2728 North University Drive, Building 2700
Coral Springs, Florida 33065
P 954-837-0030

July 9, 2025

Mr. Tim Welch, P.E.
Public Services Director
City of Pembroke Pines
Public Services Department
Division of Environmental Services
8300 South Palm Drive
Pembroke Pines, FL 33025

Subject: Raw Water Hydraulic Model – Work Order #6

Dear Mr. Welch:

The City of Pembroke Pines has requested engineering services from Carollo Engineers, Inc. covered under the Continuing Professional Services Agreement between the City of Pembroke Pines and Carollo Engineers, Inc. dated June 26, 2023. As indicated in this agreement, the City may request from Carollo from time to time, on an as-needed basis, specific professional engineering and related services for various projects and assignments.

At this time, the City wishes to update the existing hydraulic model of the raw water conveyance system that will include both the East and Central wellfields. Conditions have changed since the model was first developed, so an update of the model is needed. Once the model has been rebuilt and the results verified, the results will be used to supplement the final design of the upgrade of Well No. 6 that Carollo is currently working on.

Task 1 - Project Management

Task - 1.1 Project Management

Carollo will establish internal project controls to monitor status, budget, staffing, and schedule for the duration of the project. The project manager will communicate at least monthly, and on an as-needed basis with the City to keep them informed of the project status and to discuss upcoming tasks, deliverables, etc.

Task 1.2 - Project Meetings

Carollo will prepare meeting agendas and notes to document discussions, decisions, and work progress. Carollo will attend up to three (3), one (1) hour meetings to discuss model development, analysis, and results.

Deliverables:

- Meeting Agenda and Minutes

Task 2 – Data Collection and Model Development

Task – 2.1 Data Collection

Carollo will use GIS (if available) and as-built drawings to develop a hydraulic model of the wellfield piping in Bentley WaterGEMS software. The model will include each of the wells from the East and Central raw water wellfields and all the individual and common piping from the wells to the WTP. The Carollo team will rely on the City to collect and provide data needed to construct the model. This includes GIS data and as-built drawings of the wellfields, pump curves, any pump testing results, well operations data, WTP raw water locations and pressure conditions impacted by the analysis, and other available data necessary to construct

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an accurate model representation of the wellfield and piping systems. As part of this Carollo will review the data provided by the City to determine where additional data is necessary. Any additional requests by Carollo to the City for information will be addressed by the City. This scope does not include any hydrogeologic modeling.

Task – 2.2 Development of Hydraulic Model

Carollo will develop a hydraulic model using information provided by the City. After the model is built, Carollo will meet with the City to review the model connectivity and will confirm the configuration of the piping, valves, interconnects and other features. Two meetings with City staff will be held to review and confirm the configuration of the model. Once the model is built, calibrated and its configuration is confirmed with City staff, modeling runs will be used to evaluate different scenarios on the wellhead conditions at Well No. 6. The analysis will be limited, as it will focus on the hydraulic conditions at Well No. 6 in order to finalize the design of the new well pump. Pump curves provided by the City for the other wells that comprise the East and Central wellfields will be input into the model to conduct the modeling runs. However, the scope does not cover a hydraulic evaluation or identification of needed improvements for the other wells, other than Well No. 6. Any deficiencies found during this evaluation in other wells or piping will be noted. If pump curves are not available for some of the wells, an assumption will be made as to the input flow for that well so the model can be run and calibrated.

Task 3 – Scenario Analyses

Task – 3.1 Scenarios to be Modeled.

Carollo will create four scenarios in the model to reflect various operating conditions. These scenarios will be developed with assistance from City staff to simulate those withdrawal conditions to be most appropriate for Well No. 6 design and that also meet the permit conditions from the SFWMD. Based on the results of the scenario analysis, Carollo will adjust the preliminary design of Well No. 6 that is currently underway. If there are any shortcomings identified in the hydraulic analysis for any of the other wells, the design of any required improvements for those other wells will need to be covered in a separate task authorization(s).

Task 4 – Technical Memorandum

Carollo will develop a Technical Memorandum that outlines the model development and analysis results. The Technical Memorandum will include a description of the model development including data sources, model parameters and assumptions, scenarios, and any available calibration or field-testing data.

Project deliverables will include:

- Draft Technical Memorandum in electronic pdf format (up to two (2) versions).
- Final Summary Memorandum in electronic pdf format.
- Copy of the Hydraulic model

Schedule

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The start date for this task will be the day of approval of this change order to the original Well No. 6 Scope of Services. The overall duration of the project is anticipated to be four months.

Major project milestones include:

- Draft Technical Memorandum: 90 days from the NTP.
- Final Technical Memorandum: 150 days from NTP.

All efforts will be made to produce modeling results in a timely manner that causes the least impact to the schedule for the Well No. 6 Project. Once a NTP is issued for this work order, Carollo will incorporate the schedule shown herein into the Well No. 6 schedule to determine if there are any potential impacts to the project schedule.

