AGREEMENT FOR PROFESSIONAL SERVICES FOR WATER PLANT AND WATER RESOURCES ENGINEERING SERVICES RFQ2019070
WORK ORDER_____

Indian River County Utilities Department
Wellfield and Alternative Water Supply Evaluation

This Work Order Number ___ is entered into as of this ___ day of _____, 202_, pursuant to that certain AGREEMENT FOR PROFESSIONAL SERVICES FOR WATER PLANT AND WATER RESOURCES ENGINEERING SERVICES RFQ2019070 entered into as of this 5th day of November, 2019 (collectively referred to as the "Agreement"), by and between INDIAN RIVER COUNTY, a political subdivision of the State of Florida ("COUNTY") and Kimley-Horn and Associates, Inc., ("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: Brian Good

Title: Director|Principal

BOARD OF COUNTY COMMISSIONERS OF INDIAN RIVER COUNTY

By: _____
Joseph E. Flescher, 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

EXHIBIT A

Wellfield and Alternative Water Supply Evaluation

PROJECT UNDERSTANDING

Indian River County Utilities (IRCU) owns and operates two (2) regional Water Treatment Plants (WTPs , Hobart (North) and Oslo (South), that provide potable water to IRCU customers. Each WTP has a wellfield that supplies groundwater from the Upper Floridan Aquifer (UFA) to the WTP. Groundwater withdrawals for treatment are monitored as part of IRCU's Consumptive Use Permit (CUP) through the St. Johns River Water Management District (SJRWMD).

IRCU's CUP allows for average daily withdrawals of up to 12.838 MGD. IRCU anticipates that expected water demands over the next 20-30 years will require an increase in the CUP allocation to 23.18 MGD, which may change based on population growth, service area boundaries or other factors such as unaccounted for water losses, etc. IRCU desires to obtain this additional allocation from sources meeting all of the SJRWMD's CUP criteria. As such, the following conceptual options need to be explored to achieve additional permittable source water supply to the WTPs:

1. Expand IRCU's wellfields in a way that does not impact ELUs
2. This may include a third and/or separate wellfield located to the west of the existing Hobart (North) and Oslo (South). This third or separate wellfield may connect to either North County and/or South County WTP's. Or a new WTP may be constructed to accompany this new wellfield.
3. Possible deepening UFA wells to APPZ (Avon Park Permeable Zone), or Lower Floridan Aquifer (LFA) at Hobart and Oslo

    Wellfields Considered:

    i. North (Hobart) existing UFA wellfield
    ii. South (Oslo) existing UFA wellfield
    iii. North (Hobart) offsite new UFA/LFA/APPZ wellfield
    iv. South (Oslo) offsite new UFA/LFA/APPZ wellfield

Each of these concepts carry impact to IRCU water system, including capital costs, operating costs, impacts to existing treatment equipment, ability to blend for stabilization, concentrate disposal options, etc. Accordingly, IRCU has requested Kimley-Horn prepare a scope of services to provide evaluation of these options with respect to the IRC water and potentially wastewater systems. IRC desires a report that outlines these options, presents conceptual costs, describes significant changes to their system, and provides a hierarchy for IRC to utilize moving forward. The report is to be concluded with recommended hierarchy to achieve desired increase in CUP capacity consistent with regulatory requirements.

Consultant will utilize the services of JLA Geosciences to provide hydrogeological professional services for this project. The following scope of services is provided below for this Water Supply Evaluation.

SCOPE OF SERVICES

Task 1 – Wellfield Expansion and New Wellfield Evaluation

Consultant will evaluate potential expansion of existing Hobart and Oslo UFA wellfield(s) to include new UFA wells, wellheads, piping, and pumping stations as required as long as this expansion does not impact ELU's. Consultant will evaluate feasibility of a third UFA wellfield for the Hobart WTP and/or expansion of the existing Oslo WTP wellfield. Consultant will also evaluate the need to potentially site a third/western wellfield and potential separate third WTP if that is the only option for use from an ELU standpoint if the wellfield expansion or deepening at the existing WTP's is not feasible. Consultant will prepare conceptual costs and timelines for this option if needed to be included in the evaluation matrix.

