

## Exhibit A

### Reclaimed Water System Master Plan Scope of Services

#### Background and Objectives

The City of Durham (City) Department of Water Management desires to develop a reclaimed water master plan. Development of a reclaimed water utilization program has been identified as a key component in complying with increasingly stringent nutrient reduction requirements for wastewater discharges and in planning to meet the City's future potable water demands. The plan will consider a variety of cost and non-cost factors to identify the most favorable reclaimed water alternatives from a wide range of traditional and innovative strategies reflecting the current and potential future regulatory climate, as well as Durham's specific customer base. The intent of this plan is to start with a broader context of reclaimed water and evaluate how its various forms may be applied across Durham to reduce pressures on the City's water resources. The plan will then evaluate alternatives and provide specific recommendations for the implementation of this plan, as appropriate.

#### Scope of Work

##### *Task 1 – Kickoff Workshop, Data Collection and Meetings*

###### *Task 1.1 Data Collection and Review*

CDM Smith will obtain and review information from the City pertaining to existing water resources and demands, future land use plans, reclaimed water quality data from the North and South Durham Water Reclamation Facilities (WRFs), customer usage data for the potable water system (potable and irrigation), locations of the largest water users across the City, previous reclaimed water studies, and other potential opportunities for use of reclaimed water. A preliminary data request list is provided as an attachment to this scope of work.

###### *Task 1.2 – Kickoff Meeting*

After performing a cursory review of the data, CDM Smith will conduct a kickoff workshop with City staff and CDM Smith's key team members. The objectives of the workshop will be to:

- Discuss personnel introductions and roles and responsibilities;
- Review project goals, objectives, and critical success factors for the reclaimed water master plan, based on our understanding of the available data, and the other required information; and
- Review the scope of work.

At the kickoff meeting, CDM Smith will provide a preliminary list of objectives and alternative approaches based on our understanding of the City's needs and the state of the practice for reclaimed

water systems for review and comment by City staff. City staff may identify other approaches for consideration at the meeting.

### ***Task 1.3 – Project Meetings***

In addition to the project workshops identified in this scope of work, CDM Smith will meet with City staff as needed to keep City staff informed and gain feedback on significant issues. CDM Smith will provide meeting minutes to document the discussion and action items.

#### Task 1 Deliverables:

- Kickoff Meeting Minutes, including the list of approaches and alternatives to be evaluated.
- Meeting Minutes for follow up meetings, as needed.

### ***Task 2 – Identify Potential Reclaimed Water Use Opportunities***

#### ***Task 2.1 – Develop Demand Density Maps for Existing Customer Usage***

CDM Smith will develop preliminary water demand density maps that will be used to identify concentrations of potential reclaimed water customers that could provide economies of scale for the implementation of a reclaimed water distribution system. The demand density maps will be derived from:

- Water meter locations in the City's GIS;
- Existing water customer type and potable usage data;
- Assumptions on reclaimed water usage by customer type that are developed from current City customer profiles, reclaimed water profiles from customer types in surrounding communities, and typical reclaimed water profiles from accepted manuals of practice; and
- Other information that may be identified during Task 1.

The demand density maps will be used to identify clusters of potential reclaimed water customers and will also inform the approaches and alternatives recommended by CDM Smith for further evaluation.

#### ***Task 2.2 – Identify Potential Reclaimed Water Opportunities for Future Development***

CDM Smith will compare current and future land use plans from the City of Durham's Comprehensive Plan and other available planning documents to estimate where concentrations of reclaimed water demand may be located in the future. Typical reclaimed water demands will be assigned to the land use classifications included in the plans to approximate the total demand for use in screening alternative means of meeting these demands. CDM Smith will gather information by meeting with the City Planning Department and, if needed, staff from other City departments that may have knowledge of future development/redevelopment plans. If necessary, CDM Smith will develop assumptions about future development scenarios in the absence of existing information. In particular, future development near

potential anchor customers (to be identified in Task 2.3) will be considered when evaluating reclaimed water demand estimates over the planning horizon.

