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May 16, 2023

Mr. J. Sidney Forsyth
Director
Cartersville Water Department
City of Cartersville
P.O. Box 1390
Cartersville, GA 30120

RE: Cartersville Water Treatment Plant
Rehabilitation and Expansion to 37 MGD

Dear Sidney:

We appreciate the opportunity to provide a proposal for engineering services to the City of Cartersville (City) Water Treatment Plant (WTP) for rehabilitation and expansion of the treatment capacity to 37 MGD. If acceptable, this work will be performed under our current Agreement for General Engineering and Consulting Services with the City.

Project Understanding and Background

The purpose of the project is the rehabilitation and upgrade of the existing WTP so that it can run continuously at 37 MGD with the largest treatment unit out-of-service (O/S).

The Walker Water Treatment Plant (WTP) treats raw water withdrawn from Lake Allatoona and supplies it to the City of Cartersville and parts of Bartow County. The WTP treats raw water withdrawn from Lake Allatoona (an impoundment on the Etowah River) under Permit No. 008-1491-06, issued by the State of Georgia Department of Natural Resources - Environmental Protection Division (EPD). The City was also issued a second withdrawal permit by EPD (Permit No. 008-1423-04) to withdraw raw water directly from the Etowah River. The City has existing facilities to withdraw raw water directly from the Etowah River but no permanent pumps for the WTP. See Figure 1 for a location map of the WTP and raw water intakes.

The current WTP was constructed in 1970 with three filters to replace a much older filter plant with a capacity of 6 MGD. There have been three flow capacity expansions to the facility in 1974, 1991, and 2000 to increase the plant peak capacities to 12 MGD, 21 MGD, and 27 MGD, respectively. Those expansions did not include significant rehab projects. A conditional assessment of the WTP was also conducted in 2018, where structural and electrical improvements were recommended to various structures and components.

The WTP operates under Permit No. CS015002, issued by the EPD. The permit has a daily maximum operating capacity of 27 MGD (18,750 gpm) with nine (9) filters operating at a filtration rate of 6 gallons per minute per square foot (gpm/ft²). Although the plant's capacity is rated at a maximum flow rate of 27 MGD, the plant has never operated near this capacity. A capacity verification study was conducted in 2018, and it was determined that there was a significant difference between the peak capacity and the continuous operating capacity of the plant. Furthermore, the capacity is reduced further with one filter or sedimentation basin out of service. See Table 1.1 below for the current and proposed unit process ratings of the sedimentation basins and filters.

Table 1.1 – Unit Process Rating

Description of Work	Existing Peak Rating	Existing Continuous (24 Hour) Rating	Proposed Continuous (24 Hour) Rating
Sedimentation Tanks	25.0 MGD	25.0 MGD	43.5 MGD
Sedimentation Tanks (Largest O/S)	20.5 MGD	20.5 MGD	37.0 MGD
Filters	27.0 MGD	23.4 MGD	41.6 MGD
Filters (1 O/S)	24.0 MGD	20.8 MGD	39.0 MGD

To reduce the impact on the operation of the existing WTP and meet the City's schedule for anticipated water demand, we recommend the improvements be conducted under a single contract with the following milestones and construction sequence requirements.

- The WTP shall remain in operation for the duration of construction with a minimum flow capacity of 20.5 MGD.
- Improvements to existing Basins 1-9 be performed first. Then each basin shall be tested to confirm its operating capacity.
- Construction on Basins 10 & 11 cannot start until the capacity of basins 1-9 is verified.
- Filter 10 shall be completed and in service before September 1, 2025.
- The WTP shall have a capacity of 26 MGD (continuously) by September 1, 2025.
- The WTP shall have a capacity of 37 MGD (w/ the largest unit O/S) by April 1, 2027

Scope of Services

The scope of engineering services is described below and consists of the following tasks:

- Task 1 – Design Development Report (DDR) and Permitting
- Task 2 – Detail Design
- Task 3 – Bid Services
- Task 4 – Construction Services

Task 1 – Design Development Report & Permitting

Design Development Report

We will prepare the DDR per EPD's technical guidance, and the rehab and expansion plan presented in the attached technical memo. The DDR will include the following major sections:

- Section I - Introduction
- Section II - Water Quality Considerations
- Section III - Existing Facilities
- Section IV - Design Criteria
- Section V - Proposed Improvements
- Section VI - Project Implementation

The following tasks will be completed and incorporated into the report and final detailed design to complete the DDR.

