


**CITY OF MARYSVILLE AGENDA BILL**

**EXECUTIVE SUMMARY FOR ACTION**

**CITY COUNCIL MEETING DATE: 4/14/2014**

<b>AGENDA ITEM:</b> Professional Services Agreement with BHC Consultants	
<b>PREPARED BY:</b> Jeff Cobb, Wastewater Treatment Plant Lead	<b>DIRECTOR APPROVAL:</b> 
<b>DEPARTMENT:</b> Public Works	
<b>ATTACHMENTS:</b> 2 Copies of a Professional Services Agreement and associated attachments	
<b>BUDGET CODE:</b> 40142480.541000	<b>AMOUNT:</b> \$135,539

**SUMMARY:**

A membrane feasibility study was completed for the City in December 2013. A couple of treatment alternatives were analyzed and conceptual construction and cost estimates were prepared. The study concluded with a recommendation to move forward with a membrane filtration pilot study.

The attached Professional Services Agreement with BHC Consultants would allow for project management and design services for a membrane filtration pilot test to meet Class A reclaimed water standards at the City's Wastewater Treatment Plant facility. Class A reclaimed water would offset demand for potable water, allowing deferral of future expansions to the potable water system as well as a potentially more economic source of supply to customers for non-potable use. The benefits may also allow year round discharge to the Steamboat Slough outfall. This pilot study would start May 2014 and last for about 120 days to allow sufficient data collection.

**RECOMMENDED ACTION:**

Staff recommends that Council authorize the Mayor to sign the Professional Services Agreement between the City of Marysville and BHC Consultants in the amount of \$135,539.

**PROFESSIONAL SERVICES AGREEMENT BETWEEN  
CITY OF MARYSVILLE  
AND BHC CONSULTANTS  
FOR CONSULTANT SERVICES**

THIS AGREEMENT ("Agreement") is made and entered into by and between the City of **Marysville**, a Washington State municipal corporation ("City"), and **BHC Consultants**, a Washington LLC ("Consultant").

NOW, THEREFORE, in consideration of the terms, conditions, covenants and performances contained herein, the parties hereto agree as follows:

**ARTICLE I. PURPOSE**

The purpose of this Agreement is to provide the City with consultant services regarding **The Membrane Filtration Pilot Study at the City's Wastewater Treatment Facility** as described in Article II. The general terms and conditions of the relationship between the City and the Consultant are specified in this Agreement.

**ARTICLE II. SCOPE OF SERVICES**

The Scope of Services is attached hereto as **Exhibit "A"** and incorporated herein by this reference ("Scope of Services"). All services and materials necessary to accomplish the tasks outlined in the Scope of Services shall be provided by the Consultant unless noted otherwise in the Scope of Services or this Agreement. All such services shall be provided in accordance with the standards of the Consultant's profession.

**ARTICLE III. OBLIGATIONS OF THE CONSULTANT**

III.1 **MINOR CHANGES IN SCOPE.** The Consultant shall accept minor changes, amendments, or revision in the detail of the Scope of Services as may be required by the City when such changes will not have any impact on the service costs or proposed delivery schedule. Extra work, if any, involving substantial changes and/or changes in cost or schedules will be addressed as follows:

**Extra Work.** The City may desire to have the Consultant perform work or render services in connection with each project in addition to or other than work provided for by the expressed intent of the Scope of Services in the scope of services. Such work will be considered as extra work and will be specified in a written supplement to the scope of services, to be signed by both parties, which will set forth the nature and the scope thereof. All proposals for extra work or services shall be prepared by the Consultant at no cost to the City. Work under a supplemental agreement shall not proceed until executed in writing by the parties.

**III.2 WORK PRODUCT AND DOCUMENTS.** The work product and all documents produced under this Agreement shall be furnished by the Consultant to the City, and upon completion of the work shall become the property of the City, except that the Consultant may retain one copy of the work product and documents for its records. The Consultant will be responsible for the accuracy of the work, even though the work has been accepted by the City.

In the event that the Consultant shall default on this Agreement or in the event that this Agreement shall be terminated prior to its completion as herein provided, all work product of the Consultant, along with a summary of work as of the date of default or termination, shall become the property of the City. Upon request, the Consultant shall tender the work product and summary to the City. Tender of said work product shall be a prerequisite to final payment under this Agreement. The summary of work done shall be prepared at no additional cost to the City.

