CCNA2018 WORK ORDER 02

RECLAIMED WATER MASTER PLAN

This Work Order Number ___ is entered into as of this ___ day of _____, 201_, pursuant to that certain Continuing Consulting Engineering Services Agreement for Professional Services entered into as of this 17th day of April, 2018 (collectively referred to as the "Agreement"), by and between INDIAN RIVER COUNTY, a political subdivision of the State of Florida ("COUNTY") and Atkins ("Consultant").

The COUNTY has selected the Consultant to perform the professional services set forth on Exhibit A (Scope of Work), attached to this Work Order and made part hereof by this reference. The professional services will be performed by the Consultant for the fee schedule set forth in Exhibit B (Fee Schedule), attached to this Work Order and made a part hereof by this reference. The Consultant will perform the professional services within the timeframe more particularly set forth in Exhibit C (Time Schedule), attached to this Work Order and made a part hereof by this reference all in accordance with the terms and provisions set forth in the Agreement. Pursuant to paragraph 1.4 of the Agreement, nothing contained in any Work Order shall conflict with the terms of the Agreement and the terms of the Agreement shall be deemed to be incorporated in each individual Work Order as if fully set forth herein.

IN WITNESS WHEREOF, the parties hereto have executed this Work Order as of the date first written above.

CONSULTANT:

By: _____

Print Name: MATTHEW TAYLOR

Title: VICE PRESIDENT

BOARD OF COUNTY COMMISSIONERS OF INDIAN RIVER COUNTY

By: _____
, Chairman

BCC Approved Date: _____

Attest: Jeffrey R. Smith, Clerk of Court and Comptroller

By: _____
Deputy Clerk

Approved: _____
Jason E. Brown, County Administrator

Approved as to form and legal sufficiency: _____
Dylan T. Reingold, County Attorney

Indian River County
Reclaimed Water Master Plan
Scope of Services

IRCDUS desires to expand its reclaimed water system and has requested ATKINS to update a detailed Reclaimed Water Master Plan.

The proposed scope of services includes the following tasks.

Task 1 Data Collection

Objective: Obtain the necessary data required for development of the Reclaimed Master Plan. Data may be summarized in sections of the Master Plan document or may be used as inputs to model development.

ATKINS and IRCDUS will work together to identify data and compile a list of documents that may be needed to complete the Reclaimed Water Master Plan. It is assumed that data relevant to the Master Plan will be in databases, GIS, and spreadsheets. It is anticipated that the data collection should be completed within a four-week time period. After the initial data is collected, ATKINS will identify data that is missing or data that will need additional efforts to collect. This data will subsequently serve as the basis for the development of the hydraulic models that will be used to help in developing and evaluating reclaimed alternatives. IRCDUS AND ATKINS will agree on a time to freeze all data inputs and updates for Master Planning purposes.

The following data will be gathered from IRCDUS and other public sources for use in the Master Planning efforts. The level of effort for this task assumes that this information is readily available, accessible and complete for the purposes of this Master Plan:

- Reports on existing facilities as completed by IRCDUS 's other Consultant(s), including but not limited to, the latest edition of the reclaimed water master plan, facility asset information, and related studies.
- Existing permits for reclaimed facilities, including FDEP operating permits.
- Growth projections and future reclaimed water demands will be obtained from the IRCDUS planning and related internal departments.
- GIS mapping data containing land use and population projections by parcel and containing a road/street database complete and detailed enough for the geocoding process.
- GIS data containing pipelines, facilities, service areas, roads, etc., that will be necessary for completion of the Master Plan.
- Existing hydraulic models with associated databases for the reclaimed water systems.
- Reclaimed Water billing and customer information to supplement the overall projections developed in the UF Bureau of Economic and Business Research (BEBR), to be used in the Master Plan.
- Historical monthly reclaimed water billing data and water production data in electronic

format by major plant (or service area).