### ***Task 2.3 – Survey and Site Visits for Top Water Users***

Screening phone interviews will be conducted with up to 20 potential anchor customers within the concentrated demand nodes to gauge interest and determine whether any current potable water demands (such as cooling water makeup, irrigation, wash down, or others) could be met with non-potable reclaimed water. A list of anchor customer will be developed by CDM Smith in collaboration with the City. Based on initial screening interviews, follow-up in person interviews with up to ten potential customers will be conducted jointly with CDM Smith, City staff, and potential users to provide information on reclaimed water, gauge customer interest and concerns, and obtain further information about the potential magnitude and types of non-potable water demand. CDM Smith will also compile information about typical reclaimed water rate structures for municipalities in this area to share with potential customers during initial discussions.

CDM Smith will use the information evaluated in Task 2 to geographically identify potential non-potable reclaimed water demand, as well as the type of demand (e.g., irrigation, cooling or process water, etc.).

#### **Task 2 Deliverables:**

- CDM Smith will prepare a draft technical memorandum that summarizes the process used to identify demand densities, areas of concentrated future demand, and information obtained in surveys conducted with large potable water users. The technical memorandum will be submitted to the City for review prior to the Task 2 workshop.
- CDM Smith will conduct a workshop meeting with City staff to present and discuss the findings of Task 2, as summarized in the draft technical memorandum.
- The technical memorandum will be finalized based on the City's comments and will be incorporated into the final report.

### ***Task 3 – Estimate Reclaimed Water Demand and Usage Patterns***

CDM Smith will project an estimated rate of reclaimed water usage in 5-year increments over a 25-year planning horizon (2015 to 2035) to meet potential demands for the demand areas and potential customers identified in Task 2. Projected reclaimed water demands will be estimated through the following tasks:

#### ***Task 3.1 – Develop Average Demand***

CDM Smith will first quantify the average volume of water a site may be expected to use based upon records of past usage or planning information for potential new developments.

### ***Task 3.2 – Estimate Seasonal Demand Variations***

If available in sufficient detail, CDM Smith will use historic water use records to define the expected seasonal nature of reclaimed water demands at each type of site.

### ***Task 3.3 – Determine Peak Demand***

To develop accurate peak demand estimates to size the system, CDM Smith will review available hourly demand information from the City's automated meter reading program. CDM Smith will also use knowledge of reclaimed water demands and demand patterns observed from other surrounding community reclaimed water systems to estimate peaking factors.

### ***Task 3.4 – Evaluate Reliability of Reclaimed Water Supply***

CDM Smith will develop a water balance for reclaimed water availability at each WRF and projected seasonal demands that will be placed upon this non-potable water supply. This water balance evaluation will provide the needed information to size the potential pumping, disinfection, and diurnal storage facilities. It will also give an indication of how much reclaimed water the plant sources could ultimately supply.

### ***Task 3.5 – Customer Metering Allowance***

Where automated meter reading (AMR) is not available, specific customer metering may be recommended for estimating demand and planning and sizing system infrastructure. An allowance of \$27,000 is included in this scope for collection and analysis of meter monitoring data for up to 5 customer meters for up to 6 months, as necessary to develop peak factors. CDM Smith will install the meter monitors and will download data from the monitors on a weekly basis. One day is assumed for installation of the equipment. CDM Smith will pay for rental of the meter monitors. Work under this allowance must be authorized by the City prior to starting.

#### **Task 3 Deliverables:**

- CDM Smith will prepare a draft technical memorandum that summarizes the average demands, seasonal and diurnal variations, and peaking factors that are estimated for the reclaimed water demands identified under Task 3 and potential customers identified under Task 2. The technical memorandum will be submitted to the City for review prior to the Task 3 workshop.
- CDM Smith will conduct a workshop meeting with City staff to present and discuss the findings of Task 3, as summarized in the draft technical memorandum. This workshop will include identification of the metrics that will be used to qualitatively assess approaches and alternatives identified (See Task 4). CDM Smith will propose for the City's consideration any pertinent metrics identified in Tasks 1-3 that may not previously been identified by the City in the Request for Proposals for the Reclaimed Water Master Plan.

- The technical memorandum will be finalized based on the City’s comments and will be incorporated into the final report.

#### ***Task 4 – Evaluate Reclaimed Water Strategies***

##### ***Task 4.1 - Identify Reclaimed Water Alternatives for Consideration***

Using the preliminary estimates of demand identified in Tasks 2 and 3 and the alternatives assessment metrics identified in the Task 3 workshop, CDM Smith will identify reclaimed water approaches and conceptual alternatives that may be applicable to meet Durham’s objectives for implementing a reclaimed water system. The conceptual alternatives are intended to be big-picture and may include, for example, identification of a reclaimed water supply source and targeted potential distribution area or anchor customer(s).