Process Flow Diagram:

The purpose of the process flow diagram is to provide an overview of existing and proposed unit process components and outline the planned treatment processes.

Hydraulic Profile:

A plant hydraulic model will be prepared using the survey data and record drawings for pipe and equipment sizes. It will estimate average and peak hydraulic capacity limitations of the existing facility and identify hydraulic bottlenecks and plant hydraulic capacities.

Chemical Feed Systems:

The purpose of this task is to perform a preliminary design for the chemical feed systems, including sizing storage tanks and feed pumps for the following:

- Alum (Coagulant)
- Hydrated Lime (pH Adjustment)
- Carbon (Taste & Odor Control)
- Fluoride (Regulation)
- Phosphate (Corrosion Control)
- Sodium Hypochlorite (Disinfection)
 - Replacement for the Chlorine Gas system.
 - With the options for both onsite generation and feeding bulk sodium hypochlorite solution.

Clearwell and UV Disinfection System Analysis:

This aims to evaluate current EPD and EPA requirements for disinfection, Clearwell storage volume, and contact time. In addition, the evaluation will include comparing and evaluating the benefits and costs of using U.V. Disinfection for part, or all, of the WTP treated water or building an additional Clearwell.

Preliminary Design and Layouts

The site layout for proposed structures and modifications to existing structures will be completed using the process flow diagram, hydraulic profile, and final selected chemical feed systems. In addition, a site plan and conceptual sketches and drawings of the proposed major unit processes will be developed and included in the DDR.

Equipment Proposals

Based on the DDR, Request for Proposals (RFPs) for major equipment and processes will be issued to vendors with the intent of incorporating the selected vendors' equipment, requirements, and recommendations into the final detailed design document issued to bidding contractors. The City will be integrally involved in preparing, reviewing vendor RFPs, and selecting vendors and equipment.

Permitting

The DDR and preliminary project documents will be used to obtain regulatory approval from EPD and local review authorities. W&S will assist with all required permitting and regulatory approvals. This will include preparing permit applications and drawings, attending meetings, and revising contract documents following agency reviews.

Review Meetings

During this project phase, monthly progress review meetings will be held with the Owner. Input and comments from the Owner will be incorporated into the DDR and final project documents.

Deliverables

W&S will create a detailed design report with the process flow diagram, hydraulic profile, and preliminary layouts for treatment process systems and buildings. In addition, the report will include a detailed design of hydraulic and process calculations, supporting figures, and tables.

Task 2 – Detail Design

Perform Required Field Surveying Services

W&S will hire a registered land surveyor (RLS) to survey the whole WTP site with adequate detail to produce the civil site and erosion and sedimentation control plans with a maximum of 2-foot contour intervals. Also, all existing above-ground features, such as structures, driveways, roads, curbing, catch basins, etc., at these sites will be surveyed and shown on the proposed construction drawings.

Additionally, W&S will hire a specialty sub-consultant (Repro Products) to complete a 3D laser scan of the existing as-built conditions of all WTP buildings and appurtenances. W&S will use these scans to produce the required engineering drawings.

Perform Geotechnical Investigation

A geotechnical investigation will be conducted at the proposed sites of the two new sedimentation basins and the chemical feed building. The geotechnical investigation will establish engineering criteria for foundation design, recommend excavation methods during construction, and identify groundwater levels. The Geotechnical Consultants will present their recommendations in a written report following their field and office investigations.

Geotechnical services (e.g., soil testing, sub-grade inspection, etc.) which may be required during construction are outside these proposed service scopes. These services will be specified in the contract documents to be furnished and paid for by the general contractor(s) constructing the work.

The precise scope of the field exploration program is not known at this time because the foundation requirements are not yet known. Therefore, we recommend a separate allowance for this work of \$120,000.

Prepare Detailed Design Drawings and Specifications

The project design drawings will progress with the preparation of a 45% Preliminary Review set; a 95% Final Review set with a cost estimate; and finally, a 100% Bid Ready set. Formal reviews will be conducted with the City staff using the 45% and 95% drawing sets.

W&S will prepare the proposed construction drawings using Autodesk's AutoCAD, Civil 3D, and Revit 3D software. These drawings, and the project specifications, will be prepared following Georgia building code standards, requirements of Georgia EPD, and accepted engineering practice.

Construction plans will include sedimentation and erosion control drawings suitable for acquiring a Land Disturbance Permit (LDP).

Specifications will be prepared per the Construction Standards Institute (CSI) format.