Consultant will not be held liable for reuse of documents produced under this Agreement or modifications thereof for any purpose other than those authorized under this Agreement without the written authorization of Consultant.

**III.3 TERM.** The term of this Agreement shall commence upon issuance of Notice of Proceed and shall terminate at midnight, **January 31, 2015**. The parties may extend the term of this Agreement by written mutual agreement.

**III.4 NONASSIGNABLE.** The services to be provided by the Consultant shall not be assigned or subcontracted without the express written consent of the City.

**III.5 EMPLOYMENT.** Any and all employees of the Consultant, while engaged in the performance of any work or services required by the Consultant under this Agreement, shall be considered employees of the Consultant only and not of the City, and any and all claims that may or might arise under the Workman's Compensation Act on behalf of any said employees while so engaged, and any and all claims made by any third party as a consequence of any negligent act or omission on the part of the Consultant or its employees while so engaged in any of the work or services provided herein shall be the sole obligation of the Consultant.

**III.6 INDEMNITY.** Indemnification/Hold Harmless Consultant shall defend, indemnify and hold the City, its officers, officials, employees and volunteers harmless from any and all claims, injuries, damages, losses or suits including attorney fees, arising out of or resulting from the acts, errors or omissions of the Consultant in performance of this Agreement, except for injuries and damages caused by the sole negligence of the City. Should a court of competent jurisdiction determine that this Agreement is subject to RCW 4.24.115, then, in the event of liability for damages arising out of bodily injury to persons or damages to property caused by or resulting from the concurrent negligence of the Consultant and the City, its officers, officials, employees, and volunteers, the Consultant's liability, including the duty and cost to defend, hereunder shall be only to the extent of the Consultant's negligence. It is further specifically and expressly understood that the indemnification provided herein constitutes the Consultant's waiver of immunity under Industrial Insurance, Title 51 RCW, solely for the

purposes of this indemnification. This waiver has been mutually negotiated by the parties. The provisions of this section shall survive the expiration or termination of this Agreement.

### III.7 INSURANCE.

a. **Minimum Limits of Insurance.** The Consultant shall procure, and maintain for the duration of the Agreement, insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work and services hereunder by the Consultant, its agents, representatives, employees or subcontractors. The Consultant shall, before commencing work under this agreement, file with the City certificates of insurance coverage and the policy endorsement to be kept in force continuously during this Agreement, in a form acceptable to the City. Said certificates and policy endorsement shall name the City, its officers, elected officials, agents and/or employees as an additional named insured with respect to all coverages except professional liability insurance and workers' compensation. The minimum insurance requirements shall be as follows:

(1) Comprehensive General Liability. \$1,000,000 combined single limit per occurrence for bodily injury personal injury and property damage; \$2,000,000 general aggregate.

(2) Automobile Liability. \$300,000 combined single limit per accident for bodily injury and property damage.

(3) Workers' Compensation. Workers' compensation limits as required by the Workers' Compensation Act of Washington.

(4) Consultant's Errors and Omissions Liability. \$1,000,000 per occurrence and as an annual aggregate.

b. **Notice of Cancellation.** In the event that the Consultant receives notice (written, electronic or otherwise) that any of the above required insurance coverage is being cancelled and/or terminated, the Consultant shall immediately (within forty-eight (48) hours) provide written notification of such cancellation/termination to the City.

c. **Acceptability of Insurers.** Insurance to be provided by Consultant shall be with a Bests rating of no less than A:VII, or if not rated by Bests, with minimum surpluses the equivalent of Bests' VII rating.

d. **Verification of Coverage.** In signing this agreement, the Consultant is acknowledging and representing that required insurance is active and current. Further, throughout the term of this Agreement, the Consultant shall provide the City with proof of insurance upon request by the City.

e. **Insurance shall be Primary.** The Consultant's insurance coverage shall

be primary insurance as respect the City. Any insurance, self-insurance, or insurance pool coverage maintained by the City shall be excess of the Consultant's insurance and shall not contribute with it.

f. **No Limitation.** Consultant's maintenance of insurance as required by this Agreement shall not be construed to limit the liability of the Consultant to the coverage provided by such insurance or otherwise limit the recourse to any remedy available at law or in equity.

g. **Claims-made Basis.** Unless approved by the City all insurance policies shall be written on an "Occurrence" policy as opposed to a "Claims-made" policy. The City may require an extended reporting endorsement on any approved "Claims-made" policy.