##### ***Task 4.2 – Preliminary Assessment of Conceptual Alternatives***

CDM Smith will conduct a preliminary assessment of each of the identified conceptual alternatives on the basis of qualitative cost and non-cost factors (such as ability to meet City’s goals, relative capital and operating cost, regulatory and public acceptance, relative complexity, flexibility to meet future demands, environmental and water quality needs, compliance with City’s sustainability goals, and other metrics) using a “fatal flaw” type analysis.

##### ***Task 4.3 – Primary Alternatives Determination Workshop***

CDM Smith will conduct a workshop with City staff to present and discuss the findings of the preliminary, qualitative assessment conducted in Task 4.2, and determine which of the conceptual alternatives are feasible for further consideration. The outcome of this workshop will be the selection of up to 3 primary alternatives that will be evaluated in more detail. For these primary alternatives, facility improvements needed to implement the alternative including pumping, storage, treatment, and pipeline improvements will be established to develop preliminary costs for evaluation and comparison, as described in Tasks 4.4 and 4.5.

##### ***Task 4.4 – Hydraulic Modeling***

CDM Smith will perform hydraulic modeling to size reclaimed water transmission pipelines, storage, and pumping for up to 3 primary reclaimed water alternatives identified in Task 4.3. The following will be considered in the development, modeling, and costing of reclaimed water strategies to serve potential demands:

- Reclaimed water diurnal storage needs
- Desired delivery pressures
- Operating protocols
- Water quality
- Balancing the mix of customer uses to reduce peak demand on the system

- Flexibility and redundancy to improve operation and maintenance
- System interconnections and looping
- Maintaining continual flow of water
- Need for system re-chlorination stations at pump/storage locations to maintain water quality
- End of pipe blow-off locations

#### ***Task 4.5 – Cost Evaluation of Primary Alternatives***

Once the facility improvements associated with each of the primary alternatives are developed, CDM Smith will estimate the cost of implementing each project component. Conceptual level cost estimates will be prepared for the primary alternatives. The cost evaluation will include both capital costs and operation and maintenance costs for both the treatment facilities and the storage and distribution facilities. To compare among potential alternatives to supply a particular anchor customer, a unit cost per gallon of reclaimed water demand will be calculated.

#### **Task 4 Deliverables:**

- CDM Smith will prepare a draft technical memorandum that summarizes the conceptual reclaimed water alternatives and that identifies the highest potential primary alternatives based on the analysis conducted under Tasks 4.1 through 4.5. The technical memorandum will be submitted to the City for review prior to the Task 4 workshop.
- CDM Smith will conduct a workshop meeting with City staff to present and discuss the findings of Task 4, as summarized in the draft technical memorandum.
- The technical memorandum will be finalized based on the City’s comments and will be incorporated into the final report.

#### ***Task 5 – Cost Benefit Analysis***

CDM Smith will perform a cost-benefit analysis to determine the feasibility of implementing a reclaimed water distribution system in Durham. The cost-benefit analysis will be performed for the primary reclaimed water alternatives identified in Task 4.3.

System costs, including capital and O&M costs for treatment and distribution as well as program implementation costs will be weighed against the value assigned to program benefits such as cost of advanced wastewater treatment equipment, environmental benefits of nutrient load reduction, deferment of water treatment and distribution improvements and O&M costs, and deferment of new water supply sources/infrastructure.

CDM Smith will recommend an acceptable charge for reclaimed water considering the City’s objectives in implementing a reclaimed water system and potential impacts to existing potable water revenues. CDM Smith will also coordinate with the City’s rate consultant (Raftelis) to provide information regarding reclaimed water rate structure for input into the City’s rate model.

#### Task 5 Deliverables:

- CDM Smith will prepare a draft technical memorandum that summarizes the method and results of the cost benefit analysis. The technical memorandum will be submitted to the City for review prior to the Task 5 workshop.
- CDM Smith will conduct a workshop meeting with City staff to present and discuss the findings of Task 5.
- The technical memorandum will be finalized based on the City's comments and will be incorporated into the final report.

#### ***Task 6 – Regulatory Implications***

CDM Smith will evaluate the regulatory implications of initiating a potential reclaimed water system including how compliance with the State's reclaimed water regulations impact project design elements and operational and maintenance requirements.

