit and building footprints, process flow diagram and simplified process and instrumentation drawing (i.e., detailed flow diagram with

major equipment, piping, valves, most instrumentation without the “top half” of a P&ID with I/O and control logic).

3.4.7.3. Prepare an updated plant process piping, drainage piping, utility piping and electrical runs drawing for the treatment plant site and streets adjacent to the site. Information for this effort to be obtained from plant records and as-built drawings, and does not include subsurface utility engineering (SUE).

3.4.7.4. Prepare planning recommendations, guidelines and strategies. Document in **Technical Memorandum 3.4.6**.

3.4.7.4.1. Develop master project schedule (from study phase through construction and commissioning). Incorporate the current Capital Improvement Plan projects in the master schedule. Identify critical tasks that may take an extraordinary length of time or effort. Identify risks to the schedule that the City may not have control of.

3.4.7.4.2. Investigate off-site storage areas. Prioritize the recommendations. Develop a phasing plan and conceptual schedule for Preparatory work, Near-Term work (i.e. Plant 1 rehabilitation), Intermediate, Long-Term Implementation. The phased work shall also be reflected in a Cash Flow Projection table, and graphically in site layout sketches.

3.4.7.4.3. Prepare a Risk Register and an assessment of the constructability of the project.

3.4.7.4.4. Provide recommendations for staffing requirements.

3.4.7.4.4.1. Identify staffing requirements needed during the design and construction phases.

3.4.7.4.4.2. Discuss how the changes will impact current plant staffing levels, including the need for additional technicians.

3.4.7.5. Conduct a series of three workshops with the City to support the development of the Project Plan (**Technical Memorandum 3.4.6**) and **Preliminary Basis of Design**.

3.4.7.5.1. **Workshop 3.4C** – Preliminary Basis of Design.

3.4.7.5.1.1. Summary of preliminary basis of design for i) short-term improvements (for example, Plant 1 rehabilitation and ii) key elements of the Water Systems Facility Plan for the duration of the planning horizon.

3.4.7.5.2. **Workshop 3.4D** – Master Schedule, Construction Sequencing, Risk Register, and Staffing.

3.4.7.5.2.1. Master Schedule for Water Systems Facility Plan with applicable items existing CIP incorporated and potential risks identified.

3.4.7.5.2.2. Project phasing report for 50-year Water Systems Facility Plan. Include Plant 1 rehabilitation and Plant 2 rehabilitation.

3.4.7.5.2.3. Construction sequencing plan.

3.4.7.5.2.4. Risk Register of constructability.

3.4.7.5.2.5. Staffing recommendations for design, construction and operation phases.

3.4.7.5.3. **Workshop 3.4E** – Final Project Presentation.

3.4.7.5.3.1. Presentation of final Basis of Design Report and Project Plan for the Water Systems Facility Plan.

3.4.7.5.3.2. Include with the **Preliminary Basis of Design Report** Preparation and Deliverable:

3.4.7.5.3.2.1. Prepare an Executive Summary as part of the Report.

3.4.7.5.3.2.2. Prepare a separate one-page fact sheet, with graphics treatment suitable for distribution to the public.

3.4.7.6. Prepare presentation on the **Basis of Design Report and Project Plan** for the Water Systems Facility Plan for City Council.

3.4.7.7. Prepare a separate list of final recommended improvements to be used as a basis for the PDB RFP. Provide six (6) hard copies, 3-ring binders for City files. Additional hard copies as required for DWSRF, WIFIA, EGLE, other stakeholders, etc.

3.4.8. Task 3.4 Project Management and Administration for Implementation Allowances.

3.4.8.1. Cost for trades to connect electrical, instrumentation and controls for pilot system.

3.4.8.2. Cost for trades to connect chemical feed systems and chemicals for pilot system

3.4.8.3. Costs for decommissioning of the pilot plant and restore the site.

3.4.8.4. Purchase or rental costs for the following process units for the pilot system:

3.4.8.4.1. Recarbonation equipment for pilot system.

3.4.8.4.2. Ozone pilot system purchase or rental.

3.4.8.4.3. Pilot system pumps.

3.4.8.4.4. Pilot system sitework and site piping.

3.4.8.4.5. Pilot system building and recarbonation tankage.

3.4.8.5. Analytical costs:

3.4.8.5.1. Analytical costs to support full-scale testing of Plant 2 (Task 3.4.1A) that cannot be performed by the pilot plant operator in the field or by the City's lab services. Analytical needs are defined in the experience plan developed in Task 3.2.

3.4.8.5.2. Analytical costs to support pilot testing (Task 3.4.1B) that cannot be performed by the pilot plant operator in the field or by the City's lab services. Analytical needs are defined in the experience plan developed in Task 3.2.

3.4.8.6. Cost to add one additional month of piloting operations is $35,000 per month. Similarly, this amount will be deducted for each month the pilot operations is reduced.

3.4.8.7. Prepare presentation on the **Basis of Design Report** and **Project Plan for the Water Systems Facility Plan** for City Council, consistent with the CEAP.

END OF TASK 3.4

4. Assumptions

4.1. Summary of Expectations for City Involvement:

4.1.1. Collaborate and participate in project management meetings and workshops.
4.1.2. Identify staff for inclusion in workshops, meetings, submittal reviews, etc.
4.1.3. Review draft technical memos, reports, and presentations within two (or three) weeks of submission depending on the nature of the submission.
4.1.4. Provide consolidated review comments and check for conflicts in the comments.
4.1.5. Arrange meeting rooms; virtual meetings can be hosted by AECOM.
4.1.6. Provide access to background information, O&M staff, and facilities.
4.1.7. Complete pre-workshop worksheets that will be used to solicit questions/input and provoke ideas before attending the workshop; review materials provided in advance of the workshop; engage as an active workshop participant.
4.1.8. Support pilot testing; this may involve grab sampling and SCADA reports, logging observations and operational changes of the full-scale plant, and participating in monthly performance reviews.
4.1.9. If needed, collect additional grab samples and analyze water quality as requested by the project team to evaluate (individual) process performance.
4.1.10. Provide support for the full-scale testing of Plant 2 (summer, winter) including reviewing/accepting test plans, scheduling the tests, collecting grab samples, analyzing water quality, and make operational adjustments to support testing.
4.1.11. Participate in planning meeting in advance of meetings with EGLE to confirm scope and messaging.
4.1.12. Participate in planning and meetings to support the Community Engagement Action Plan:
    4.1.12.1. Engagement with City leaders.
        4.1.12.1.1. Four presentations:
            4.1.12.1.1.1. At outset.
            4.1.12.1.1.2. Project updates (2).
            4.1.12.1.1.3. Final report.
        4.1.12.1.2. Not to exceed four hours total per participant.
    4.1.12.2. Staff buy-in.
        4.1.12.2.1. The Public Engagement Expert is available to attend up to four City staff meetings, with flexibility to attend regularly scheduled meetings or hold special meetings as desired.
            4.1.12.2.1.1. Kick-off.
            4.1.12.2.1.2. Key deliverables.
            4.1.12.2.1.3. Summary.
        4.1.12.2.2. Planned at up to eight total hours per participant.
            4.1.12.2.2.1. Potential to require follow-up; based on level of active participation for each individual staff member.
    4.1.12.3. Background documentation.
    4.1.12.4. On an as-needed basis, email and phone communication.

4.2. Summary of Expectations for AECOM

4.2.1. Conduct and facilitate meetings and workshops including the preparation of agendas, meeting minutes, summary of decisions, action items, etc.