**III.8 DISCRIMINATION PROHIBITED AND COMPLIANCE WITH EQUAL OPPORTUNITY LEGISLATION.** The Consultant agrees to comply with equal opportunity employment and not to discriminate against client, employee, or applicant for employment or for services because of race, creed, color, religion, national origin, marital status, sex, sexual orientation, age or handicap except for a bona fide occupational qualification with regard, but not limited to, the following: employment upgrading; demotion or transfer; recruitment or any recruitment advertising; layoff or terminations; rates of pay or other forms of compensation; selection for training, rendition of services. The Consultant further agrees to maintain (as appropriate) notices, posted in conspicuous places, setting forth the provisions of this nondiscrimination clause. The Consultant understands and agrees that if it violates this nondiscrimination provision, this Agreement may be terminated by the City, and further that the Consultant will be barred from performing any services for the City now or in the future, unless a showing is made satisfactory to the City that discriminatory practices have been terminated and that recurrence of such action is unlikely.

**III.9 UNFAIR EMPLOYMENT PRACTICES.** During the performance of this Agreement, the Consultant agrees to comply with RCW 49.60.180, prohibiting unfair employment practices.

**III.10 LEGAL RELATIONS.** The Consultant shall comply with all federal, state and local laws and ordinances applicable to work to be done under this Agreement. The Consultant represents that the firm and all employees assigned to work on any City project are in full compliance with the statutes of the State of Washington governing activities to be performed and that all personnel to be assigned to the work required under this Agreement are fully qualified and properly licensed to perform the work to which they will be assigned. This Agreement shall be interpreted and construed in accordance with the laws of Washington. Venue for any litigation commenced relating to this Agreement shall be in Snohomish County Superior Court.

**III.11 INDEPENDENT CONTRACTOR.**

a. The Consultant and the City understand and expressly agree that the Consultant is an independent contractor in the performance of each and every part of this Agreement. The Consultant expressly represents, warrants and agrees that his status as an independent contractor in the performance of the work and services required under this Agreement is consistent with and meets the six-part independent contractor test set forth in RCW 51.08.195 or as hereafter amended. The Consultant, as an independent contractor, assumes the entire responsibility for carrying out and accomplishing the services required under this Agreement. The Consultant shall make no claim of City employment nor shall claim any related employment benefits, social security, and/or retirement benefits.

b. The Consultant shall be solely responsible for paying all taxes, deductions, and assessments, including but not limited to federal income tax, FICA, social security tax, assessments for unemployment and industrial injury, and other deductions from income which may be required by law or assessed against either party as a result of this Agreement. In the event the City is assessed a tax or assessment as a result of this Agreement, the Consultant shall pay the same before it becomes due.

c. The City may, during the term of this Agreement, engage other independent contractors to perform the same or similar work that the Consultant performs hereunder.

d. Prior to commencement of work, the Consultant shall obtain a business license from the City.

**III.12 CONFLICTS OF INTEREST.** The Consultant agrees to and shall notify the City of any potential conflicts of interest in Consultant's client base and shall obtain written permission from the City prior to providing services to third parties where a conflict or potential conflict of interest is apparent. If the City determines in its sole discretion that a conflict is irreconcilable, the City reserves the right to terminate this Agreement.

**III.13 CITY CONFIDENCES.** The Consultant agrees to and will keep in strict confidence, and will not disclose, communicate or advertise to third parties without specific prior written consent from the City in each instance, the confidences of the City or any information regarding the City or services provided to the City.

**III.14 SUBCONTRACTORS/SUBCONSULTANTS.**

a. The Consultant shall is responsible for all work performed by subcontractors/subconsultants pursuant to the terms of this Agreement.

b. The Consultant must verify that any subcontractors/subconsultants they directly hire meet the responsibility criteria for the project. Verification that a subcontractor/subconsultant has proper license and bonding, if required by statute, must be included in the verification process. The Consultant will use the following Subcontractors/Subconsultants or as set forth in **Exhibit A**:

**ZENON Environmental Corporation c/o  
GE Water & Process Technologies  
3239 Dundas Street West  
Oakville, ON L6M 4B2**

c. The Consultant may not substitute or add subcontractors/subconsultants without the written approval of the City.

d. All Subcontractors/Subconsultants shall have the same insurance coverages and limits as set forth in this Agreement and the Consultant shall provide verification of said insurance coverage.