- Historical water quality data, for wastewater and reclaimed water.
- Pump curves of the high service pumps, size and operating levels of the storage tanks, pertinent yard piping, and other information needed to mimic the WWTPs reclaimed facilities in the hydraulic model.
- Hydrologic flow and stage records and relevant statistics (daily time series, monthly average and median flows, *etc.*).
- Reclaimed water quality records and relevant statistics (weekly/monthly time series, monthly average and median concentrations, *etc.*) for water supply sources.
- Data concerning existing effluent disposal systems and future reclaimed water systems anticipated, regarding IRCDUS 's reclaimed water system.
- Historical operations and maintenance (O&M) cost data by major categories.
- System maintenance and failure records including pipe break reports, any pipe replacement or rehabilitation, and other maintenance history information.
- Known interconnections from other systems that have master meters capable of providing accurate flow data.
- Summaries of key interlocal agreements, developer agreements, and agreements with cities, counties or utilities as IRCDUS wants considered in the Master Plan. Generally, service area boundaries will be sufficient for planning purposes.
- Copy of IRCDUS recent bid data for reclaimed water projects.

Task 2 GIS Data Gathering and Analysis, Service Area Analysis, and Demand Projections

Objective: Gather and analyze GIS data for use in the Master Planning process and develop reclaimed water demands for the forecast period.

Subtask 2.1 GIS Data Gathering and Analysis

Subtask 2.1.1 GIS Information Gathering

This subtask will be one of the first items to be initiated after the kickoff meeting. This subtask will serve to collect existing IRCDUS GIS files that will serve as the basis for the hydraulic model and to collect IRCDUS demographic and planning GIS files to support the population and demand projection efforts. Our approach includes on-site time to review the GIS data with key staff to better understand the current state of spatial data collection within IRCDUS.

Subtask 2.1.2 GIS Information Gathering - Other

ATKINS will meet with the following agencies to collect additional GIS related files that will support the Master Planning effort. They are:

- St Johns River Water Management District (SJRWMD)
- University of Florida Bureau of Economic and Business Research (UF BEBR)

Subtask 2.1.3 GIS Data Summary Workshop

ATKINS propose conducting a GIS data summary workshop meeting to review with IRCDUS, the results of the data gathering effort. The purpose of the meeting will be to agree on the data collected and identify additional data "deficiencies" that will need to be collected to develop and/or enhance the Master Planning or modeling effort and robust enough for future inclusion in asset management (CMMS) and enterprise GIS implementation. If these data are critical to

the Master Planning task, and are not available, ATKINS will identify additional services that may be needed to fill these needs.

Subtask 2.2 Service Area Analysis and Demand Projections
An evaluation will be conducted on whether sections of the service area are economically, hydraulically feasible and worthy of including reclaimed water service. Demand projections will be omitted from areas that deem not feasible. The development of reclaimed water demands will include service areas confirmed feasible for reclaimed water distribution.

Subtask 2.2.1 Review of Previous Master Plans
ATKINS will review and summarize the most current master planning documents for reclaimed water. The demand data used for previous master planning efforts will be summarized and categorized land uses identified for the demand development.

Subtask 2.2.2 Growth Projection Evaluation
Future growth projections will be developed from data published by the University of Florida Bureau of Economic and Business Research (BEBR) and the SJRWMD population projections, as well as discussions with IRCDUS. ATKINS will utilize the current IRCDUS Land Plan to categorize each parcel within IRCDUS 's service areas. ATKINS will participate in one meeting with staff from the IRCDUS Planning Department to identify planned development and projected growth through the 20-year planning period.

Subtask 2.2.3 Current and Historical Data Review
ATKINS will review and summarize IRCDUS 's current reclaimed water billing data; historical reclaimed water production; historical wastewater treatment; and SCADA at the reclaimed water pump stations.

Subtask 2.2.4 Development of Demands/Flows
Utilizing the demand and flow data compiled in Subtasks 3.2.1 through 3.2.3, ATKINS will develop current and projected reclaimed water demands for IRCDUS 's service areas. ATKINS will develop low, medium, and high demand projections through a collaborative effort with IRCDUS. Reclaimed water demands will consist of average day, maximum day, and peak hour scenarios. The demands and flows will be developed in such a manner as to be useful in the reclaimed water distribution system model (*i.e.* within areas and nodes - of the reclaimed water system). Projections will include 5, 10, and 20-year horizons.

Subtask 2.2.5 Demand Projection Workshop
ATKINS will develop a summary of the population / demand forecast data and will prepare and facilitate a workshop with IRCDUS to review the various agency demand forecasts. The purpose of this workshop is to secure IRCDUS concurrence with demand projections.