4.2.2. Provide electronic files of all deliverables. Editable files and .pdf.

4.2.3. Establish a document management system.

4.2.3.1. Provide all files from the document management system on a thumb drive at the completion of the project.

4.2.4. Set up and maintain a publicly-accessible project web page. Prepare materials and periodic updates for posting on web page linked from City's website.

4.2.5. Provide related deliverables necessary to complete the work, including but not limited to:

4.2.5.1. PowerPoint presentations, cost estimates, basis of designs, technical memos, model runs if applicable, schedules, agendas, etc.

4.2.6. Manage procurement and supply of equipment for full-scale testing and/or pilot testing using a provisional allowance. Rental of equipment (e.g., pilot plant equipment).

4.2.7. Operate the pilot plant. It has been assumed for the purposes of this proposal that 12 months of piloting will be undertaken, with operations by AECOM staff 8-hours per day, 5 days per week, for a total of 48 weeks. It is assumed that wherever practical, routine analytical testing required to support the pilot (including jar testing, pH and temperature measurements, or analyses that use Hach testing kits) would be performed by AECOM staff, using the City's laboratory facilities.

4.2.8. Capital cost estimates developed during this work would be either Class 4 or Class 5 cost estimates, appropriate to the level of detail to which a given alternative has been developed. Class 5 estimates are considered appropriate at a screening level for determining which alternatives would be considered sufficiently feasible to carry forward during an analysis. For any alternatives short-listed, it is assumed that alternatives would be carried to an approximate 10% design, and would have Class 4 cost estimates developed to aid in decision making.

4.2.9. Review up to 20 ozone system submittals and RFIs and witness an operational test, a controls test, and a power performance test for the ozone system.

4.3. Costs Assumed for City of Ann Arbor

4.3.1. The Scope of Services includes various Specific Allowances identified. Specific Allowance means funds that are included in the Total Agreement Price for specific Scope of Services tasks that are either 1) generally known to be required for the project but whose level of effort is unknown until after select items of the Scope of Services have been performed, 2) pre-identified optional tasks that may or may not be required to complete the project as contemplated, or 3) Equipment that is to be purchased or rented and the cost will be passed along to the City of Ann Arbor. Ultimate ownership of purchased equipment will be the City of Ann Arbor. Use of the Specific Allowances are only as directed by the City of Ann Arbor for the Owner's purposes and only by a directive from the City that indicates the amount to be charged to the allowance. If cost for the task is more than the Specific Allowance, AECOM will either 1)revise their level of effort to fall within the Specific Allowance funds, or 2) submit a Change Order for additional funds for the complete level of effort.

4.3.2. City expenses associated with public engagement are estimated at less than $5,000. The Public Engagement Expert (HRG) plans to insert information into a water bill as soon as possible after the project kicks off, inviting water customers to sign up for email/electronic updates on the project. The cost of the utility mailing assumes $0.20 production cost for 50,000 customers. If a separate mailing for the purpose is required, the cost will be higher.

4.3.3. The assumptions for estimated costs for the City include:

Translation services	Use existing City services
Utility mailing insert to approximately 50,000 customers	Use existing distribution channels (e.g., bill stuffer)
Miscellaneous materials production	$2,000
Social media paid advertising	$2,000

4.4. Exclusions

4.4.1.

4.4.2. PFAS testing as described in Task 3.2.7 for Total Oxidizable Precursor Assay of the source water, PFASA analysis of sediment samples within Barton Pond, PFASA analysis for fish from the Huron River if not available from existing sources. AECOM could provide these additional sampling services under a separate authorization if data is not available.

4.4.3. WIFIA, DWSRF and any other funding application fees.

4.4.4. Consumables for pilot testing, including treatment chemicals, testing reagents, electrical power, and any fuels required to heat facilities. The cost of consumables for pilot testing are addressed by expenses ($700/week).

4.4.5. Utilities for pilot and full-scale testing, including supply piping for feed water, drainage connections for handling wastes, and electrical power supply.

4.4.6. Full-scale testing of Plant 1.

4.4.7. Ozone system electrical feed infrastructure will not be updated. All electrical equipment upgrades will meet NEC and NFPA codes.

4.4.8. Modifications to the existing ozone system cooling are assumed to not be necessary to accommodate the upgrades to the new ozone equipment.

4.4.9. Suez is responsible for all cable rerouting between the PSU and generators.

4.4.10. Risk and resilience reviews will not follow J100 and are limited in scope to exclude review of natural or man-made disasters and focuses on redundancy of service and process operations.

4.4.11. Existing facility analysis and condition assessment other than electrical, process equipment and major concrete tanks within the alternative analysis are not included in this scope of services and no HVAC, plumbing, architectural, or structural reviews will be conducted within the existing facilities. An assessment of the remaining service life of major process equipment and tankage is included to identify opportunities to support the development and evaluation of alternatives.

4.4.12. Updating of the existing drawings for yard piping and other buried utilities on the plant site will be derived from review of existing as-built drawings and other documentation already produced for the site, along with visual field observation. Scope does not include subsurface utility engineering (SUE).

END OF SECTION 4.

EXHIBIT B

COMPENSATION

General

Contractor shall be paid for those Services performed pursuant to this Agreement inclusive of all reimbursable expenses (if applicable), in accordance with the terms and conditions herein. The Compensation Schedule below/attached states nature and amount of compensation the Contractor may charge the City:

(insert/Attach Negotiated Fee Arrangement)

Engineering Services for Water Systems Facility Plan - RFP# 20-04
City of Ann Arbor - Public Services Area - Water Treatment Plant