#### **ARTICLE IV. OBLIGATIONS OF THE CITY**

##### **IV.1 PAYMENTS.**

a. The Consultant shall be paid by the City for services rendered under this Agreement as described in the Scope of Services and as provided in this section. In no event shall the compensation paid to Consultant under this Agreement exceed **\$135,539** without the written agreement of the Consultant and the City. Such payment shall be full compensation for work performed and services rendered and for all labor, materials, supplies, equipment and incidentals necessary to complete the work. In the event the City elects to expand the scope of services from that set forth in Exhibit A, the City shall pay Consultant a mutually agreed amount.

b. The Consultant shall submit a monthly invoice to the City for services performed in the previous calendar month in a format acceptable to the Cities. The Consultant shall maintain time and expense records and provide them to the Cities upon request.

c. The City will pay timely submitted and approved invoices received before the 20th of each month within thirty (30) days of receipt.

**IV.2 CITY APPROVAL.** Notwithstanding the Consultant's status as an independent contractor, results of the work performed pursuant to this Agreement must meet the approval of the City, which shall not be unreasonably withheld if work has been completed in compliance with the Scope of Services and City requirements.

**IV.3 MAINTENANCE/INSPECTION OF RECORDS.** The Consultant shall maintain all books, records, documents and other evidence pertaining to the costs and expenses

allowable under this Agreement in accordance with generally accepted accounting practices. All such books and records required to be maintained by this Agreement shall be subject to inspection and audit by representatives of the City and/or the Washington State Auditor at all reasonable times, and the Consultant shall afford the proper facilities for such inspection and audit. Representatives of the City and/or the Washington State Auditor may copy such books, accounts and records where necessary to conduct or document an audit. The Consultant shall preserve and make available all such books of account and records for a period of three (3) years after final payment under this Agreement. In the event that any audit or inspection identifies any discrepancy in such financial records, the Consultant shall provide the City with appropriate clarification and/or financial adjustments within thirty (30) calendar days of notification of the discrepancy.

## **ARTICLE V. GENERAL**

V.1 **NOTICES.** Notices to the City shall be sent to the following address:

**City of Marysville, Public Works Dept.  
80 Columbia Avenue  
Marysville, WA 98270  
Attn: Jeff Cobb**

Notices to the Consultant shall be sent to the following address:

**BHC Consultants  
950 Pacific Avenue, Ste 710  
Tacoma, WA 98402  
Attn: Mr. Tom Giese**

Receipt of any notice shall be deemed effective three (3) days after deposit of written notice in the U.S. mail with proper postage and address.

V.2 **TERMINATION.** The right is reserved by the City to terminate this Agreement in whole or in part at any time upon ten (10) calendar days' written notice to the Consultant.

If this Agreement is terminated in its entirety by the City for its convenience, the City shall pay the Consultant for satisfactory services performed through the date of termination in accordance with payment provisions of Section VI.1.

V.3 **DISPUTES.** The parties agree that, following reasonable attempts at negotiation and compromise, any unresolved dispute arising under this Agreement may be resolved by a mutually agreed-upon alternative dispute resolution of arbitration or mediation.

V.4 **EXTENT OF AGREEMENT/MODIFICATION.** This Agreement, together with attachments or addenda, represents the entire and integrated Agreement between the parties and supersedes all prior negotiations, representations, or agreements, either written or oral. This



Agreement may be amended, modified or added to only by written instrument properly signed by both parties.

**V.5 SEVERABILITY**

a. If a court of competent jurisdiction holds any part, term or provision of this Agreement to be illegal or invalid, in whole or in part, the validity of the remaining provisions shall not be affected, and the parties' rights and obligations shall be construed and enforced as if the Agreement did not contain the particular provision held to be invalid.

b. If any provision of this Agreement is in direct conflict with any statutory provision of the State of Washington, that provision which may conflict shall be deemed inoperative and null and void insofar as it may conflict, and shall be deemed modified to conform to such statutory provision.