Subtask 2.3 Technical Memorandum
ATKINS will summarize the GIS data collected in Task 3.1 and the demand projections developed in Task 3.2 in a Technical Memorandum. The Technical Memorandum will identify any deficiencies that require additional research or effort to collect or develop. Three copies of the draft Technical Memorandum will be submitted to IRCDUS for review. Comments received

on the draft Technical Memorandum will be incorporated into the Master Plan. One copy of the draft Technical Memorandum will be provided in Portable Document Format (PDF).

Task 3 Hydraulic Modeling

Objective: Obtain copies of existing hydraulic models from IRCDUS (assumed WaterCAD), review, update and run hydraulic models for the reclaimed water system.

ATKINS will obtain and review the existing system hydraulic models developed by prior IRCDUS CONSULTANT(S) and recommend modifications or enhancements, prior to updating the models, model assumptions, and growth projections. Atkins will identify data that is missing or data that will need additional efforts to collect, which may require additional services.

Subtask 3.1 Hydraulic Models Setup

This task consists of preparing the existing hydraulic model for IRCDUS 's reclaimed water system. The model elements that will be reviewed include pumping facilities, storage tanks in the system, and major transmission/distribution lines (6-inch and larger pipe).

ATKINS assumes that the GIS, CAD, and record drawing files that are available and to be provided by IRCDUS are complete with the attributes (*i.e.* diameter, pipe material, coordinates, fittings with sufficient resolution, pump station locations) required for the creation of the hydraulic models. ATKINS also assumes that the files have undergone a quality assurance/quality control (QA/QC) process by IRCDUS. Atkins also assumes that the GIS of the modeled pipes and nodes were checked for connectivity (*i.e.* gaps and overshoots/undershoots have been eliminated). ATKINS included 80 hours in the budget for quality control of these files and to incorporate this data into the hydraulic models.

This scope of work does include effort to input the appropriate characteristics of plants and pump stations into the models relative to steady-state modeling approaches and does not include effort to add existing pipes to the models that are not present in the GIS files. Additionally, the SUBCONSULTANT has included limited time to interview IRCDUS staff to obtain insight on system issues and characteristics related to the modeling.

Subtask 3.2 Hydraulic Models Validation

Of critical importance to the use of any hydraulic model as a predictive tool is a comprehensive validation effort. ATKINS shall calibrate the current hydraulic model to observed actual conditions derived from IRCDUS's SCADA system as part of past master planning efforts. An allowance of 40 hours has been included to perform validation through hydraulic model analyses using available flow monitoring and SCADA data. Additional effort required beyond the allowance will require an amendment to this Scope of Work.

Subtask 3.3 Development of Future Model Scenarios

ATKINS will incorporate three future demand scenarios into the model using demand data for the 5, 10 and 20 demand years. The general modeling approach to develop Master Plan recommendations includes:

Subtask 3.3.1 Reclaimed Water Model
ATKINS will perform hydraulic modeling analyses to identify areas in the system with possible deficiencies in the distribution system during present and future demand scenarios. These locations will be identified by running the system under peak-hour demand conditions, using a criterion of a minimum pressure of 45 psi at all locations. Areas of low pressure will be identified, and additional piping recommendations will be provided to alleviate the issues.

The hydraulic model will be used to evaluate alternatives needed to meet future reclaimed water demands. Improvements may consist of new reclaimed water mains; new pumps at existing pump stations, new booster pump stations, and new storage tanks. Attention will be made to HSPs, GSTs and SCADA controls that may be needed, as a result of the modeling analysis.

Subtask 3.4 Technical Memorandum
ATKINS will develop a Technical Memorandum summarizing the results of the hydraulic modeling. Three copies of the draft Technical Memorandum will be submitted to IRCDUS for review. One copy of the draft Technical Memorandum will be provided in Portable Document Format (PDF). A half day workshop with IRCDUS will be conducted to review the draft Technical Memorandum and hydraulic modeling. Comments received on the draft Technical Memorandum will be incorporated into the Master Plan.

Additionally, ATKINS will provide IRCDUS with digital copies of final model scenarios.