Estimated Work Hours and Fees

		Q. Muylwyk Project Manager and Task 3.1 Lead	T. McCaan Assistant PM	K. Johnson Liaison to Public Engagement	C. Hill QA/QC Manager	J. Yanchula HS&E	S. Breese Task 3.2 Lead (Softening, Residuals)	B. Green Task 3.3 Lead	W. Clunie Risk and Operations	L. Willnow Supply Alternatives and System Hydraulics	J. Krinks/ T.Brodeur Process (Softening)	A. Gebeau Process (Disinfection, 1,4-Dioxane, Chem Systems)	C. Curran Emerging Contaminants (PFAS)	T. McCann Process (Wastewater Residuals)	J. Finnegan Constructability, Project Planning, Cost Estimating	C. Laucamp Rates, Demands, Mechanical, Pumping/ Hydraulics	A. Greige Electrical Engineer	Various Sr Discipline Engineers	Various Jr Engineers and Project Engineering	Various Admin. Support	Total Hours	Total Labor	Direct Expenses			TOTAL
																						Allowances	Subs	Lodging/ Travel/ Document Production/ Pilot Consumables	
Task	**Direct Expenses for the life of project for travel**																			**0**	$ -	$ -	$ 12,000.00	$ -	$ 12,000.00
	Direct Expenses for the life of project for travel (HRG)																				$ -		$ 12,000.00		$ 12,000.00
Task	**3.1 - Strategic Planning**																			**970**	$ 215,979.90	$ 55,000.00	$ 37,850.00	$ 500.00	$ 304,329.90
3.1.1	Project management, kickoff (two parts), four monthly meetings, SharePoint setup & maintenance	60	60		8	8													56	30	222	$ 44,181.00				$ 44,181.00
3.1.2	Executive Leadership role advisory	24	16	40															16	16	112	$ 25,078.80				$ 25,078.80
3.1.3	Leadership direction setting meeting	8		8																4	20	$ 4,959.60			$ 500.00	$ 5,459.60
3.1.4A	Review background information	8	32				8	8											40	4	100	$ 18,699.60		$ 20,325.00		$ 39,024.60
3.1.4B	Determine future water demands	4														16			40	4	64	$ 10,003.80				$ 10,003.80
3.1.5	Conduct and facilitate strategic planning initiative (Workshops 3.1A to D)	46	46	80	16		60	24	16		24	24							40	16	392	$ 96,485.70				$ 96,485.70
3.1.6	Develop Community Engagement Action Plan (CEAP)	12	8	40																	60	$ 16,571.40		$ 17,525.00		$ 34,096.40
3.1.7	Strategic planning allowance for presentation to Council																				0		$ 25,000.00			$ 25,000.00
3.1	Additional workshop allowance																						$ 5,000.00			
3.1	Task 3.1 misc. items allowance																						$ 25,000.00			$ 25,000.00
Task	**3.2 - Alternatives Development and Evaluation**																			**2752**	$ 564,186.60	$ 190,000.00	$ -	$ 8,000.00	$ 762,186.60
	Project management, six monthly meetings, and SharePoint maintenance	24	40			40													48	40	192	$ 30,238.80				$ 30,238.80
3.2.1	Advance 2015 Alternatives Report including softening and supply alternatives	12	12		4		8	8	40		40									4	128	$ 32,285.40				$ 32,285.40
3.2.2	Review softening technologies	4	8		4		8				40								40	4	108	$ 21,859.80				$ 21,859.80
3.2.3	Evaluate conversion to single stage softening and Plant 2 capacity pilot plan	4	8		4		20	16		8	24							16	80	4	184	$ 35,509.80				$ 35,509.80
3.2.4	Develop disinfection and oxidation strategy, including permanent LT2 approach	4	8					8				60							20	4	104	$ 18,511.80			$ 1,000.00	$ 19,511.80
3.2.4A	Ozone RFI and submittal support and testing support preconstruction	4	8									40						100	40		192	$ 35,587.80	$ 10,000.00		$ 1,000.00	$ 46,587.80
3.2.5	Identify potential treatment needs for 1,4-dioxane	4	8					8				60							20	4	104	$ 18,511.80			$ 1,000.00	$ 19,511.80
3.2.6	Develop long term PFAS treatment options	4	8					4					60							4	80	$ 22,219.80				$ 22,219.80
3.2.7	Identify potential treatment needs for other emerging contaminants	4	8									40								4	56	$ 10,507.80				$ 10,507.80
3.2.8	Evaluate additional sodium hydroxide needs and concept	4	8								24								16	4	56	$ 11,203.80				$ 11,203.80
3.2.9	Evaluate WWTP disposal needs	4	8										16	40						4	72	$ 17,539.80				$ 17,539.80
3.2.10	Evaluate and recommend electrical improvements	4	8														120		80	4	216	$ 38,467.80			$ 500.00	$ 38,967.80
3.2.11	Identify needs for auxiliary facilities and equipment	8	16					24			24	8	16	8	16	16	8	40	120	4	308	$ 58,215.60			$ 500.00	$ 58,715.60
3.2.12	Develop alternatives for integrated treatment trains (Workshop 3.2A)	24	16	8	8		16	16			24	24	24					24	80	4	268	$ 56,878.80				$ 56,878.80
	Evaluate alternatives, part 1 (Workshop 3.2B)	16	16	8	8		16	16			24										104	$ 28,807.20			$ 1,000.00	$ 29,807.20
	Evaluate alternatives, part 2 (Workshop 3.2C)	24	24	8	8		16	8			24				8	8					128	$ 34,606.80			$ 1,000.00	$ 35,606.80
	Review results and identify preferred approach (Workshop 3.2D)	16	16	8	8		12	8			8	4	4		4	4					92	$ 25,249.20			$ 1,000.00	$ 26,249.20
	Prepare presentation of results to City stakeholders (Workshop 3.2E)	16	16	8			12	8													60	$ 16,081.20			$ 1,000.00	$ 17,081.20
3.2.13	Part 12 Reliability Study	8	40					80											160	12	300	$ 51,903.60				$ 51,903.60
3.2	Allowance for modifications/equipment updates to Plant 2 to accommodate full-scale testing																						$ 100,000.00			$ 100,000.00
3.2	Additional workshop allowance																						$ 5,000.00			$ 5,000.00
3.2	Task 3.2 misc. items allowance																						$ 75,000.00			$ 75,000.00
Task	**3.3 - Community Engagement**																			**268**	$ 71,056.80	$ 77,500.00	$ 110,200.00	$ 500.00	$ 259,256.80
	Project management, meetings	16	16																		32	$ 8,239.20				$ 8,239.20
	Support City's Public Engagement firm (assume five public meetings, including materials)	8	8	60																	76	$ 21,039.60				$ 21,039.60
	Participate in Public Advisory Committee (assume six meetings)	4	24	24				4													56	$ 14,359.80			$ 500.00	$ 14,859.80
	Prepare and participate in meetings with City stakeholders (assume nine meetings)	36	36	16				16													104	$ 27,418.20				$ 27,418.20
	Public engagement, and record and analyze outcomes																				0	$ -		$ 110,200.00		$ 110,200.00
3.3A	Develop, update and maintain virtual room for community engagement																				0	$ -	$ 40,000.00			$ 40,000.00
3.3A	Develop external facing project website																				0	$ -	$ 20,000.00			$ 20,000.00
3.3A	Allowance for gift cards used during outreach																				0	$ -	$ 2,500.00			$ 2,500.00
3.3	Task 3.3 misc. items allowance																						$ 15,000.00			$ 15,000.00
Task	**3.4 - Phase 2 Project Management and Administration**																			**9214**	$ 1,423,516.50	$ 2,187,750.00	$ -	$ 111,200.00	$ 3,722,466.50
	Project management, twelve monthly meetings, and SharePoint maintenance	88	60			24		24											96	80	372	$ 66,747.60				$ 66,747.60
3.4.1A	Full-scale testing																				0	$ -				$ -
	Develop operational plan						16	8			4	16		2			2	2	80	80	210	$ 28,032.00				$ 28,032.00
	Coordination with planning meeting, start-up, daily and weekly calls for six months	40			4		66					90							102	60	362	$ 64,995.00	$ 15,000.00		$ 1,500.00	$ 81,495.00
	Create a pilot test report						12					40						2	120	80	254	$ 31,542.00			$ 100.00	$ 31,642.00
	Present report and EGLE pre and post test meetings	8	4				8	16				8						8	40	40	132	$ 21,027.60			$ 300.00	$ 21,327.60
3.4.1B	Pilot demonstration testing																					$ -				$ -
	Develop operational plan						16	8			4	32		2			2	2	80	80	226	$ 30,912.00				$ 30,912.00
	EGLE pre and post test meetings	8	4				8	24				8						8	40	40	140	$ 23,211.60			$ 300.00	$ 23,511.60
	Design pilot unit system and building.						40	40				40					80	120	320	120	760	$ 118,500.00			$ 2,000.00	$ 120,500.00
	Electrical and I&C improvements for pilot																120		80		200	$ 35,160.00	$ 206,250.00			$ 241,410.00
	Procure/install chemical feed pilot equipment																	8	40	20	68	$ 7,920.00	$ 137,500.00			$ 145,420.00
	Procure/install softening pilot equipment																	8	40	20	68	$ 7,920.00	$ 731,500.00			$ 739,420.00
	Procure/install recarbonation pilot equipment																	8	40	20	68	$ 7,920.00	$ 41,250.00			$ 49,170.00
	Procure/install ozone pilot equipment																	8	40	20	68	$ 7,920.00	$ 687,500.00			$ 695,420.00
	Procure/install pumping pilot systems																	8	40	20	68	$ 7,920.00	$ 27,500.00			$ 35,420.00
	Sitework and piping to connect pilot plant																	8	40	20	68	$ 7,920.00	$ 41,250.00			$ 49,170.00
	Prefabricated building and recarbonation tank																	8	40	20	68	$ 7,920.00	$ 165,000.00			$ 172,920.00
	Construction oversight																	48	480	20	548	$ 65,160.00			$ 19,200.00	$ 84,360.00
	Pilot testing operations (12 months assumed, including consumables and weekly updates)	48	24		12		48	8				120						272	2000	24	2556	$ 342,993.60	$ 30,000.00		$ 81,600.00	$ 454,593.60
	Pilot test report						32					40						2	120	80	274	$ 37,212.00			$ 100.00	$ 37,312.00
	Pilot plant decommissioning																				0	$ -	$ 30,000.00		$ 100.00	$ 30,100.00
3.4.2	Advancing alternative for WTP improvements	8	4				8	8			24					8	8	24	220	4	316	$ 47,391.60				$ 47,391.60
	Electrical improvements (Workshop 3.3A)		8				2	8									40		120		178	$ 26,607.00				$ 26,607.00
	Auxiliary facilities and equipment improvements (Workshop 3.3B)	8	16				4	40			40	24					24	24	120		300	$ 56,085.60				$ 56,085.60
3.4.3	Develop multiple cost estimates over course of project	8			16			24			16				70				120		254	$ 49,041.60				$ 49,041.60
	Develop annual cash flow projections and assess rate impacts				2			24								40			40	4	110	$ 22,254.00				$ 22,254.00
	Prepare DWRF Project Plan and Part 1 App.; advertise and present at public hearing	24	32					60											120		236	$ 43,834.80				$ 43,834.80
	Identify and apply other funding sources (i.e., WIFIA)	8	32					40											80		160	$ 29,247.60				$ 29,247.60
3.4.4	Coordination with EGLE	8	8					24											80	4	124	$ 19,911.60				$ 19,911.60
3.4.5	Community engagement (follow-up)	12	8																	8	28	$ 6,011.40				$ 6,011.40
3.4.6	Prepare preliminary basis of design (Workshop 3.3C)	8	8		8		8	24			24				8	24	24	120	160		416	$ 78,459.60			$ 1,000.00	$ 79,459.60
	Develop master project schedule (included in Workshop 3.3D)	8	8		4			16			8				24						68	$ 17,715.60			$ 1,000.00	$ 18,715.60
	Develop project phasing and construction sequencing plans (included in Workshop 3.3D)	8	12					16							40						76	$ 18,615.60			$ 1,000.00	$ 19,615.60
	Prepare risk register (included in Workshop 3.3D)	8	16					16							24						64	$ 15,807.60			$ 1,000.00	$ 16,807.60
	Recommend staffing requirements (included in Workshop 3.3D)	2	4					16							16						38	$ 9,537.90			$ 1,000.00	$ 10,537.90
	Prepare report, final recommendations, fact sheet, summary (Workshop 3.3E)	48	48		8		8	24			20				16				80	84	336	$ 62,061.60			$ 1,000.00	$ 63,061.60
3.4	Task 3.4 misc. items allowance																				0	$ -	$ 75,000.00			$ 75,000.00
	Total Hours	**764**	**818**	**308**	**122**	**72**	**452**	**724**	**56**	**8**	**396**	**678**	**120**	**52**	**226**	**116**	**428**	**868**	**5874**	**1122**	**13,204**		**$ 2,510,250.00**	**$ 160,050.00**	**$ 120,200.00**	**$ 5,060,239.80**