**V.6 NONWAIVER.** A waiver by either party hereto of a breach by the other party hereto of any covenant or condition of this Agreement shall not impair the right of the party not in default to avail itself of any subsequent breach thereof. Leniency, delay or failure of either party to insist upon strict performance of any agreement, covenant or condition of this Agreement, or to exercise any right herein given in any one or more instances, shall not be construed as a waiver or relinquishment of any such agreement, covenant, condition or right.

**V.7 FAIR MEANING.** The terms of this Agreement shall be given their fair meaning and shall not be construed in favor of or against either party hereto because of authorship. This Agreement shall be deemed to have been drafted by both of the parties.

**V.8 GOVERNING LAW.** This Agreement shall be governed by and construed in accordance with the laws of the State of Washington.

**V.9 VENUE.** The venue for any action to enforce or interpret this Agreement shall lie in the Superior Court of Washington for Snohomish County, Washington.

**V.10 COUNTERPARTS.** This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same Agreement.

**V.11 AUTHORITY TO BIND PARTIES AND ENTER INTO AGREEMENT.** The undersigned represent that they have full authority to enter into this Agreement and to bind the parties for and on behalf of the legal entities set forth below.

DATED this \_\_\_\_\_ day of \_\_\_\_\_, 2014.

CITY OF MARYSVILLE

**BHC Consultants LLC**  
**1601 5<sup>th</sup> Avenue, Suite 500**  
**Seattle, WA 98101**

By \_\_\_\_\_  
\_\_\_\_\_, Mayor

By   
President

Approved as to form:

\_\_\_\_\_  
City Attorney

## **Exhibit A Scope of Work**

### **City of Marysville Membrane Treatment Pilot Testing**

#### **Statement of Understanding**

This Scope of Work shall include the work program associated with pilot testing a hollow-fiber membrane bioreactor (MBR) technology to produce Class A reclaimed water and remove most of the nitrogen from effluent at the City of Marysville's (City's) wastewater treatment plant (WWTP). The pilot program is based on recommendations from the December 2013 Class A Reclaimed Water Feasibility Study (Feasibility Study). The MBR pilot system will consist of a membrane tank, aerobic tank for nitrification, anoxic tank for denitrification and all appurtenances necessary for lagoon effluent feed pumping, permeate pumping, aeration, air scour, mixing, and membrane cleaning. At the conclusion of pilot testing, a report will be prepared summarizing the MBR pilot system, analysis of results and conclusions.

The purpose of conducting the pilot testing is to demonstrate the performance of the membrane system in producing Class A reclaimed water (under all anticipated operating conditions, including during algal blooms in the lagoons) and removing most of the nitrogen, demonstrate the applicability of membrane treatment, and also provide information on the performance and operation of the membrane system for use during design development. Because the pilot testing is being conducted at the request of the City and for the City's consideration only at this point, pilot testing documentation will not be submitted for review or approval by Washington State Department of Ecology. However, consideration will be given to an appropriate level of coordination with Ecology to streamline review of design documents in the future, should this project move forward into a design phase.

#### **City Responsibilities**

The following items are specific responsibilities of the City in support of this Scope of Work:

- Provide comments on the draft Pilot Testing Plan and draft Pilot Testing Summary Report.
- Provide space for setup of the MBR pilot system.
- Receive and unload the MBR pilot system from the freight truck.
- Provide power, telephone and water utilities to run the MBR pilot system.
- Provide effluent and temporary plumbing for supplying flow to the pilot system and a location and temporary plumbing to dispose of permeate and reject streams to the current liquid stream process. The City shall provide two effluent sources, one before and one after the existing sand filters, only one of which will be utilized at any time.
- Connect/route utilities, effluent feed and permeate/reject disposal plumbing prior to GE showing up on site for commissioning.
- If deemed practical, provide a source of influent wastewater and temporary plumbing for supplemental carbon feed. Alternately, provide chemical for supplemental carbon, if needed and use of influent wastewater is not practical.
- Following piloting startup and manufacturer training, lead operation of the MBR pilot system and make operational adjustments under guidance from BHC and the MBR system supplier.
- Provide necessary composite samplers for sample collection.
- Collect and test samples for MBR pilot testing.
- Cost and labor associated with collection, delivery, and testing of samples at an accredited laboratory.
- Decommission and load the MBR pilot system onto the freight truck, with assistance from GE.
- Cost of repairs or damage to the MBR pilot system resulting from improper handling or operation.