Task 4 Review Regulatory Compliance Considerations

Objective: Identify regulatory compliance issues that will have an effect on the Reclaimed Master Planning process.

Current and future regulations and permitting requirements will be important considerations in maintaining and expanding the existing system. In this task, ATKINS will identify regulatory issues that may be relevant to the Master Plan. Information relative to these acts, rules, or programs within the context of master planning will be briefly summarized in a Technical Memorandum.

This work will be accomplished through the following subtasks:

Subtask 4.1 Existing Regulations
Summarize existing regulations (federal/state/local) regulations concerning reclaimed water including cross connection control program offered by the County. Existing reuse connection requirements are defined in County's existing Land Development Regulation (LDR) Section 918.06. Consultant will summarize any proposed changes that may be required to this section of LDR as result of the master plan. County will undertake the process to make the changes to the LDR.

Subtask 4.2 Existing and Pending Permits
Summarize existing permits, as well as, any pending or future permits that will be required for reclaimed water supply and quality, and facility siting (federal/state/local), covering the same categories as listed above.

Subtask 4.3 Future and Pending Regulations
Summarize pending regulations and permits (currently drafted but not promulgated). For example, there are several currently pending federal regulations governing groundwater and distribution systems that should be considered before any facility upgrades (Emerging Contaminants, Numeric Nutrient, Ground Water Rule, Total Coliform Rule, Water Treatment Residuals, and Stage 2 Disinfection Byproducts Rule).

Subtask 4.4 Contact State and Federal Regulators
Review the regulatory and permitting summary through meetings with state/local regulators and phone calls with federal regulators. These meetings/phone calls will not be extensive but geared to understand regulators thinking on pending and future regulations.

Subtask 4.5 Technical Memorandum
The impact of current and future regulations to IRCDUS identified from Subtasks 5.1 through 5.4 will be summarized in a Technical Memorandum which will be submitted to IRCDUS for review and comment. Three copies of the draft Technical Memorandum will be submitted to IRCDUS for review. One copy of the draft Technical Memorandum will be provided in Portable Document Format (PDF) on a CD. Comments received on the draft Technical Memorandum will be incorporated into the Master Plan.

Task 5 Development of Construction Cost Estimates

Objective: Development of estimates of probable construction costs across all of IRCDUS 's asset classes, to create an equitable assessment of costs for project comparisons and prioritization.

ATKINS will provide the following services related to development of a standardized method for establishing estimates of probable construction costs:

ATKINS will review and summarize recent bid data collected by IRCDUS to initiate the development of standardized costs for individual items typically associated with the construction of reclaimed systems. These items will include, but may not be limited to, excavation and backfill, pipeline materials and installation, valves, pump stations, storage tanks, and ancillary items such as roadway repair and resurfacing.

ATKINS will review and summarize its own recent bid data (gathered from the region –Florida and Georgia) in similar construction site environment and project types.

ATKINS will summarize the data obtained and reviewed in tabular form. The costs will be tied to the date the Master Plan work is completed. The table will include bid item descriptions and unit costs, along with any assumptions made in the development of the estimated costs. The data will be tied to a regional index (either using ENR's adjusted construction cost index, or a similar index) to allow for the escalation of costs for projects recommended in future capital improvement plans (*i.e.* when looking at the master plans during the planning period, costs will be able to be re-estimated closer to the actual date of implementation). The summary will also include guidance regarding relative contingency levels/ranges for probable construction costs (as projects progress from master planning to design and construction) as well as standardized unit item classifications for typical collection and distribution system projects (i.e. standardized form that resembles a bid tabulation). Three copies of the draft Construction Cost Estimate

Summary Technical Memorandum will be submitted to IRCDUS for review. One copy of the draft Technical Memorandum will be provided in Portable Document Format (PDF) on a CD. Comments received on the draft Technical Memorandum will be incorporated into the Master Plan.

Task 6 Evaluation and Findings Workshop

Objective: Conduct a workshop with IRCDUS staff to compare alternatives and select a recommended plan.