Method and Amount of Compensation

Carollo agrees to accept as full compensation for the engineering services described herein the not-to-exceed amount of $76,856.00 for all the tasks. The estimated fee amount is broken down as follows.

Task Number	Task Name	Fee Amount
1	Task 1 – Project Management	$9,232.00
2	Task 2 – Data Collection and Model Development	$16,528.00
3	Task 3 – Scenario Analyses	$29,248.00
4	Task 4 – Technical Memorandum	$21,848.00
	Totals	$76,856.00

Note - For estimating purposes only. Actual time and materials may vary based on actual conditions encountered.

A breakdown of the fee amounts is provided in Attachment "A" The compensation amount and the amount to be invoiced monthly based on incurred costs are all in accordance with the Engineers' Labor Rates more particularly described in Exhibit "C" of the Continuing Professional Services Agreement.

City Responsibilities and Assumptions

Due to the nature and schedule of this project, certain assumptions apply to this Scope of Services. To the extent possible, these assumptions are stated within this document and are reflected in the budget.

1. This work does not include hydrogeological modeling.
2. If the project task requirements are different from the assumptions presented in this Scope of Services or if the City desires additional services, the resultant changes in scope will serve as a basis for amending this project assignment or initiating the development of a new project assignment as agreed upon by both the City and Carollo.

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a. Carollo shall be entitled to rely upon the accuracy of information supplied by the City without independent review of evaluation.
b. The schedule provided is based on the timely receipt of the data from City.
c. The material terms of the "Agreement for General Consulting Services" supersedes and nullifies any and all assumptions outlined below that are contrary and/or conflict with said terms and conditions in said Agreement:

i. Carollo shall perform the services required hereunder in accordance with the prevailing standard of care by exercising the skill and ability ordinarily required of consultants performing the same or similar services, under the same or similar circumstances, in the State of Florida.
ii. Carollo makes no warranty that City's actual project costs, financial aspects, economic feasibility, schedules, and/or quantities or quality realized will not vary from Carollo's opinions, analyses, projections, or estimates.
iii. Documents, including drawings and specifications, prepared by Carollo pursuant to this Service Authorization are not intended or represented to be suitable for reuse by City or others for this Project or on any other project. Any reuse of completed documents or use of partially completed documents without written verification or concurrence by Carollo for the specific purpose intended will be at the City's sole risk and without liability or legal exposure to Carollo.
iv. The services to be performed by Carollo are intended solely for the benefit of the City. No person or entity, not a signatory to this Service Authorization shall be entitled to rely on Carollo's performance of its services hereunder, and no right to assert a claim against Carollo by assignment of indemnity rights or otherwise shall accrue to a third party as a result of this Service Authorization or the performance of Carollo's services hereunder.

Personnel:

Bob Ortiz, P.E. – Corporate Officer
Christopher Reinbold, P.E. – QAQC/Technical Advisor
Evan Greenberg, P.E. - Project Manager
Sebastian Barragan – Lead Engineer
Kirsten Burns – Sr. Engineer
Shana Woody, Document Processor

We stand ready to discuss any questions you may have regarding this scope of work and look forward to working with you.

Sincerely

Carollo ENGINEERS, INC.

Digitally signed by Roberto S. Ortiz
Date: 2025.07.10 12:56:43-04'00'

Roberto S. Ortiz, P.E.

Vice President

Digitally signed by Christopher T. Reinbold
Contact Info: Carollo Engineers, Inc.
Date: 2025.07.10 09:28:07-04'00'

Chris Reinbold, P.E

Vice-President

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c: Evan Greenberg

Enclosures: Attachment “A” – Project Fees Breakdown

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ATTACHMENT "A"

PROJECT FEES BREAKDOWN

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City of Pembroke Pines
Hydraulic Model for Raw Water System
Revised Fee **21-May-25**

	Task Description	Carollo Labor Hours and Cost									
		Corporate Officer	Technical Advisor	Project Manager	Lead Engineer	Sr. Engineer	Document Processing	Total Hours	Labor Cost	Expense	Total Cost
		Ortiz	Reinbold	Greenberg	Barragan	Burns	Woody				
		$330.00	$288.00	$252.00	$191.00	$218.00	$108.00				
1	Project Management	4	0	24	0	0	8	36	$8,232.00	$ 1,000.00	$9,232.00
2	Data Collection and Model Development	0	4	16	48	8	4	80	$16,528.00	$ -	$16,528.00
3	Scenario Analyses	4	8	16	88	16	12	144	$29,248.00	$ -	$29,248.00
4	Technical Memorandum	4	8	16	32	16	24	100	$19,848.00	$ 2,000.00	$21,848.00
	TOTAL HOURS	**12**	**20**	**72**	**168**	**40**	**48**	**360**			
	TOTAL COST	**$3,960.00**	**$5,760.00**	**$18,144.00**	**$32,088.00**	**$8,720.00**	**$5,184.00**	**-**	**$73,856.00**	**$ 3,000.00**	**$76,856.00**