## Schedule

BHC will undertake to complete the Scope of Work based on the milestones listed below, assuming notice-to-proceed (NTP) is provided on or before April 16, 2014. The duration of the pilot testing will be 4 months from the date the MBR pilot system arrives on site to the date that it is removed from the site.

- Submit draft testing plan for review – 05/07/14 (21 days following NTP)
- Finalize testing plan – 05/21/14 (14 days following draft plan submittal)
- MBR pilot system on site – 05/26/2014 (up to 40 days following NTP)
- MBR pilot system startup – 06/09/14 (14 days following arrival of the pilot system)
- MBR pilot testing concluded – 09/19/14 (103 days following startup)
- MBR pilot system disassembled and ready for retrieval – 09/26/14 (7 days following completion of testing)
- Submit draft Pilot Testing Summary Report – 10/24/14 (28 days following conclusion of pilot testing)
- Submit final Pilot Testing Summary Report – 11/15/14 (21 days following draft report submittal, assuming up to a 2 week review period by the City)

BHC shall perform these services with reasonable diligence and expediency consistent with the standard of care for professional engineering services. If necessary, this schedule shall be equitably adjusted to allow for changes in scope or for delays beyond BHC's reasonable control.

## Exclusions

The following items are excluded from this work scope, but can be included in a future scope of work:

- Pilot testing membrane equipment other than an MBR pilot system by General Electric (GE).
- Running a pilot test for a duration exceeding 4 months.
- Refining the conceptual design and conceptual cost estimates based on pilot testing results to develop a preliminary design and updated opinion of probable cost.
- Preparation of an Engineering Report meeting the requirements of WAC 173-240-060.
- Outfall analysis, including a mixing zone study for Steamboat Slough.
- Preparation of a SEPA checklist or SERP documents, which may include a biological assessment and cultural resources survey. SERP documents would be required if federal funding through the state revolving fund is desired.
- Final design and construction services.

## Budget

The budget for this scope of work is \$135,539. BHC will be compensated by the City on a time and materials basis. Compensation shall not exceed the budgeted amount without prior authorization from the City.

### Task 1- Project Coordination and Management

Receivables:

- Invoicing requirements, as applicable, from the City

Work Tasks:

- 1.1 Project setup, invoicing and communication with City staff.
- 1.2 Manage the project and coordinate the project team.
- 1.3 QA/QC review of the draft Pilot Testing Plan and draft Pilot Testing Summary Report.

Deliverables:

- Invoices

### Task 2 – Pilot Testing

Receivables:

- Pilot system sample testing results from the City

- City comments on draft Pilot Testing Plan

Work Tasks:

- 2.1 Coordination with MBR Pilot System Supplier.
- 1) BHC will coordinate the MBR pilot system components and requirements with the MBR Pilot System Supplier (GE), who is subcontracted to BHC. The MBR pilot system will use hollow-fiber membranes submerged in a membrane tank. The membranes will filter suspended solids from the effluent to produce final effluent with turbidities meeting the requirements for Class A reclaimed water. The MBR pilot system will also include aerobic and anoxic tanks, upstream of the membrane tank, to nitrify and denitrify the effluent for removal of nitrogen. The MBR pilot system will come complete with all appurtenances necessary for lagoon effluent feed pumping, permeate pumping, aeration of the tanks, membrane air scouring, anoxic tank mixing, and membrane cleaning. The City will provide space for installing the pilot system, a source of effluent and temporary plumbing for supplying flow to the pilot system, a location and temporary plumbing to dispose of permeate and reject streams, and necessary electric, telephone and water utilities. A portion of the existing WWTP effluent will be diverted to the MBR pilot system downstream of the existing sand filters. A second feed point will also be provided upstream of the existing filters to test the pilot system without prior filtration, in the event it is determined that the small carryover of sand from the existing filters is a concern for the membranes. Effluent from the MBR pilot system will be returned to the current liquid stream process. A supplemental carbon feed and/or a feed of influent wastewater will be provided to introduce a carbon source for denitrification. The preferred source is influent wastewater, which would require the pilot system to be supplied with a screen filter for protection of the membranes. If a supplemental carbon feed is used, the City will provide the chemical and the pilot system will be equipped with a metering pump and tank to dose the supplemental carbon.
  - 2) BHC and GE will work with the City to develop a schedule for delivery and setup of the MBR pilot system and execution of the pilot testing.
  - 3) BHC and GE will work with the City to confirm the pilot testing objectives; identify requirements for sampling and testing to support those objectives; and appropriately allocate responsibilities for setup, operation, and decommissioning of the MBR pilot system.
- 2.2 BHC will develop a Pilot Testing Plan that will include the elements listed below. BHC will prepare a draft plan and incorporate comments from the City into final plan.
- 1) Overview of the MBR pilot system components and configuration including a site plan and schematic. The site plan will utilize the site background developed for the previously completed Feasibility Study.
  - 2) Identification and description of operating scenarios to be implemented during the pilot testing to examine impacts of various operational changes. These operational changes could include: feeding effluent from before and after the sand filters, modifying the coagulant dose for the sand filters, and changing the source of carbon for denitrification.
  - 3) Identification of the sampling locations, type of sample (i.e., grab or composite) and frequency of sample collection. Also identify operational parameters to be recorded and frequency of recording.
  - 4) Identification of parameters to be tested for each sample and the testing protocols to be used.
- 2.3 BHC and GE will be available to confer with the City throughout pilot testing. BHC and GE will provide guidance to the City on operation of the MBR pilot system, review of preliminary results, and subsequent adjustments to operations. BHC and GE will also provide oversight and guidance on implementation of the Pilot Testing Plan, including guidance on operational and pilot system modifications to follow the operational scenarios outlined in the plan.
- 2.4 BHC and GE will analyze test results and records of operational parameters to evaluate performance and efficiency of the MBR pilot system in meeting the objectives under the various operational scenarios that were tested. This analysis will also identify and evaluate trends, limitations and unique considerations associated with the operation of the MBR pilot system.

Deliverables:

- Draft Pilot Testing Plan
- Final Testing Plan

**Task 3 – Prepare Pilot Testing Summary Report**

Receivables:

- City comments on draft Pilot Testing Summary Report.

Work Tasks:

- 3.1 Summarize the MBR pilot system and objectives of pilot testing. Identify the main components and describe the purpose of each component. Include a schematic and site plan for the pilot system. The site plan will use the background developed for the previously completed Feasibility Study.
- 3.2 Summarize the Pilot Testing Plan. Describe the operational scenarios implemented during pilot testing and the sampling and testing program.
- 3.3 Summarize the analysis of results. Compare performance under the different operating scenarios with the pilot testing objectives and summarize trends, limitations and unique considerations.
- 3.4 Prepare the draft Pilot Testing Summary Report. Incorporate City comments on the draft report into the final Pilot Testing Summary Report.

Deliverables:

- Draft Pilot Testing Summary Report
- Final Pilot Testing Summary Report

**Task 4 – Meetings and Site Visits**

Receivables: None

Work Tasks:

- 4.1 Kickoff Meeting – Two representatives from BHC and one representative from GE will attend the kickoff meeting. The purpose of the kickoff meeting is to discuss project scope and schedule, project communications, information needs, and to establish responsibilities for the pilot testing. This will also be an opportunity to visit the WWTP site and look at locations for the pilot system, effluent feed, permeate/reject return, and utility connections.
- 4.2 Review Meetings – One representative from BHC will be at each of two review meetings. One review meeting will be to discuss City comments on the draft Pilot Testing Plan. The second review meeting will be to discuss City comments on the draft Pilot Testing Summary Report. GE will participate via teleconference as necessary.
- 4.3 Site Visits – One representative from BHC will conduct three (3) site visits during the 4-month pilot testing period. Additionally, GE will have a representative on site for 40 hours to work with the City to commission the MBR pilot system; and provide training to the City on operation of the pilot system. The City shall have connected/routed utilities, effluent feed and permeate/reject disposal plumbing prior to GE showing up on site for commissioning. GE will also be available for up to three (3) site visits during the 4-month pilot testing period.

Deliverables:

- Meeting agendas
- Meeting minutes