EXHIBIT C
INSURANCE REQUIREMENTS

From the earlier of the Effective Date or the Commencement Date of this Agreement, and continuing without interruption during the term of this Agreement, Contractor shall have, at a minimum, the following insurance and insurance listed in Exhibit D, including all endorsements necessary for Contractor to have or provide the required coverage.

A. The Contractor shall have insurance that meets the following minimum requirements:

1. Professional Liability Insurance or Errors and Omissions Insurance protecting the Contractor and its employees in an amount not less than $1,000,000.

2. Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

   Bodily Injury by Accident - $500,000 each accident
   Bodily Injury by Disease - $500,000 each employee
   Bodily Injury by Disease - $500,000 each policy limit

3. Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 04 13 or current equivalent. The City of Ann Arbor shall be an additional insured. There shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. Further, the following minimum limits of liability are required:

$1,000,000	Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined
$2,000,000	Per Project General Aggregate
$1,000,000	Personal and Advertising Injury

4. Motor Vehicle Liability Insurance equivalent to, as a minimum, Insurance Services Office form CA 00 01 10 13 or current equivalent. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. The City of Ann Arbor shall be an additional insured. There shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. Further, the limits of liability shall be $1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

5. Umbrella/Excess Liability Insurance shall be provided to apply in excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of $1,000,000.

B. Insurance required under A.3 and A.4 above shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance

the City does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City for any insurance listed herein.

C. Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and demonstrate an unconditional and unqualified 30-day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number(s); name of insurance company; name(s), email address(es), and address(es) of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions, which may be approved by the City in its sole discretion; (c) that the policy conforms to the requirements specified. Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. If any of the above coverages expire by their terms during the term of this Agreement, the Contractor shall deliver proof of renewal and/or new policies and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.

EXHIBIT D
GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

The contract documents shall be signed in 2 copies by the City and the Contractor.

The contract documents are complementary and what is called for by any one shall be binding. The intention of the documents is to include all labor and materials, equipment and transportation necessary for the proper execution of the work. Materials or work described in words which so applied have a well-known technical or trade meaning have the meaning of those recognized standards.

In case of a conflict among the contract documents listed below in any requirement(s), the requirement(s) of the document listed first shall prevail over any conflicting requirement(s) of a document listed later.

(1) Professional Services Agreement (including Exhibits A, B, and C); (2) RFP 20-04; (3) Addenda in reverse chronological order; (4) Detailed Specifications; (5) Standard Specifications; (6) Plans; (7) General Conditions; (8) Bond Forms.

Section 2 - Order of Completion

The Contractor shall submit with each invoice, and at other times reasonably requested by the Supervising Professional, schedules showing the order in which the Contractor proposes to carry on the work. They shall include the dates at which the Contractor will start the several parts of the work, the estimated dates of completion of the several parts, and important milestones within the several parts.

Section 3 - Familiarity with Work

The Contractor or its representative shall make personal investigations of the site of the work and of existing structures and shall determine to its own satisfaction the conditions to be encountered, the nature of the ground, the difficulties involved, and all other factors affecting the work proposed under this Contract. The Contractor will not be entitled to any additional compensation unless conditions are clearly different from those which could reasonably have been anticipated by a person making diligent and thorough investigation of the site.

The Contractor shall immediately notify the City upon discovery, and in every case prior to submitting its Proposal, of every error or omission in the Proposal that would be identified by a reasonably competent, diligent Contractor. In no case will Contractor be allowed the benefit of extra compensation or time to complete the work under this Contract for extra expenses or time spent as a result of the error or omission.