ATKINS will prepare for and conduct a workshop to go over the findings, alternatives, and recommendations of the tasks supporting the Master Plan. One of the goals of the workshop will be to compare reclaimed water alternative costs and non-cost factors and to select the recommended plan. Preparation for this workshop will include the development of maps, graphics and tables of costs and non-cost factors for the alternatives. The purpose of the workshop will be to select a recommended plan. A one-day workshop with IRCDUS staff will be included. ATKINS will prepare a summary of the workshop noting information presented and decisions made.

Task 7 Development of a Comprehensive Master Plan

Objective: The Master Plan will compile the system evaluation and planning information from the asset classes into a single document and will include a comprehensive capital improvement plan spanning the asset classes.

ATKINS will compile a Master Plan covering IRCDUS 's reclaimed water treatment systems. ATKINS will develop the Master Plan based on the results of the tasks included in this Scope of Work.

Subtask 7.1 Draft and Final Version of the Master Plan
ATKINS will prepare one draft and the final version of the Master Plan as described in this section. The document will include the following sections:

- **Executive Summary** – The CONSULTANT will prepare an Executive Summary of the Master Plan.
- **Introduction** – ATKINS will develop and prepare an introduction that will include a brief outline of the Master Plan, including goals and objectives and brief descriptions of the subsequent sections.
- **Development of Reclaimed Water Demands** –The section will include a summary of the work completed under Task 3 of this Scope of Work. Current and future land use (coordinated with local land plans); development of typical reclaimed water demands; and estimates of future demands and applicable peaking factors at 5-year, 10-year, and 20-year planning horizons.

- **Development of Construction Cost Estimates** - Atkins will develop and prepare this section of the Master Plan. The section will include a summary of the work completed under Task 6 of this Scope of Work. The section will summarize the methodology developed and summary of the "typical" opinions of probable construction costs used in the evaluation of the individual asset class facilities.

- **Wastewater Management** - Atkins will develop and prepare this section of the Master Plan. This section will include a description of the IRCDUS 's wastewater treatment facilities.

- **Reclaimed Water System** – Atkins will develop and prepare this section of the Master Plan. This section will include a description of the IRCDUS 's reclaimed system under current and future demands; recommendations for improvements for storage, reclaimed mains, and pumping facilities in 5-year, 10-year, and 20-year planning horizons; opinions of probable construction costs; and prioritized recommended improvements.

- **Comprehensive Recommendations and Implementation Plan** - Atkins will develop a Comprehensive Recommendations and Implementation Plan, which will prioritize the recommended improvements for IRCDUS 's reclaimed water system. Atkins will develop a Comprehensive Recommendations and Implementation Plan by combining the recommendations of the various asset class facilities into a single plan developed to achieve IRCDUS 's overall goals and objectives.

- Atkins will develop the recommended plan in sufficient detail to recommend capital improvement projects for the planning period, but with particular emphasis on the first 5 years, the second 5 years and the 10-year increment thereafter. It is in this task that phasing will be developed for the recommended plan. The hydraulic models will be used to analyze needs in five-year increments. Proposed road improvements will be considered in developing the phasing plan.

- Three copies of the Draft Master Plan will be prepared for IRCDUS review. Comments received on the Draft Master Plan will be incorporated into the Final Master Plan. This scope assumes only one revision to the Master Plan will be prepared (one Draft and one Final). Three copies of the final document will be prepared. IRCDUS will consolidate all internal review comments and submit to CONSULTANT. One copy of the final report will be provided in Portable Document Format (PDF) on a CD. Electronic files with pertinent hydraulic pipe model runs and GIS files will be provided.

- Upon finalization of the master planning document with CIP development and cost estimates, funding requirements, identification of funding sources, and a rate structure analysis will be completed separately in Phase II of the Reclaimed Water Master Plan.

Task 8 Project Management

Objective: ATKINS will manage the Master Planning effort and update IRCDUS Management and staff on a periodic basis to communicate the progress of the project.

Consists of the overall project management related to CONSULTANT's internal financial, schedule and status reporting; development of subconsultant scopes; subconsultant contractual matters; interdisciplinary and team communication related to drawings, computer file, and specifications; and review conferences with IRCDUS and agencies and related documentation.