Consultant will evaluate potential well sites and raw water supply based on the following:

- IRC owned land
- ELU impacts
- Potential large landowners and developments
- Accessibility for drilling, formation water disposal
- Power supply availability
- Setback requirements (sanitary, surface waters, contaminants)
- Raw watermain routing looping potential
- Conceptual sizing of well, well pumps, electrical

Consultant will prepare GIS maps that delineate countywide ELUs, respective capacities, and aquifer from which water is withdrawn. The GIS data will be queried to delineate type and capacity of each use, and potential impact from IRCU wells in the vicinity of the ELU's. The GIS information will also be used to overlay existing IRC owned land, zoning maps, rights-of-ways, and setbacks for new wells (i.e., contaminated sites, sanitary setbacks, etc.). It is assumed that IRCU staff can provide some of this GIS information.

Consultant will prepare conceptual costs for new wells, wellheads and pumps, raw watermain, booster pumping stations. Site costs will not be included, but if IRC owned sites are selected, they will be assumed to be negligible.

Consultant will prepare a map of proposed wellsites, and conceptual piping arrangement and alignment to supply raw water to both Hobart WTP and Oslo WTP. Multiple maps may be used to depict multiple layers of information. Up to six (6) different map types may be provided in both electronic and hard copy format (24 x 36 size).

Task 2 – Test Well Evaluation of LFA and APPZ @ Oslo and Hobart

Consultant will investigate the potential use of the Avon Park Permeable Zone (APPZ) which his part of the lower Upper Floridan Aquifer (UFA), and the Lower Floridan

Aquifer, part of the boulder zone (>10,000 mg/L TDS) as an alternative water supply to supplement the existing UFA via test well evaluation. This task is intended to confirm which of the assumptions made regarding impacts to water quality is most likely to occur. This work will consist of drilling pilot hole through the existing borehole and logging water quality and yield data.

Test well evaluation will provide the following information:

- Determine confinement between APPZ, LFA and UFA
- Define source water quality and Quantity?
- Understand differences in yield/production between UFA, LFA, and APPZ
- Define potential leakance between both UFA, LFA, and APPZ

Consultant will prepare documents for test well deepening of existing wells N-7 (Hobart) and S-1 (Oslo) and provide coordination with potential well drillers to conduct the work.

Consultant will assist IRC purchasing department to solicit price proposals to perform the work. Consultant will respond to reasonable number of questions from prospective bidders.

Consultant, along with subconsultant JLA Geosciences, Inc. will review price proposals/bids from contractors and prepare bid review letter.

Consultant will review schedule prepared by the Contractor, provide coordination with IRCU operations and subconsultant, JLA Geosciences, and provide oversight of the well deepening procedures and activities.

Consultant will provide hydrogeological support and observation services during Upper Floridan Aquifer well deepening, including pilot hole drilling and reaming, geophysical logging, completion interval drilling and associated testing, preliminary well development, acid treatment, pump development and testing, post rehabilitation development testing and specific capacity testing.

Consultant will also provide well performance testing, including water level measurements, specific capacity analysis, and basic water quality testing (conductivity, chlorides, silt density indices~SDI's and sand testing). Consultant will provide up to 140 hours of on-site hydrogeological services (JLA) for well deepening.

Consultant will review data and prepare supporting information and technical evaluation into merits of deepening the wells, consisting of the following:

- Reverse Air Drilling and field testing for 2 UFA Wells
- Geophysical logging and video for 2 wells.
- Pump Testing AAPZ/ LFA?
- Pumping test UFA (data partially available from North County APT testing – Task 6)
- Data review and recommendation for rehabilitation including backfill depth, acid

treatment plan N7&S1.
- Acidization and/or backfill oversight
- Development
- SDD Testing
- Final Video

Consultant will respond to contractor questions, provide written responses for IRC to process for the findings from the deepening activities.

Consultant will meetings and make onsite site visits for each of the two (2) existing wells to be deepened; provide coordination during construction, review of individual well geophysical and video logging, review contractor's submittals including acid treatment plan, onsite hydrogeologic observation during critical elements of deepening, well logging.