Section 4 - Wage Requirements

Under this Contract, the Contractor shall conform to Chapter 14 of Title I of the Code of the City of Ann Arbor as amended; which in part states "...that all craftsmen, mechanics and laborers employed directly on the site in connection with said improvements, including said employees of subcontractors, shall receive the prevailing wage for the corresponding classes of craftsmen, mechanics and laborers, as determined by statistics for the Ann Arbor area compiled by the United States Department of Labor. At the request of the City, any contractor or subcontractor shall provide satisfactory proof of compliance with the contract provisions required by the Section.

Pursuant to Resolution R-16-469 all public improvement contractors are subject to prevailing wage and will be required to provide to the City payroll records sufficient to demonstrate

compliance with the prevailing wage requirements. A sample Prevailing Wage Form is provided in the Appendix herein for reference as to what will be expected from contractors. Use of the Prevailing Wage Form provided in the Appendix section or a City-approved equivalent will be required along with wage rate interviews.

Where the Contract and the Ann Arbor City Ordinance are silent as to definitions of terms required in determining contract compliance with regard to prevailing wages, the definitions provided in the Davis-Bacon Act as amended (40 U.S.C. 278-a to 276-a-7) for the terms shall be used.

If the Contractor is a "covered employer" as defined in Chapter 23 of the Ann Arbor City Code, the Contractor agrees to comply with the living wage provisions of Chapter 23 of the Ann Arbor City Code. The Contractor agrees to pay those employees providing Services to the City under this Contract a "living wage," as defined in Section 1:815 of the Ann Arbor City Code, as adjusted in accordance with Section 1:815(3); to post a notice approved by the City of the applicability of Chapter 23 in every location in which regular or contract employees providing services under this Contract are working; to maintain records of compliance; if requested by the City, to provide documentation to verify compliance; to take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee or person contracted for employment in order to pay the living wage required by Section 1:815; and otherwise to comply with the requirements of Chapter 23.

Contractor agrees that all subcontracts entered into by the Contractor shall contain similar wage provision covering subcontractor's employees who perform work on this contract.

Section 5 - Non-Discrimination

The Contractor agrees to comply, and to require its subcontractor(s) to comply, with the nondiscrimination provisions of MCL 37.2209. The Contractor further agrees to comply with the provisions of Section 9:158 of Chapter 112 of Title IX of the Ann Arbor City Code, and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity.

Section 6 - Materials, Appliances, Employees

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary or used for the execution and completion of the work. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and materials shall be of the highest quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

The Contractor shall at all times enforce strict discipline and good order among its employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned.

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

The Contractor shall employ competent laborers and mechanics for the work under this Contract. For work performed under this Contract, employment preference shall be given to qualified local residents.

Section 8 - Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringements of any patent rights and shall hold the City harmless from loss on account of infringement except that the City shall be responsible for all infringement loss when a particular process or the product of a particular manufacturer or manufacturers is specified, unless the City has notified the Contractor prior to the signing of the Contract that the particular process or product is patented or is believed to be patented.

Section 9 - Permits and Regulations

The Contractor must secure and pay for all permits, permit or plan review fees and licenses necessary for the prosecution of the work. These include but are not limited to City building permits, right-of-way permits, lane closure permits, right-of-way occupancy permits, and the like. The City shall secure and pay for easements shown on the plans unless otherwise specified.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the contract documents are at variance with those requirements, it shall promptly notify the Supervising Professional in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work.

Section 10 - Protection of the Public and of Work and Property

The Contractor is responsible for the means, methods, sequences, techniques and procedures of construction and safety programs associated with the work contemplated by this contract. The Contractor, its agents or sub-contractors, shall comply with the "General Rules and Regulations for the Construction Industry" as published by the Construction Safety Commission of the State of Michigan and to all other local, State and National laws, ordinances, rules and regulations pertaining to safety of persons and property.

The Contractor shall take all necessary and reasonable precautions to protect the safety of the public. It shall continuously maintain adequate protection of all work from damage, and shall take all necessary and reasonable precautions to adequately protect all public and private property from injury or loss arising in connection with this Contract. It shall make good any damage, injury or loss to its work and to public and private property resulting from lack of reasonable protective precautions, except as may be due to errors in the contract documents, or caused by agents or employees of the City. The Contractor shall obtain and maintain sufficient insurance to cover damage to any City property at the site by any cause.

In an emergency affecting the safety of life, or the work, or of adjoining property, the Contractor is, without special instructions or authorization from the Supervising Professional, permitted to act at its discretion to prevent the threatened loss or injury. It shall also so act, without appeal, if authorized or instructed by the Supervising Professional.

Any compensation claimed by the Contractor for emergency work shall be determined by agreement or in accordance with the terms of Claims for Extra Cost - Section 15.

Section 11 - Inspection of Work

The City shall provide sufficient competent personnel for the inspection of the work.

The Supervising Professional shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for access and for inspection.

If the specifications, the Supervising Professional's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Supervising Professional timely notice of its readiness for inspection, and if the inspection is by an authority other than the Supervising Professional, of the date fixed for the inspection. Inspections by the Supervising Professional shall be made promptly, and where practicable at the source of supply. If any work should be covered up without approval or consent of the Supervising Professional, it must, if required by the Supervising Professional, be uncovered for examination and properly restored at the Contractor's expense.

Re-examination of any work may be ordered by the Supervising Professional, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to be in accordance with the contract documents, the City shall pay the cost of re-examination and replacement. If the work is not in accordance with the contract documents, the Contractor shall pay the cost.

Section 12 - Superintendence

The Contractor shall keep on the work site, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Supervising Professional. The superintendent will be responsible to perform all on-site project management for the Contractor. The superintendent shall be experienced in the work required for this Contract. The superintendent shall represent the Contractor and all direction given to the superintendent shall be binding as if given to the Contractor. Important directions shall immediately be confirmed in writing to the Contractor. Other directions will be confirmed on written request. The Contractor shall give efficient superintendence to the work, using its best skill and attention.

Section 13 - Changes in the Work

The City may make changes to the quantities of work within the general scope of the Contract at any time by a written order and without notice to the sureties. If the changes add to or deduct from the extent of the work, the Contract Sum shall be adjusted accordingly. All the changes shall be executed under the conditions of the original Contract except that any claim for extension of time caused by the change shall be adjusted at the time of ordering the change.

In giving instructions, the Supervising Professional shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Supervising Professional, and no claim for an addition to the Contract Sum shall be valid unless the additional work was ordered in writing.

The Contractor shall proceed with the work as changed and the value of the work shall be determined as provided in Claims for Extra Cost - Section 15.

Section 14 - Extension of Time

Extension of time stipulated in the Contract for completion of the work will be made if and as the Supervising Professional may deem proper under any of the following circumstances:

(1) When work under an extra work order is added to the work under this Contract;

(2) When the work is suspended as provided in Section 20;

(3) When the work of the Contractor is delayed on account of conditions which could not have been foreseen, or which were beyond the control of the Contractor, and which were not the result of its fault or negligence;

(4) Delays in the progress of the work caused by any act or neglect of the City or of its employees or by other Contractors employed by the City;

(5) Delay due to an act of Government;

(6) Delay by the Supervising Professional in the furnishing of plans and necessary information;

(7) Other cause which in the opinion of the Supervising Professional entitles the Contractor to an extension of time.