Review Meetings

W&S will present design drawings to the City staff at the 45%, 95%, and 100% completion levels of detailed design and meet to discuss concerns and to receive any review comments. Project deliverables will be forwarded to the City staff at least one week prior to these meetings for their internal review.

QA/QC Review

All deliverables will be reviewed and approved internally by the senior-level staff of W&S prior to their submittal to the City.

Deliverables

W&S will furnish the City with the following deliverables in this phase of the project:

- Meeting Agendas and Notes
- Subsurface Investigation Report
- Contract Plans and Specifications (45%, 95%, and 100% – Bid Ready)
- Permit Applications and Submittals, including Georgia EPD and local jurisdictions.
- Updated Construction Cost Estimate at 95% and 100% design completion.

Task 3 – Bid Services

Assist With Pre-Qualification Of Contractors And Solicitation Of Bids

W&S will assist the City with the pre-qualification of bidders, soliciting bids, and distributing construction documents (PDF format) to pre-qualified bidders.

Respond To Questions From Contractors And Suppliers During The Bid Phase Of The Project

W&S will receive, log, and respond to questions from prospective bidders and suppliers during the bidding period. If clarification of the plans and specifications is needed, all plan holders will be notified by addendum.

Issue Addenda As Required

W&S will prepare and issue any necessary addenda to general contractors and plan holders.

Coordinate and Conduct A Pre-Bid Meeting

Representatives of W&S will prepare the agenda for and conduct a pre-bid meeting with the pre-qualified bidders to help define the scope of the work to be completed.

Bid Opening Assistance & Award Recommendation

W&S will assist the City with the bid opening meeting. All bids will be checked for accuracy and tabulated. The low bidder will be identified, and a written recommendation for contract award will be provided to the City. Before recommending the contract's award, W&S will check the contractor's bonding company financial rating and capacity and ensure they are properly registered in Georgia.

Prepare Construction Ready Documents

After authorization from the City, W&S will prepare "Construction Ready" documents (plans and specifications) for execution by the general contractor selected for award. These updated documents will include changes issued by addenda and information submitted by the general contractor at bid time. Once executed by the general contractor, the validity of bonds will be checked by W&S, and the documents will be forwarded to the City for final execution.

Deliverables

W&S will furnish the City with the following deliverables for this phase of the project:

- Contractor Pre-qualification Documents
- Recommendation Letter for Pre-qualification of Contractors
- Prepare and issue Addenda (if necessary)
- Bid Tabulation
- Recommendation Letter to the City to award or reject bids
- Construction Ready Plans and Specifications

Task 4 – Construction Services

Review Shop Drawings and Submittals

All shop drawing submittals from the general contractor will be received, logged, and reviewed by W&S for compliance with the requirements of the construction contract. A timely review of shop drawings is essential to avoid costly delays. Under normal circumstances, shop drawing turnaround time will be within 30 days of receipt; complicated and more critical submittals may require slightly longer review times.

Evaluate Requests For Changes And Information

W&S will interpret contract documents and, if necessary, prepare formal change orders for execution. To assist the City, we will give our opinion of the cost for all change orders and recommend a course of action.

Assist In Interpreting Contract Drawings and Conflict Resolution

W&S will provide ongoing consultation during construction to resolve construction-related issues. This will include office support and field inspections on a regularly scheduled basis.

Coordinate and Conduct Monthly Progress Meetings

The Construction Project Manager for W&S will conduct and distribute minutes from monthly construction progress meetings with the City staff and the general contractor. The following items will be discussed at each progress meeting:

- Project schedule;
- Specific tie-ins and upcoming special meetings;
- Request for Information items;
- Payment/Construction conformance with the contract documents;
- Construction quality;
- Contract disputes and requests for changes;
- Coordination required between the contractor and other parties; and,
- Status of shop drawings, pay requests, and change orders.

The W&S Construction Project Manager will visit the site and review progress before each meeting. In addition, a preconstruction conference with the general contractor will be conducted during the first progress meeting.

Provide Periodic On-Site Field Inspections

To prepare this proposal, we have assumed that full-time resident inspection will be required for this project. The primary responsibility of the resident inspector will be to help ensure that the proposed improvements are constructed per the construction plans and specifications. The inspector's observations will be recorded in an inspection log and summarized in a site inspection report. Also, monthly pay requests from the general contractor will be reviewed and processed by the resident inspector; the inspector will also participate in all project meetings during construction.