Consultant will prepare a summary technical memorandum including lithologic logs and review of findings. consultant will prepare draft copies of the technical memorandum and prepare and submit a final version based on review comments provided by IRCU and stakeholders involved with the study.

Task 3 – Evaluate Impacts to Operations

Changes in raw water supply are expected to occur through additional wells, inclusion of a third wellfield, and/or deepening of existing UFA wells. The changes in source water supply will impact operations including raw water pumping, treatment, and disposal of membrane concentrate flows.

Consultant will produce reasonable assumptions for impacts from raw water quality that can be expected through deepening and verify assumptions through work conducted under Task 2. Consultant will evaluate source water quality impacts to Hobart and Oslo WTP treatment process through well deepening. Following completion of Task 2, Consultant will review water quality data acquired to confirm which assumptions most closely aligns with the water quality data observed.

Consultant will evaluate impacts to the treatment plants consisting of the following:
- Pretreatment
- Membrane treatment process
- Post-treatment (degasification & off-gas scrubbers)
- Electrical system
- Chemical and support systems
- Plant capacity increase, such as storage, HSP capacity, support systems
- Concentrate disposal

Consultant, utilizing the services of sub-consultant EW Consultants, will evaluate impacts to concentrate disposal with deepening of the supply wells and the impacts on concentrate water quality. Consultant will evaluate expansion of the North WTP and

impacts to the Spoonbill permit with current disposal capacity limited to 2.0 MGD up to 3.0 MGD, including a potential change in water quality that will occur if the determination to use the LFA for raw water is feasible .

Consultant will evaluate the potential of increasing the South WTP capacity and impacts to the 1.5 MGD permit concentrate discharge to the ATS and freshwater disposal, including a potential change in water quality if the determination to use the LFA for raw water is feasible and what impacts this has to the regulatory permit..

Consultant will review the existing demineralized concentrate (DC) permits for Oslo and Hobart to determine the potential and necessity for deep injection well disposal.

Consultant will review IRC service area to determine optimal location for deep injection well. It is desired to locate DIW in feasible location for WWTP treated effluent, DC, and potentially leachate disposal. Consultant will evaluate the dual use of the well, costs to construct a new DIW and dual zone monitor well (DZMW) that will be required as part of the DIW. Conceptual costs for a new pipeline will be provided. Pipeline routing study is not included with this evaluation.

Task 4 – Indirect Potable Reuse

Consultant will evaluate conceptually aquifer storage and recovery (ASR) and indirect potable reuse (IDPR) at the regional wastewater treatment plant to provide additional source water for potable treatment. The desktop study will evaluate the anticipated treatment and associated cost required to recharge the Upper Floridan Aquifer with reclaimed water from the wastewater treatment plant and include potential options for advanced treatment and associated costs to utilize this water resource for potable water treatment either at the Oslo Plant or at a new water treatment plant.

Evaluation will consist of ASR feasibility; expected aquifer characteristics for the ASR application; the likely permitting requirements and timeframes to permit, number of ASR wells required, expected flows and associated costs for construction and operations; deep injection well requirements for concentrate disposal potential other applications; water treatment options; water transmission requirements; and estimated costs.

Consultant will also review current and prospective future regulations, establishing water quality goals/parameters for the reclaimed water and advanced treated water, identification of advanced water treatment alternatives, and analysis of site conditions to ascertain the feasibility of integrating advanced treatment of reclaimed water at the either the West WWTP (6 MGD rating) or the Central WWTP (4 MGD rating . This evaluation will be used to develop conceptual alternatives for the implementation of advanced treatment at either facility.

Consultant will review existing and historical direct and indirect potable reuse projects throughout the United States. The treatment technologies currently used, and respective

results will be summarized and reviewed for consideration in developing alternatives for WUD's evaluation for pilot and full-scale applications.