This scope of work includes one meeting between CDM Smith, City staff, and North Carolina Division of Water Resources (NCDWR) after potential customers are identified and when development of the conceptual reuse system has begun. Note this scope does not include detailed permitting evaluations or identification of specific permit requirements for any of the recommended projects.

#### Task 6 Deliverables:

- CDM Smith will prepare a draft technical memorandum for the City's review that summarizes the regulatory implications for implementation of the reclaimed water program.
- The technical memorandum will be finalized based on the City's comments and will be incorporated into the final report.

#### ***Task 7 – Program Implementation Recommendations***

##### ***Task 7.1 – Project Phasing***

CDM Smith will work with the City to recommend a preferred reclaimed water alternative and phasing options for implementation of the recommended reclaimed water alternative to allow the system to grow in a controlled manner. This will allow revenue to flow from the system to help implement future phases. Phasing will also consider growth projections and recommendations from the City's water and wastewater master plans.

### ***Task 7.2 - Reclaimed Water Ordinances and Standards***

CDM Smith will evaluate new ordinances, design standards, policies, and practices that will need to be developed as part of a reclaimed water program implementation, including the following:

- Provide examples to the City and recommend an approach to development of formal user agreements with large users and adoption of a reclaimed water ordinance for all customers not covered by an individual agreement.
- Review the City's existing utility design standards and identify standards that should be created/revised when developing a reclaimed water system including State (color codes, access to water, etc.) and local (distances from other utilities, operating pressures, etc.) requirements.
- Identify and recommend design guidelines to be followed when implementing the transmission system.
- Develop recommendations for cross connection control protocols to the City, including recommendations for color-coding of transmission pipes, marking of valves, minimum separations between potable and reclaimed water lines, local plumbing contractor training, and site evaluation/protocols for switching existing irrigation customers to a new reclaimed water system.

### ***Task 7.3 – Program Structure and Staffing***

CDM Smith will work with the City to provide recommendations for structuring the program and resources needed for maintenance, inspections, training, and public education activities, both for start-up of the utility and for continuing operations. Depending on the extent of the program and implementation schedule, staffing may consist of a new hire and/or a mix of reassigning existing staff responsibilities.

### ***Task 7.4 – Public Information Allowance***

The need for a public information strategy should be considered during the planning process if the initial feasibility study indicates that reclaimed water distribution is viable. The public in the early days of the project will be those parties with a direct interest in the implementation of a reclaimed water distribution system, or pilot demonstration system including the following:

- City of Durham council members and staff
- State permitting agency
- Local health department
- Local water conservation specialist
- Fire department

- Potential anchor customers
- Academia

This task includes an allowance of \$25,000 for CDM Smith to provide assistance with outreach to the 'public' parties described above after reclaimed water alternatives have been developed and evaluated. As part of this task, CDM Smith will prepare and present results of the master plan at separate meetings with the City Manager's office and the City Council. Additional assistance may include attending meetings, development or review of informational materials, or other tasks as determined by the City. Work under this allowance must be authorized by the City prior to starting.

### ***Task 8 – Draft and Final Reports***

CDM Smith will develop a phased plan of improvements, including conceptual level cost estimates, to support a Capital Improvements Program (CIP) for the City's proposed reclaimed water program. The CIP will include a list of prioritized projects with year of construction and cost.

The Master Plan report will be the compilation of detailed deliverables that have been developed for each task with the recommended CIP and will include an Executive Summary. CDM Smith will present recommendations along with estimated construction costs and a phased implementation schedule.

The final report will include detailed descriptions of each recommended improvement along with the key criteria driving the need for that improvement. This will allow the City flexibility to adjust improvements should changes be experienced in future growth or other conditions.

CDM Smith will provide an electronic copy and seven hard copies of the draft report to the City for review. One meeting is included in this task to discuss the draft report. After the meeting, CDM Smith will address comments and prepare an electronic copy and seven hard copies of the final report for the City.

### **Schedule**

All work under this contract is anticipated to be completed as given in Table 1 below. The schedule may need to be adjusted depending on the duration of customer metering data that is collected.