Assist with Final Inspections and Prepare Close-Out Documents

W&S will conduct a final inspection of the construction work, during which time deficiencies will be identified and a "punch list" prepared. Follow-up inspections will also be performed to verify that corrective action has been taken.

More specifically, W&S will perform the following tasks during the final inspection:

- Inspection of the entire project to determine if any areas do not conform with the contract plans and specifications.
- Assure that all modifications have been appropriately tested.
- If necessary, make a final check of the location and grade of facilities for record purposes.
- Examine remedial work and determine if specifications have been satisfied.

After all work is completed correctly, a recommendation for acceptance of the project and final payment will be made to the City.

Prepare WTP Operation and Maintenance Manual

During construction, W&S will work with City to prepare a new Operation and Maintenance Manual (O&M) for the WTP. This new O&M will then be submitted to EPD for approval before placing any new WTP components into service.

Prepare Record Drawings

Authorized changes, as recorded throughout the construction period, will be incorporated into the engineering plans to produce a set of record drawings (a.k.a. as-built drawings). In addition, AutoCAD and PDF files of the record drawings will be provided.

ASSIST IN THE START-UP OF FACILITIES

W&S will assist the City with the start-up of the new facilities. This will include assistance with on-site staff training as needed, coordination of system operations, and startup with the general contractor.

ONE-YEAR WARRANTY ASSISTANCE

W&S will assist the City during the one-year warranty period on the project to help resolve deficient construction problems. Additionally, prior to the expiration of the warranty period, W&S will conduct an inspection of the project with the City staff to help identify any warranty items that require correction by the general contractor.

1.1 Deliverables

W&S will furnish the City with the following deliverables in this phase of the project:

- Shop Drawing Review Memos
- Construction RFI Responses
- Preparation of Construction Change Orders
- Construction Meeting Agendas & Minutes
- On-site Inspection Reports
- Review of Monthly Contractor Pay Requests
- List(s) of Outstanding/Deficient Construction Work
- Project Completion Certification
- Record Drawings

Schedule

The proposed project schedule is estimated to be as follows:

Task 1 – Design Development Report & Permitting

- All sub-tasks start with the Notice to Proceed.
- DDR Report: to be completed and submitted to EPD by December 1, 2023.
- Issue Equipment RFPs by December 1, 2023.
- Complete all EPD and local permits by March 31, 2024

Task 2 – Detail Design

- All sub-tasks start with the Notice to Proceed.

- All sub-tasks to begin concurrently with DDR.
- Bid Ready Contract Documents: May 2024.

Task 3 – Bid Services

- Advertise for Contractor Prequalification: March 2024
- Select Prequalified Contractors: April 2024
- Advertise to received contractor bids: May 2024
- Bid Opening: June 2024
- Bid Award Recommendation: July 2024
- Prepare Conformed Construction Documents: August 2024.

Task 4 – Construction Services

- Pre-construction meeting: August/September 2024.
- The WTP shall have a capacity of 26 MGD by September 1, 2025.
- The WTP shall have a capacity of 37 MGD by April 1, 2027.
- Complete Construction: June 1, 2027.

Proposed Budget

Our proposed, not-to-exceed, fee for engineering services, including allowable reimbursable expenses, as shown in Table 1.2 below, is based upon building the facilities outlined in our recent technical memorandum (copy attached). Our budgeted fee will be invoiced to the City under the terms of our current agreement with the City.

Table 1.2 – Engineering Services Costs

	Services	Subs and Expenses	Total
Task 1 – Design Development Report (DDR)	\$ 636,000.00	\$ 94,000.00	\$ 730,000.00
Task 2 – Detailed Design	\$ 2,719,000.00	\$ 781,000.00	\$ 3,500,000.00
Task 3 – Bid Services	\$ 89,000.00	\$ 28,000.00	\$ 117,000.00
Task 4 – Construction Serves	\$ 2,291,000.00	\$ 235,000.00	\$ 2,526,000.00
Cash Allowance for Geotech		\$ 120,000.00	\$ 120,000.00
		Total	\$ 6,992,000.00

If this proposal is acceptable, please let us know at your earliest convenience, and we will begin work immediately. Again, we appreciate your consideration of our firm for these services. We look forward to working with you and your staff.

Sydney Forsyth
May 16, 2023
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Sincerely,

WIEDEMAN AND SINGLETON, INC.

A handwritten signature in black ink, appearing to read 'Ahmed A. An-naim'. The signature is fluid and cursive, with a large loop at the end.

Ahmed A. An-naim

Wiedeman and Singleton, Inc.