



Shelby County
STREAMING CURRENT MONITOR BID
BID #2026-7-12676

ADDENDUM NO. 1

Date: July 28, 2026

To: All Vendors of Record

RE: Revised Bid Form and Revised Engineering Specifications

The closing date will change to August 6, 2026 at 3:00 PM. The deadline for questions will be July 30, 2026 at noon and all questions will be answered by the end of business August 3, 2026. The location will remain 200 West College Street, Room 125, Columbiana, AL 35051.

Please find the attached revised documents:

1. Updated Bid Form, replacing page 4 of the INVITATION TO BID
2. Updated Engineering Specifications, replacing pages 2 and 3 of the Engineering Specifications

BID FORM

THE UNDERSIGNED OFFERS THESE PRICES, TERMS, AND DELIVERY AS PER BID SPECIFICATIONS:

NAME OF COMPANY: _____

BY (Please Print): _____

ADDRESS: _____

PHONE: _____

By signing below, Bidder certifies the following:

Initial

Bidder has read the Invitation to Bid and Scope of Work and certifies that the goods and services offered herein meet all requisite specifications. _____

Bidder shall comply with all applicable federal, state, and local laws. _____

Bids submitted are firm and no claims for errors will be made after bids are opened and subsequent thereof. _____

Line Item	Estimated Quantity	Price Per Unit	Total
Streaming Current Sensor Monitor + Analyzer/Controller with Four Inputs	1		
Settled Water pH Probe compatible with above Analyzer/Controller	1		
Raw Water pH Probe compatible with above Analyzer/Controller	1		
		Total	

SIGNATURE: _____

Sworn to and subscribed before me this

the _____ day of _____, 202__.

Notary Public

My Commission Expires: _____

BID SPECIFICATIONS FOR: Streaming Current Monitor and Dual pH Monitoring

1. SECTION INCLUDES

A. On-line Streaming Current Monitor. The Streaming Current Monitoring (SCM) System provides continuous, real-time measurement of electrokinetic charge in a treated water sample to support the control and optimization of coagulant dosing in water treatment processes. The Streaming Current Sensor generates a Streaming Current Value (SCV), which serves as an indicator of charge neutralization effectiveness for colloidal solids and soluble, natural organic matter (NOM). The SCV output can be used for monitoring coagulation performance and for optional automated control of coagulant feed.

B. On-line pH Monitoring (two measurement points). The system shall include continuous pH measurement at two sample points on a single analyzer:

- **Raw Water pH** — measured with a pH electrode selected for raw / higher-solids source water (pH3).
- **Settled Water pH** — measured with a pH electrode selected for clarified / potable-quality process water (pH2).

Both pH parameters shall be measured, displayed, logged, and available as analog outputs and/or digital communication from the same single analyzer that simultaneously hosts the Streaming Current Sensor.

2. PERFORMANCE REQUIREMENTS

2.1 Analyzer / Controller

The analyzer shall be a multi-parameter controller capable of hosting the Streaming Current Sensor and both pH sensors simultaneously (up to 4 sensor inputs total; three are used by the Streaming Current Sensor and the two pH sensors).

The analyzer shall have a color display with on-screen graphing and internal data logging that is stored on removable storage media. Data logs shall be user-customized for sensor readings and control parameters, with logging intervals including 1, 2, 5, 10, 15, 20, 30, and 60 minutes. Up to 1 million records of data and status log entries can be stored and downloaded as a .csv file to removable storage media (e.g., microSD card).

The analyzer shall provide security login as an option to help prevent unauthorized changes from being made to settings.

Analog outputs and relays. The analyzer shall be furnished with **four (4) isolated 4–20 mA analog outputs**, freely assignable to any measured parameter or diagnostic value (e.g., SCV, raw-water pH, settled-water pH, Signal Health). In addition, the **4th sensor input shall optionally be configurable as a 5th 4–20 mA analog output** where an additional output is preferred over a fourth sensor. The analyzer shall include relay outputs and shall be capable of expansion to up to 8 relays.

The analyzer and each sensor shall be rated NEMA 4 / NEMA 4X / IP65. The analyzer shall be capable of being mounted up to 1000 ft from the sensors.

2.2 Streaming Current Sensor

The analyzer shall measure the streaming current value (SCV) of a treated water sample and have a measurement range of **-1000 to +1000 SCV**.

The analyzer shall provide a **Signal Health (0–100%)** diagnostic readout that can alert the user to signal issues caused by worn linkage, sensor fouling, electrical interference, etc. This shall include a Streaming Current (SC) Signal Waveform View, viewable directly on the analyzer display for advanced troubleshooting. Signal Health value shall also be available as a 4–20 mA output.

The analyzer shall provide a “quick zero” function that allows the operator to zero the reading from the main display with the press of a button.

The Sensor shall be capable of accepting a sample flow of 0.5 to 10 gpm. Sample inlet and outlet connections shall be 1" NPT to help accommodate higher sample flows and reduce likelihood of plugging.

The impact of sample conductivity on the sensor’s reading shall be less than 1% for a 100 µS change in conductivity.

The sensor shall have a quick replacement probe and piston which require no tools for removal. The probe shall be user serviceable and allow for replacement of the measurement surfaces that wear over time.

2.3 Raw Water pH Sensor (pH3)

The raw-water pH sensor shall be a pH3 combination glass electrode with an integral Ag/AgCl gelled reference and an integral PT100 element for automatic temperature compensation (ATC). The pH3 is selected for raw or higher-solids source water. Key specifications:

- **Measurement range:** 0–13 pH
- **Reference / junction:** double-junction, gelled
- **Measuring surface:** flat glass face (tolerant of solids; supports in-situ flush cleaning)
- **Automatic temperature compensation:** PT100
- **Wetted materials:** PVC / glass
- **Cable:** built-in, 19.6 ft (6 m); a **Sensor Extender** shall be available where a longer cable run is required.

2.4 Settled Water pH Sensor (pH2)

The settled-water pH sensor shall be a pH2 combination glass electrode with an integral Ag/AgCl gelled reference and an integral PT100 element for automatic temperature compensation (ATC). The pH2 is selected for clarified or potable-quality process water. Key specifications:

- **Measurement range:** 0–14 pH
- **Reference / junction:** single-junction, gelled
- **Measuring surface:** standard bulb
- **Automatic temperature compensation:** PT100
- **Wetted materials:** PVC / glass

- **Cable:** built-in, 9.8 ft (3 m); a **Sensor Extender** shall be available where a longer cable run is required.

3. OPTIONAL / FUTURE-UPGRADE CAPABILITIES

The controller shall be **capable of** the following, whether or not they are enabled at initial commissioning, so that they can be activated later without replacing the analyzer:

3.1 PID Control with Flow Pacing (Compound Loop Control)

The analyzer shall have the **option (not a required function at initial commissioning)** for **Compound Loop control (PID + Flow Pacing)** for automated coagulant-feed control. Control logic shall include, at minimum:

- **PID (proportional–integral–derivative) control** with independently user-adjustable proportional, integral, and derivative terms and a user-defined control setpoint, driving either an analog (4–20 mA) or time-proportioned/pulse relay output to a chemical feed device.
- **Flow Pacing** — feed-forward pacing proportional to a plant flow signal (requires a separate flow signal input), so that dose tracks flow while the PID trims to the charge/pH setpoint.
- **Set Point Ramping** for smooth transitions during startup or setpoint changes.
- **“Start Mode”** operation triggered by a digital input for unattended transition to automatic control.

3.2 Modbus Ethernet (TCP) Communications — Read & Write

The analyzer shall have the **option (not a required function at initial commissioning)** for **Read & Write digital communication using Modbus TCP (Ethernet)** (Modbus RTU shall also be available). Write capability shall allow analyzer settings — including control parameters such as PID setpoint and tuning — to be changed remotely over the network, not read-only monitoring alone.

3.3 Automatic Sensor Auto-Clean Options

The following automated cleaning options shall be available:

Streaming Current Sensor. The sensor shall have the **option (not a required function at initial commissioning)** for an automatic **Flush** cycle (clean-water flush of the sensor) and a **Flush + Clean** cycle (flush with a metered chemical cleaning agent, e.g., dilute acid or detergent). Cycles shall be programmable on a user-set interval and/or by digital input, with user-configurable durations, and shall hold the output at the last valid value during the cycle, releasing automatically when normal reading resumes.

Raw-water pH Sensor (pH3). The raw-water pH measurement shall have the **option (not a required function at initial commissioning)** for a **Flush and Dump** flow cell: the cell isolates and flushes the electrode with clean water, dumps the accumulated solids/sample to drain, and then returns to normal sample flow. This is the preferred automated-cleaning approach for the higher-solids raw-water sample. The output shall be held during the cycle and released when normal reading resumes.

3.4 pH Sensor Sample Flow Cells

Each pH sensor shall have the option (not a required function at initial commissioning) of being mounted in its own **single-chamber standard modular flow cell** — one flow cell dedicated to the settled-water pH2 and a separate single-chamber flow cell dedicated to the raw-water pH3.

Each flow cell shall include a **flow switch** for flow indication and to trigger a low/no-flow alarm if sample flow is lost.

Each flow cell shall be available in a **vented (non-pressurized)** or a **pressurized** configuration. The vented configuration is preferred where practical, because it lets the electrode be removed easily for the frequent cleaning and calibration that pH probes require. A pressurized configuration should be specified where there is no atmospheric drain point below the flow cell (or where back-pressure would otherwise cause the cell to overflow).

4. WARRANTY

The system (analyzer and Streaming Current Sensor) shall include a two-year warranty from the date of shipment. The pH electrodes are consumable wear items and carry a separate, shorter warranty: **3 months** for the pH2 and pH3 electrodes.