The Contractor shall notify the Supervising Professional within 7 days of an occurrence or conditions which, in the Contractor's opinion, entitle it to an extension of time. The notice shall be in writing and submitted in ample time to permit full investigation and evaluation of the Contractor's claim. The Supervising Professional shall acknowledge receipt of the Contractor's notice within 7 days of its receipt. Failure to timely provide the written notice shall constitute a waiver by the Contractor of any claim.

In situations where an extension of time in contract completion is appropriate under this or any other section of the contract, the Contractor understands and agrees that the only available adjustment for events that cause any delays in contract completion shall be extension of the required time for contract completion and that there shall be no adjustments in the money due the Contractor on account of the delay.

Section 15 - Claims for Extra Cost

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work-Section I3. No claim shall be valid unless so made.

If the Supervising Professional orders, in writing, the performance of any work not covered by the contract documents, and for which no item of work is provided in the Contract, and for which no unit price or lump sum basis can be agreed upon, then the extra work shall be done on a Cost-Plus-Percentage basis of payment as follows:

(1) The Contractor shall be reimbursed for all reasonable costs incurred in doing the work, and shall receive an additional payment of 15% of all the reasonable costs to cover both its indirect overhead costs and profit;

(2) The term "Cost" shall cover all payroll charges for employees and supervision required under the specific order, together with all worker's compensation, Social Security, pension and retirement allowances and social insurance, or other regular payroll charges on same; the cost of all material and supplies required of either temporary or permanent character; rental of all power-driven equipment at agreed upon rates, together with cost of fuel and supply charges for the equipment; and any costs incurred by the Contractor as a direct result of executing the order, if approved by the Supervising Professional;

(3) If the extra is performed under subcontract, the subcontractor shall be allowed to compute its charges as described above. The Contractor shall be permitted to add an additional charge of 5% percent to that of the subcontractor for the Contractor's supervision and contractual responsibility;

(4) The quantities and items of work done each day shall be submitted to the Supervising Professional in a satisfactory form on the succeeding day, and shall be approved by the Supervising Professional and the Contractor or adjusted at once;

(5) Payments of all charges for work under this Section in any one month shall be made along with normal progress payments. Retainage shall be in accordance with Progress Payments-Section 16.

No additional compensation will be provided for additional equipment, materials, personnel, overtime or special charges required to perform the work within the time requirements of the Contract.

When extra work is required and no suitable price for machinery and equipment can be determined in accordance with this Section, the hourly rate paid shall be 1/40 of the basic weekly rate listed in the Rental Rate Blue Book published by Dataquest Incorporated and applicable to the time period the equipment was first used for the extra work. The hourly rate will be deemed to include all costs of operation such as bucket or blade, fuel, maintenance, "regional factors", insurance, taxes, and the like, but not the costs of the operator.

Section 16 - Progress Payments

The Contractor shall submit each month, or at longer intervals, if it so desires, an invoice covering work performed for which it believes payment, under the Contract terms, is due. The submission shall be to the City's Finance Department - Accounting Division. The Supervising Professional will, within 10 days following submission of the invoice, prepare a certificate for payment for the work in an amount to be determined by the Supervising Professional as fairly representing the acceptable work performed during the period covered by the Contractor's invoice. To insure the proper performance of this Contract, the City will retain a percentage of the estimate in accordance with Act 524, Public Acts of 1980. The City will then, following the receipt of the Supervising Professional's Certificate, make payment to the Contractor as soon as feasible, which is anticipated will be within 15 days.

An allowance may be made in progress payments if substantial quantities of permanent material have been delivered to the site but not incorporated in the completed work if the Contractor, in the opinion of the Supervising Professional, is diligently pursuing the work under this Contract. Such materials shall be properly stored and adequately protected. Allowance in the estimate shall be at the invoice price value of the items. Notwithstanding any payment of any allowance, all risk of loss due to vandalism or any damages to the stored materials remains with the Contractor.

In the case of Contracts which include only the Furnishing and Delivering of Equipment, the payments shall be; 60% of the Contract Sum upon the delivery of all equipment to be furnished, or in the case of delivery of a usable portion of the equipment in advance of the total equipment delivery, 60% of the estimated value of the portion of the equipment may be paid upon its delivery in advance of the time of the remainder of the equipment to be furnished; 30% of the Contract Sum upon completion of erection of all equipment furnished, but not later than 60 days after the date of delivery of all of the equipment to be furnished; and payment of the final 10% on final completion of erection, testing and acceptance of all the equipment to be furnished; but not later than l80 days after the date of delivery of all of the equipment to be furnished, unless testing has been completed and shows the equipment to be unacceptable.

With each invoice for periodic payment, the Contractor shall enclose a Contractor's Declaration - Section 43, and an updated project schedule per Order of Completion - Section 2.

Section 17 - Deductions for Uncorrected Work

If the Supervising Professional decides it is inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made.

Section 18 - Correction of Work Before Final Payment

The Contractor shall promptly remove from the premises all materials condemned by the Supervising Professional as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract and without expense to the City and shall bear the expense of making good all work of other contractors destroyed or damaged by the removal or replacement.

If the Contractor does not remove the condemned work and materials within l0 days after written notice, the City may remove them and, if the removed material has value, may store the material at the expense of the Contractor. If the Contractor does not pay the expense of the removal within 10 days thereafter, the City may, upon 10 days written notice, sell the removed materials at auction or private sale and shall pay to the Contractor the net proceeds, after deducting all costs and expenses that should have been borne by the Contractor. If the removed material has no value, the Contractor must pay the City the expenses for disposal within 10 days of invoice for the disposal costs.

The inspection or lack of inspection of any material or work pertaining to this Contract shall not relieve the Contractor of its obligation to fulfill this Contract and defective work shall be made good. Unsuitable materials may be rejected by the Supervising Professional notwithstanding that the work and materials have been previously overlooked by the Supervising Professional and accepted or estimated for payment or paid for. If the work or any part shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good the defect in a manner satisfactory to the Supervising Professional. The judgment and the decision of the Supervising Professional as to whether the materials supplied and the work done under this Contract comply with the requirements of the Contract shall be conclusive and final.

Section 19 - Acceptance and Final Payment

Upon receipt of written notice that the work is ready for final inspection and acceptance, the Supervising Professional will promptly make the inspection. When the Supervising Professional finds the work acceptable under the Contract and the Contract fully performed, the Supervising Professional will promptly sign and issue a final certificate stating that the work required by this Contract has been completed and is accepted by the City under the terms and conditions of the Contract. The entire balance found to be due the Contractor, including the retained percentage, shall be paid to the Contractor by the City within 30 days after the date of the final certificate.

Before issuance of final certificates, the Contractor shall file with the City:

(1) The consent of the surety to payment of the final estimate;
(2) The Contractor's Affidavit in the form required by Section 44.

In case the Affidavit or consent is not furnished, the City may retain out of any amount due the Contractor, sums sufficient to cover all lienable claims.

The making and acceptance of the final payment shall constitute a waiver of all claims by the City except those arising from:

(1) unsettled liens;
(2) faulty work appearing within 12 months after final payment;
(3) hidden defects in meeting the requirements of the plans and specifications;
(4) manufacturer's guarantees.

It shall also constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

Section 20 - Suspension of Work

The City may at any time suspend the work, or any part by giving 5 days notice to the Contractor in writing. The work shall be resumed by the Contractor within 10 days after the date fixed in the written notice from the City to the Contractor to do so. The City shall reimburse the Contractor for expense incurred by the Contractor in connection with the work under this Contract as a result of the suspension.