ATKINS will perform the following tasks as part of the project management:

- Perform general project coordination and management activities, including general administrative activities for this authorization, as well as specific coordination activities with the team members, including IRCDUS and associated key staff members.
- Prepare and submit to IRCDUS progress report, project schedules and invoices for this assignment. Progress Reports and updated project schedules will be prepared and submitted to IRCDUS on a monthly basis to advise and highlight the overall progress of the Master Planning activities, as well as identify items completed, and on-going and pending activities. The monthly progress reports will also include a summary description of the pending activities, any potential issues identified, any potential impact to the schedule, any potential change in scope of services, and a summary of information and actions needed by IRCDUS. The monthly progress reports will include percent completes for each task and for the overall project. These reports will be submitted by the second to last Friday of each month.
- Conduct general project meetings during the course of the work (with a budget of 6 meetings).

III. SCHEDULES AND TIME CONSTRAINTS

Within ten days after the execution of the Work Order, the CONSULTANT shall provide a detailed project schedule with start and finish dates. The proposed preliminary schedule, shown below, will commence from the execution of the Work Order and will be updated to include dates.

FIGURE 1
IRCDUS Reclaimed Water Master Plan Schedule

	1	2	3	4	5	6	7	8	9	10	11	12
Project Plan and Kickoff Meeting	x											
1. Data Collection	x											
2. GIS Data Gathering and Analysis, Service Area Analysis, and Demand Projections		x	x									
3. Hydraulic Modeling				x	x	x			x			
4. Review Regulatory Compliance Considerations				x	x							
5. Development of Construction Cost Estimates								x				
6. Evaluation and Findings Workshop										x		
7. Development of a Comprehensive Master Plan											x	x
8. Project Management	x	x	x	x	x	x	x	x	x	x	x	x

IRCDUS
Reclaimed Water Master Plan

Fixed Fee Tasks

Task		Project Director	Senior Engineer III	Engineer I	Senior Designer II	Senior GIS Analyst	Administrative Assistant	Total Hours	Total @ Billing Rate
		$ 215.00	$ 175.00	$ 116.00	$ 130.00	$ 145.00	$ 85.00		
		Hours	Hours	Hours	Hours	Hours	Hours		
0	Project Work Plan and Kickoff Meeting	4	24	12	6	0	8	54	$ 7,912.00
0.1	Work Plan		16	8	6		6		
0.2	Kickoff Meeting	4	8	4			2		
1	Data Collection	2	4	24	0	0	8	38	$ 4,594.00
1.0	Data Collection	2	4	24			8		
2	GIS, Service Area, and Demand Projections	10	0	20	0	18	0	48	$ 7,080.00
2.1	GIS Data Gathering and Analysis	4		12		10			
2.2	Service Area Analysis and Demand Projections	6		8		8			
3	Hydraulic Modeling	10	4	86	0	0	30	130	$ 15,376.00
3.1	Hydraulic Models Setup			24			4		
3.2	Hydraulic Models Validation			30			2		
3.3	Development of Future Model Scenarios	4		24			8		
3.4	Technical Memorandum	6	4	8			16		
4	Review Regulatory Compliance Considerations	2	16	72	0	0	16	106	$ 12,942.00
4.1	Existing Regulations	2	2	24			2		
4.2	Existing and Pending Permits		2	8			2		
4.3	Future and Pending Regulations		4	16			2		
4.4	Contact State and Federal Regulators		4	16			2		
4.5	Technical Memorandum		4	8			8		
5	Development of Construction Cost Estimates		10	0	0	0	4	14	$ 2,090.00
5.0	Development of Construction Cost Estimates		10				4		
6	Evaluations and Findings Workshop	16	0	0	0	0	15	31	$ 4,715.00
6.0	Evaluations and Findings Workshop	16					15		
7	Development of a Comprehensive Master Plan	40	40	130	24	0	60	294	$ 38,900.00
7.0	Draft and Final Version of the Master Plan	40	40	130	24		60		
8	Project Management	8	80	0	0	0	40	128	$ 19,120.00
8.0	Project Management	8	80				40		
	Total Hours	92	178	344	30	18	181	843	
	Total Labor Amount								$ 112,729.00
	Subconsultant Labor (KMAC Consulting)								$ 59,680.00
	Total Expenses								$ 2,500.00
	Grand Total Fixed Fee								$ 174,909.00