The Consultant will evaluate up to three (3) treatment options as follows:

- description of each process train and process units,
- advantages and disadvantages of each option,
- regulatory requirements,
- public health and water quality criteria,
- experience within the industry,
- managerial best practices topics
- number of installations,
- lessons learned from past and existing facilities,
- technical and operational components,

Consultant will prepare a draft and final summary report including summary of findings, recommended alternative for treatment consideration, and implementation plan for the selected alternative for a 2.0 and 4.0 MGD treatment process facility.

IRCU will provide current reuse agreements with bulk customers that will need to be offset from the IDPR capacity.

CONSULTANT will submit six (6) copies (draft and final) of each report to IRCU for review. Review comments will be assimilated into the final report.

Task 5 – Preparation of Options Matrix

Consultant will review existing previously prepared reports regarding water supply studies. Consultant will tabulate information from the hydrogeologic modeling scenarios. Consultant will identify locations and capacity limitations for additional UFA wells within the respective Hobart and Oslo wellfields.

Consultant will identify locations and capacity limitations associated with options for a third and/or fourth, standalone wellfield. These options will consist of:

- UFA wellfield expansion (Hobart and/or Oslo)
- Deeper (LFA/AAPZ) aquifer supply wellfield/supply
- IDPR

Consultant will establish preliminary criteria for the third/fourth UFA wellfield to transfer raw water to the Hobart WTP or Oslo WTP.

Consultant will review and evaluate each of these options in whole or as supplements that lead up to a combined total 10.5 MGD of capacity allocation that would replace UFA capacity from the North Hobart WTP UFA wellfield.

Consultant will present high level costs, estimated impacts to treatment and treatment equipment, operational impacts associated with feasible scenarios. Consultant will summarize findings in a tabulated format and include graphs, tables, and maps as necessary.

Consultant will prepare a brief technical memo supporting the Well Options Matrix, along with high level recommendations that support the matrix. The matrix table will include options with the following criteria:

- Advantages/disadvantages
- Impacts to treatment
- Intangibles such as permitting, operating cost impacts, long-term sustainability, etc.
- Impacts to distribution system
- Capital costs
- Schedule impacts

Consultant will attend two (2) review meetings with IRC staff to discuss the findings from the Options Matrix. The first meeting is intended to discuss the draft matrix prior to completion of Task 2 and the second meeting is intended to finalize the matrix following completion of Task 2. Consultant will prepare and distribute meeting minutes to project team.

Consultant recognizes that CDM is assisting IRCDU in this analysis by performing groundwater modeling of various potential wellfield locations and depths. Consultant will provide information and assistance to CDM to ensure such groundwater modeling is performed accurately and timely.

Task 6 – North County Upper Floridan Aquifer Performance Testing APT) & Analysis

Consultant will conduct groundwater modeling evaluation of the Hobart wellfield APT with CDM Model and Reporting, consisting of a review and evaluation of the existing CDM model and modification of the CDM Model to simulate the Hobart APT during the same time period and pumping conditions as used for the previous JLA model and APT evaluation. Following model simulations, Consultant, along with JLA' support generate a brief technical memorandum to be submitted electronically summarizing the evaluation procedure, and results.

TIME SCHEDULE

Consultant will conduct all tasks in a mutually agreed upon schedule with the following assumptions:

TASK	Time Frame from NTP
Task 1 – Wellfield Expansion and New Wellfield Evaluation	**4 – 6 weeks**
Task 2 – Test Well Evaluation of LFA and APPZ @ Oslo and Hobart	**2 – 4 weeks**
(Well Driller Activity by others)	**6 – 8 months**
Final Report	**7 – 9 months**
Task 3 – Evaluate Impacts to Operations	**6 – 10 weeks**
(Update with APPZ water quality	**6 -8 months**
Task 4 – Indirect Potable Reuse	**8 – 10 weeks**
Task 5 – Preparation of Options Matrix	**8 -12 weeks**
(Update with APPZ data, Final Report)	**7 – 9 months**
Task 6 – North County UFA Wellfield APT	**4 weeks**

FEE SCHEDULE

We will provide these services in accordance with our Agreement for Professional Services for Water Plant and Water Resources Engineering Services – RFQ 2019070, dated November 5, 2019, by and between INDIAN RIVER COUNTY, a political subdivision of the State of Florida ("COUNTY") and Kimley-Horn and Associates, Inc., "Consultant").