If the work, or any part, shall be stopped by the notice in writing, and if the City does not give notice in writing to the Contractor to resume work at a date within 90 days of the date fixed in the written notice to suspend, then the Contractor may abandon that portion of the work suspended and will be entitled to the estimates and payments for all work done on the portions abandoned, if any, plus 10% of the value of the work abandoned, to compensate for loss of overhead, plant expense, and anticipated profit.

Section 21 - Delays and the City's Right to Terminate Contract

If the Contractor refuses or fails to prosecute the work, or any separate part of it, with the diligence required to insure completion, ready for operation, within the allowable number of consecutive calendar days specified plus extensions, or fails to complete the work within the required time, the City may, by written notice to the Contractor, terminate its right to proceed with the work or any part of the work as to which there has been delay. After providing the notice the City may take over the work and prosecute it to completion, by contract or otherwise, and the Contractor and its sureties shall be liable to the City for any excess cost to the City. If the Contractor's right to proceed is terminated, the City may take possession of and utilize in completing the work, any materials, appliances and plant as may be on the site of the work and useful for completing the work. The right of the Contractor to proceed shall not be terminated or the Contractor charged with liquidated damages where an extension of time is granted under Extension of Time - Section 14.

If the Contractor is adjudged a bankrupt, or if it makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of its insolvency, or if it persistently or repeatedly refuses or fails except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it fails to make prompt payments to subcontractors or for material or labor, or persistently disregards laws, ordinances or the instructions of the Supervising Professional, or otherwise is guilty of a substantial violation of any provision of the Contract, then the City, upon the certificate of the Supervising Professional that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor 3 days written notice, terminate this Contract. The City may then take possession of the premises and of all materials, tools and appliances thereon and without prejudice to any other remedy it may have, make good the deficiencies or finish the work by whatever method it may deem expedient, and deduct the cost from the payment due the Contractor. The Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of finishing the work, including compensation for additional managerial and administrative services exceeds the unpaid balance of the Contract Sum, the Contractor and its surety are liable to the City for any excess cost incurred. The expense incurred by the City, and the damage incurred through the Contractor's default, shall be certified by the Supervising Professional.

Section 22 - Contractor's Right to Terminate Contract

If the work should be stopped under an order of any court, or other public authority, for a period of 3 months, through no act or fault of the Contractor or of anyone employed by it, then the Contractor may, upon 7 days written notice to the City, terminate this Contract and recover from the City payment for all acceptable work executed plus reasonable profit.

Section 23 - City's Right To Do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the City, 3 days after giving written notice to the Contractor and its surety may, without prejudice to any other remedy the City may have, make good the deficiencies and may deduct the cost from the payment due to the Contractor.

Section 24 - Removal of Equipment and Supplies

In case of termination of this Contract before completion, from any or no cause, the Contractor, if notified to do so by the City, shall promptly remove any part or all of its equipment and supplies from the property of the City, failing which the City shall have the right to remove the equipment and supplies at the expense of the Contractor.

The removed equipment and supplies may be stored by the City and, if all costs of removal and storage are not paid by the Contractor within 10 days of invoicing, the City upon 10 days written notice may sell the equipment and supplies at auction or private sale, and shall pay the Contractor the net proceeds after deducting all costs and expenses that should have been borne by the Contractor and after deducting all amounts claimed due by any lien holder of the equipment or supplies.

Section 25 - Responsibility for Work and Warranties

The Contractor assumes full responsibility for any and all materials and equipment used in the construction of the work and may not make claims against the City for damages to materials and equipment from any cause except negligence or willful act of the City. Until its final acceptance, the Contractor shall be responsible for damage to or destruction of the project (except for any part covered by Partial Completion and Acceptance - Section 26). The Contractor shall make good all work damaged or destroyed before acceptance. All risk of loss remains with the Contractor until final acceptance of the work (Section 19) or partial acceptance (Section 26). The Contractor is advised to investigate obtaining its own builders risk insurance.

The Contractor shall guarantee the quality of the work for a period of one year. The Contractor shall also unconditionally guarantee the quality of all equipment and materials that are furnished and installed under the contract for a period of one year. At the end of one year after the Contractor's receipt of final payment, the complete work, including equipment and materials furnished and installed under the contract, shall be inspected by the Contractor and the Supervising Professional. Any defects shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. Any defects that are identified prior to the end of one year shall also be inspected by the Contractor and the Supervising Professional and shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. The Contractor shall assign all manufacturer or material supplier warranties to the City prior to final payment. The assignment shall not relieve the Contractor of its obligations under this paragraph to correct defects.

Section 26 - Partial Completion and Acceptance

If at any time prior to the issuance of the final certificate referred to in Acceptance and Final Payment - Section 19, any portion of the permanent construction has been satisfactorily completed, and if the Supervising Professional determines that portion of the permanent construction is not required for the operations of the Contractor but is needed by the City, the Supervising Professional shall issue to the Contractor a certificate of partial completion, and immediately the City may take over and use the portion of the permanent construction described in the certificate, and exclude the Contractor from that portion.

The issuance of a certificate of partial completion shall not constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates if the Contractor has failed to complete it in accordance with the terms of this Contract. The issuance of the certificate shall not release the Contractor or its sureties from any obligations under this Contract including bonds.

If prior use increases the cost of, or delays the work, the Contractor shall be entitled to extra compensation, or extension of time, or both, as the Supervising Professional may determine.

Section 27 - Payments Withheld Prior to Final Acceptance of Work

The City may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any certificate to the extent reasonably appropriate to protect the City from loss on account of:

(1) Defective work not remedied;

(2) Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor;

(3) Failure of the Contractor to make payments properly to subcontractors or for material or labor;

(4) Damage to another Contractor.

When the above grounds are removed or the Contractor provides a Surety Bond satisfactory to the City which will protect the City in the amount withheld, payment shall be made for amounts withheld under this section.

Section 28 - Contractor's Insurance

(1) The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself and the City from all claims for bodily injuries, death or property damage that may arise under this Contract; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor, any subcontractor, or anyone employed by them directly or indirectly. Prior to commencement of any work under this contract, Contractor shall provide to the City documentation satisfactory to the City, through City-approved means (currently myCOI), demonstrating it has obtained the required policies and endorsements. The certificates of insurance endorsements and/or copies of policy language shall document that the Contractor satisfies the following minimum requirements. Contractor shall add registration@mycoitracking.com to its safe sender's list so that it will receive necessary communication from myCOI. When requested, Contractor shall provide the same documentation for its subcontractor(s) (if any).

Required insurance policies include:

(a) Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

Bodily Injury by Accident - $500,000 each accident
Bodily Injury by Disease - $500,000 each employee
Bodily Injury by Disease - $500,000 each policy limit

(b) Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 04 13 or current equivalent. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements specifically for the following coverages: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further there shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. The following minimum limits of liability are required:

$1,000,000	Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined.
$2,000,000	Per Project General Aggregate
$1,000,000	Personal and Advertising Injury
$2,000,000	Products and Completed Operations Aggregate, which,

notwithstanding anything to the contrary herein, shall be maintained for three years from the date the services are completed.

(c) Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 10 13 or current equivalent. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. Further, the limits of liability shall be $1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

(d) Umbrella/Excess Liability Insurance shall be provided to apply excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of $1,000,000.