**Table 1 – Anticipated Schedule**

<b>Task Description</b>	<b>Anticipated Completion <sup>(1)</sup></b>
Task 1 - Kickoff Workshop, Data Collection, and Meetings	Throughout project
Task 2 - Identify Potential Reclaimed Water Use Opportunities	12 weeks from NTP <sup>(2)</sup>
Task 3 - Estimate Reclaimed Water Demand and Usage Patterns	6 weeks from Task 2 completion <sup>(3)</sup>
Task 4 - Evaluate Reclaimed Water Strategies	14 weeks from Task 3 completion
Task 5 - Cost Benefit Analysis	8 weeks from Task 4 completion
Task 6 - Regulatory Implications	8 weeks from Task 4 completion
Task 7 - Program Implementation Recommendations	4 weeks from Task 6 completion
Task 8 - Draft and Final Reports	8 weeks from Task 7 completion

**Notes:**

- (1) “Task completion” is intended to mean submittal of final task deliverable that includes City review and comment. Therefore the final completion date is dependent upon time for City review and comment.
- (2) Task 2.3 in-person interviews for potential users may be conducted at a later point in the project.
- (3) Task 3 duration may be extended depending on the amount of customer metering data to be collected in Task 3.5.

## **EXHIBIT B**

### **Insurance Requirements**

Contractor agrees to maintain, on a primary basis and at its sole expense, at all times during the life of this Contract the following applicable coverage's and limits. The requirements contained herein, as well as City's review or acceptance of insurance maintained by Contractor is not intended to and shall not in any manner limit or qualify the liabilities or obligations assumed by Contractor under this Contract.

**Commercial General Liability** – Combined single limit of no less than \$1,000,000 each occurrence and \$2,000,000 aggregate. Coverage shall not contain any endorsement(s) excluding nor limiting Product/Completed Operations, Contractual Liability or Cross Liability.

**Automobile Liability** – Limits of no less than \$1,000,000 Combined Single Limit. Coverage shall include liability for Owned, Non-Owned and Hired automobiles. In the event Contractor does not own automobiles, Contractor agrees to maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Auto Liability policy. Automobile coverage is only necessary if vehicles are used in the provision of services under this Contract and/or are brought on a City of Durham site.

**Worker's Compensation & Employers Liability** – Contractor agrees to maintain Worker's Compensation Insurance in accordance with North Carolina General Statute Chapter 97 and with Employer Liability limits of no less than \$1,000,000 each accident, each employee and policy limit. This policy must include a Waiver of Subrogation.

**Professional Liability**- Contractor agrees to maintain Professional Liability Insurance with limits no less than \$1,000,000 per occurrence, covering claims arising out of professional architect, engineers and surveyors services performed in connection with this contract.

**Environmental/Pollution**- Contractor agrees to maintain Environmental/Pollution Liability Insurance with limits no less than \$1,000,000 per occurrence and \$2,000,000 aggregate, covering claims arising out of the use or application of chemicals/herbicides as well as the negligent release of hazardous materials. Coverage may also be satisfied by endorsement to the Commercial General Liability policy with minimum limits of \$1,000,000/\$2,000,000.

**Additional Insured** – Contractor agrees to endorse the City as an Additional Insured on the Commercial General Liability. The Additional Insured shall read 'City of Durham as its interest may appear'.

**Certificate of Insurance** – Contractor agrees to provide City of Durham a Certificate of Insurance evidencing that all coverage's, limits and endorsements required herein are maintained and in full force and effect, and Certificates of Insurance shall provide a

minimum thirty (30) day endeavor to notify, when available, by Contractor's insurer. If Contractor receives a non-renewal or cancellation notice from an insurance carrier affording coverage required herein, or receives notice that coverage no longer complies with the insurance requirements herein, Contractor agrees to notify the City within five (5) business days with a copy of the non-renewal or cancellation notice, or written specifics as to which coverage is no longer in compliance. The Certificate Holder address should read:

City of Durham  
Attn: Department of Water Management  
101 City Hall Plaza  
Durham, NC 27701

The Certificate of Insurance must be uploaded into On Base for Risk Management's approval.

**Umbrella or Excess Liability** – Contractor may satisfy the minimum liability limits required above under an Umbrella or Excess Liability policy. There is no minimum Per Occurrence limit of liability under the Umbrella or Excess Liability, however, the Annual Aggregate limits shall not be less than the highest 'Each Occurrence' limit for required policies. Contractor agrees to endorse City of Durham as an 'Additional Insured' on the Umbrella or Excess Liability, unless the Certificate of Insurance states the Umbrella or Excess Liability provides coverage on a 'Follow-Form' basis.

All insurance companies must be authorized to do business in North Carolina and be acceptable to the City of Durham's Risk Manager.