The Consultant will provide professional services for Task 1 through Task 6 on a lump sum fee basis as follows:

Task No.	Task	Task Fee
Task 1	**Wellfield Expansion and New Wellfield Evaluation**	**$ 50,576**
Task 2	**Test Well Evaluation**	**$ 62,224**
Task 3	**Evaluate Impacts to Operations**	**$ 58,862**
Task 4	**Indirect Potable Reuse Evaluation**	**$ 37,708**
Task 5	**Preparation of Options Matrix**	**$ 25,316**
Task 6	**North County UFA Wellfield APT**	**$ 11,744**
	Total Lump Sum Fee =	**$246,430**

ADDITIONAL SERVICES

The following services are not included in the Scope of Services for this project, but may be required depending on circumstances that may arise during the execution of this project. Additional services include, but may not be limited to the following:

- Pilot Testing of treatment options
- Design document preparation
- Meetings beyond what is described herein
- Additional permitting support and responses to agencies
- Groundwater modeling to be provided by others

EXHIBIT B

ESTIMATE FOR ENGINEERING SERVICES

PROJECT: IRCU Water Supply Evaluation										4.15.21	
CLIENT: Indian River County Utilities											
ESTIMATOR: MDM											
DESCRIPTION:		DIRECT LABOR (MAN-HOURS									
	Wellfield Water Supply Evaluation	PRINC MDM	SEN PROF FH	REG PROF NB	DES SS)	PROF 1/2 eg/dc/gc/ag	CLK	EXP	SUB	LINE TOTAL	
NO.	TASK										
1	**WELLFIELD EXPANSION NEW WELLFIELD EALUATION**										
	Collect data on existing potential wellsites	6		8		8	2			$3,874	
	Evaluate wellsites	8		18			4			$5,064	
	GIS data input and map prepation	4	8	16	30		6			$10,274	
	Raw watermain routing	6	8	12		4	6			$6,070	
	Generate maps 6	6		6	16	4	6			$5,794	
	HYDROGEO (JLA								**19,500**	$19,500	
											$50,576
2	**TEST WELL EVALUATION @ Oslo and Hobart**										
	Coordination with well drillers	6		16			20	$500		$6,036	
	Prepare documents for deepening/testing	6		24	10		12			$7,688	
	HYDROGEO (JLA								**48,500**	$48,500	
											$62,224
3	**EVALUATE IMPACTS TO OPERATIONS**										
	Evaluate impacts to existing treatment	6	24	30	6		6			$12,834	
	Prepare list of costs, changes to operations	12	24	30	8		8			$14,724	
	DIW Siting, costing, usage description	4	12	12			4	$500		$6,304	
	Electrical CW								**10,000**	$10,000	
	EW Consultants								**15,000**	$15,000	
											$58,862
4	**INDIRECT POTABLE REUSE EVAL**										
	Site review of 2 WWTP for potential potable reuse	6		12			8	$500		$4,456	
	Review treatment options	8	20	40			12			$13,572	
	Prepare brief memo recommendations	8		12	16		12			$7,180	
	HYDROGEO (JLA								**12,500**	$12,500	
											$37,708
5	**OPTIONS MATRIX AND MEMO**										
	Prepare matrix of Options table	12		24			8	$500		$7,780	
	Meetings	6		10			8			$3,640	
	Prepare brief memo recommendations	12		20	16		12			$9,396	
	HYDROGEO (JLA								**4,500**	$4,500	
											$25,316
6	**NORTH COUNTY UFA APT**										
	Meetings	6					4			$1,744	
	HYDROGEO (JLA								**10,000**	$10,000	
											11,744
	TOTAL HOURS	122	96	290	102	16	138	$2,000	$120,000	**$246,430**	**$246,430**
	LABOR ($/HOUR	238	220	158	152	128	79		$0	$0	
	SUBTOTAL	29036	21120	45820	15504	2048	10902	2000	$126,430	$0	