(e) Professional Liability Insurance or Errors and Omissions Insurance protecting the Contractor and its employees in an amount not less than $1,000,000.

(2) Insurance required under subsection (1)(b) and (1)(c) above shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City for any insurance listed herein.

(3) Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and demonstrate an unconditional and un-qualified 30-day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number(s); name of insurance company(s); name and address of the agent(s) or authorized representative(s); name(s), email address(es), and address of

insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which may be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) and all required endorsements to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.

(4) Any Insurance provider of Contractor shall be authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-authorized insurance companies are not acceptable unless approved in writing by the City.

(5) City reserves the right to require additional coverage and/or coverage amounts as may be included from time to time in the Detailed Specifications for the Project.

(6) The provisions of General Condition 28 shall survive the expiration or earlier termination of this contract for any reason.

Section 29 - Surety Bonds

Bonds will be required from the successful bidder as follows:

(1) A Performance Bond to the City of Ann Arbor for the amount of the bid(s) accepted;
(2) A Labor and Material Bond to the City of Ann Arbor for the amount of the bid(s) accepted.

Bonds shall be executed on forms supplied by the City in a manner and by a Surety Company authorized to transact business in Michigan and satisfactory to the City Attorney.

Section 30 - Damage Claims

The Contractor shall be held responsible for all damages to property of the City or others, caused by or resulting from the negligence of the Contractor, its employees, or agents during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. The Contractor must restore all property injured including sidewalks, curbing, sodding, pipes, conduit, sewers or other public or private property to not less than its original condition with new work.

Section 31 - Refusal to Obey Instructions

If the Contractor refuses to obey the instructions of the Supervising Professional, the Supervising Professional shall withdraw inspection from the work, and no payments will be made for work performed thereafter nor may work be performed thereafter until the Supervising Professional shall have again authorized the work to proceed.

Section 32 - Assignment

Neither party to the Contract shall assign the Contract without the written consent of the other. The Contractor may assign any monies due to it to a third party acceptable to the City.

Section 33 - Rights of Various Interests

Whenever work being done by the City's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Supervising Professional, to secure the completion of the various portions of the work in general harmony.

The Contractor is responsible to coordinate all aspects of the work, including coordination of, and with, utility companies and other contractors whose work impacts this project.

Section 34 - Subcontracts

The Contractor shall not award any work to any subcontractor without prior written approval of the City. The approval will not be given until the Contractor submits to the City a written statement concerning the proposed award to the subcontractor. The statement shall contain all information the City may require.

The Contractor shall be as fully responsible to the City for the acts and omissions of its subcontractors, and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and all other contract documents applicable to the work of the subcontractors and to give the Contractor the same power to terminate any subcontract that the City may exercise over the Contractor under any provision of the contract documents.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the City.

Section 35 - Supervising Professional's Status

The Supervising Professional has the right to inspect any or all work. The Supervising Professional has authority to stop the work whenever stoppage may be appropriate to insure the proper execution of the Contract. The Supervising Professional has the authority to reject all work and materials which do not conform to the Contract and to decide questions which arise in the execution of the work.

The Supervising Professional shall make all measurements and determinations of quantities. Those measurements and determinations are final and conclusive between the parties.

Section 36 - Supervising Professional's Decisions

The Supervising Professional shall, within a reasonable time after their presentation to the Supervising Professional, make decisions in writing on all claims of the City or the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the contract documents.

Section 37 - Storing Materials and Supplies

Materials and supplies may be stored at the site of the work at locations agreeable to the City unless specific exception is listed elsewhere in these documents. Ample way for foot traffic and drainage must be provided, and gutters must, at all times, be kept free from obstruction. Traffic on streets shall be interfered with as little as possible. The Contractor may not enter or occupy

with agents, employees, tools, or material any private property without first obtaining written permission from its owner. A copy of the permission shall be furnished to the Supervising Professional.

Section 38 - Lands for Work

The Contractor shall provide, at its own expense and without liability to the City, any additional land and access that may be required for temporary construction facilities or for storage of materials.

Section 39 - Cleaning Up

The Contractor shall, as directed by the Supervising Professional, remove at its own expense from the City's property and from all public and private property all temporary structures, rubbish and waste materials resulting from its operations unless otherwise specifically approved, in writing, by the Supervising Professional.

Section 40 - Salvage

The Supervising Professional may designate for salvage any materials from existing structures or underground services. Materials so designated remain City property and shall be transported or stored at a location as the Supervising Professional may direct.

Section 41 - Night, Saturday or Sunday Work

No night or Sunday work (without prior written City approval) will be permitted except in the case of an emergency and then only to the extent absolutely necessary. The City may allow night work which, in the opinion of the Supervising Professional, can be satisfactorily performed at night. Night work is any work between 8:00 p.m. and 7:00 a.m. No Saturday work will be permitted unless the Contractor gives the Supervising Professional at least 48 hours but not more than 5 days notice of the Contractor's intention to work the upcoming Saturday.

Section 42 - Sales Taxes

Under State law the City is exempt from the assessment of State Sales Tax on its direct purchases. Contractors who acquire materials, equipment, supplies, etc. for incorporation in City projects are not likewise exempt. State Law shall prevail. The Bidder shall familiarize itself with the State Law and prepare its Bid accordingly. No extra payment will be allowed under this Contract for failure of the Contractor to make proper allowance in this bid for taxes it must pay.

EXHIBIT E

CONTRACTOR'S DECLARATION

I hereby declare that I have not, during the period _____, 20__, to _____, 20 , performed any work, furnished any materials, sustained any loss, damage or delay, or otherwise done anything in addition to the regular items (or executed change orders) set forth in the Contract titled _____, for which I shall ask, demand, sue for, or claim compensation or extension of time from the City, except as I hereby make claim for additional compensation or extension of time as set forth on the attached itemized statement. I further declare that I have paid all payroll obligations related to this Contract that have become due during the above period and that all invoices related to this Contract received more than 30 days prior to this declaration have been paid in full except as listed below.

There is/is not (Contractor please circle one and strike one as appropriate) an itemized statement attached regarding a request for additional compensation or extension of time.

_____ _____

Contractor Date

By _____
(Signature)

Its _____
(Title of Office)

Past due invoices, if any, are listed below

CONTRACTOR'S AFFIDAVIT

The undersigned Contractor,_____, represents that on _____, 20___, it was awarded a contract by the City of Ann Arbor, Michigan to_____ under the terms and conditions of a Contract titled _____. The Contractor represents that all work has now been accomplished and the Contract is complete.

The Contractor warrants and certifies that all of its indebtedness arising by reason of the Contract has been fully paid or satisfactorily secured; and that all claims from subcontractors and others for labor and material used in accomplishing the project, as well as all other claims arising from the performance of the Contract, have been fully paid or satisfactorily settled. The Contractor agrees that, if any claim should hereafter arise, it shall assume responsibility for it immediately upon request to do so by the City of Ann Arbor.

The Contractor, for valuable consideration received, does further waive, release and relinquish any and all claims or right of lien which the Contractor now has or may acquire upon the subject premises for labor and material used in the project owned by the City of Ann Arbor.

This affidavit is freely and voluntarily given with full knowledge of the facts.

_____ _____
Contractor Date

By _____
(Signature)

Its _____
(Title of Office)

Subscribed and sworn to before me, on this _____ day of _____, 20__
_____ , _____ County, Michigan
Notary Public
_____ County, MI
My commission expires on: