INVITATION FOR BIDS
OFFICE OF PROCUREMENT SERVICES

1. INSTRUCTIONS FOR BIDDERS

a. Sealed bids will be received in the Office of Procurement Services, Mississippi State University, for the purchase of the items listed herein.

b. All bids must be received in the Office of Procurement Services on or before the bid opening time and date listed herein. Delivery of bids must be during normal working hours, 8:00 a.m. to 5:00 p.m. CST, except on weekends and holidays when no delivery is possible.

c. Bidders shall submit their bids either electronically, in Bully Buy, or in a sealed envelope. Bids CANNOT be emailed
   a. Sealed bids should include the bid number on the face of the envelope as well as the bidders' name and address. Bids should be mailed to : 245 Barr Avenue, 610 McArthur Hall, Mississippi State, MS 39762.

d. All questions regarding this bid should be directed to the Office of Procurement Services at 662-325-2550.

2. TERMS AND CONDITIONS

a. All bids should be bid "FOB Destination"

b. Bidders must comply with all rules, regulations, and statutes relating to purchasing in the State of Mississippi, in addition to the requirements on this form. General Bid Terms and Conditions can be found here: https://www.procurement.msstate.edu/procurement/bids/Bid_General_Terms_May_2019_V2.pdf

c. Any contract resulting from this Invitation for Bid shall be in substantial compliance with Mississippi State University's Standard Contract Addendum: https://www.contracts.msstate.edu/resources/standard-forms

Bid Number: MSU2026116
Opening Date: Wednesday December 9, 2026 at 2:00 p.m.
Description: Water Quantity and Water Quality Monitoring Network

Vendor Name: _____

Vendor Address: _____

Telephone Number: _____

Email Address: _____

Days the Offer is Firm: _____

Authorized Signature: _____

Name: _____

Title: _____

Item	Quantity	Description	Unit Price	Total Price
1	12	Monitoring Stations		
2	12	Area-Velocity Flow Sensors		
3	12	Automatic Water Samplers		
4	12	Monitoring Station / Sampler Interface		
5	12	Solar Power and Battery Systems		
6	12	Protective Enclosures		
7	2	Rainfall Monitoring Equipment		
8	1	Telemetry and Communications		
9	12	Cellular Service Subscription		
10	1	Data Management and Cloud-Based Software		

Item	Quantity	Description	Unit Price	Total Price
11	1	Accessories and Deployment Components		
12	1	Turnkey Installation, Startup, Calibration, And Training		

Water Quantity and Water Quality Monitoring Network

Purpose

Mississippi State University seeks sealed bids to furnish, deliver, configure, and support a complete water quantity and water quality monitoring network consisting of twelve (12) monitoring stations suitable for long-term deployment in open-channel, watershed, stream, stormwater, drainage, and environmental monitoring applications. The proposed system shall be fully operational upon delivery and shall include all equipment, software, communications, accessories, startup services, and support required for successful implementation.

New Equipment Requirement

All equipment furnished under this solicitation shall be new, unused, and of current production.

Refurbished, remanufactured, reconditioned, demonstration, previously deployed, rental, or used equipment will not be accepted.

The bidder shall certify that all proposed equipment, including monitoring stations, sensors, samplers, telemetry devices, cloud software, licenses, communication subscriptions, power systems, enclosures, cables, accessories, and related components are factory new and supplied with the manufacturer's standard warranty.

1. Monitoring Stations

Quantity: 12

Each monitoring station shall:

- Continuously monitor water level, velocity, flow rate, and related hydraulic parameters.
- Operate in partially full pipes, culverts, stormwater systems, drainage channels, streams, and open-channel applications.
- Store data internally using non-volatile memory.
- Support user-programmable logging intervals.
- Support integration with automatic water samplers.
- Support remote communication through cellular telemetry.

- Allow remote diagnostics, configuration, and data retrieval.
- Provide alarm notification capability.
- Be suitable for unattended outdoor operation.
- Support solar-powered operation.
- Be capable of near real-time data transmission.
- Support cloud-based monitoring and management systems.

2. Area-Velocity Flow Sensors

Quantity: 12

Each flow sensor shall:

- Utilize area-velocity technology.
- Measure water depth and velocity simultaneously.
- Calculate flow rate.
- Be suitable for submerged operation.
- Be compatible with open-channel and pipe flow applications.
- Include a minimum of 30 feet of cable.
- Provide continuous measurements.
- Be fully compatible with the monitoring station provided.
- Be suitable for permanent field deployment.

The bidder shall provide manufacturer-stated measurement accuracy specifications.

3. Automatic Water Samplers

Quantity: 12

Each sampler shall:

- Collect discrete and composite samples.
- Support time-paced and flow-paced sampling.
- Support event-triggered sampling.
- Operate through direct communication with the monitoring station.
- Include a minimum 10-liter sample container.
- Be suitable for outdoor environmental monitoring.
- Operate from a 12-volt DC power source.
- Be fully compatible with the monitoring network supplied.

4. Monitoring Station / Sampler Interface

Quantity: 12

Each system shall include interface hardware capable of:

- Communication between monitoring stations and automatic samplers.
- Flow-paced sampling.
- Event-triggered sampling.
- Automated sampler activation.
- User-defined triggering conditions.
- Integrated monitoring and sampling operations.

5. Solar Power and Battery Systems

Quantity: 12

Each station shall include a complete autonomous power system consisting of:

- Solar panel rated at a minimum of 50 watts.
- Solar charge controller.
- Rechargeable 40 amp hour 12-volt battery.
- Nema 3R vented Battery enclosure with back plate for meter and solar regulator mounting .
- Power cables and connectors.
- Mounting hardware.
- Battery charging and protection circuitry.
- Sufficient power capacity for continuous unattended operation.

The power system shall be designed to operate all monitoring, telemetry, and sampling functions under normal environmental conditions.

6. Protective Enclosures

Quantity: 12

Each station shall include:

- Lockable weather-resistant enclosure.
- Corrosion-resistant construction.
- Outdoor-rated enclosure equivalent to NEMA 3R or better.
- Secure mounting hardware.
- Adequate space to house monitoring equipment, communications equipment, power components, batteries, and associated wiring.

7. Rainfall Monitoring Equipment

Rainfall Data Interface

Quantity: 2

The interface shall:

- Support environmental monitoring applications.
- Support SDI-12 or equivalent communications.
- Be compatible with standard environmental sensors.
- Integrate with the proposed monitoring network.

Tipping Bucket Rain Gauge

Quantity: 2

Each rain gauge shall:

- Utilize tipping-bucket technology.
- Provide measurement resolution of 0.01 inch or finer.
- Include a minimum 50-foot communication cable.
- Be suitable for permanent outdoor installation.
- Integrate with the monitoring network.

8. Telemetry and Communications

Each monitoring station shall include:

- Cellular telemetry hardware installed inside NEMA 6 flow meter housing.
- LTE cellular communications or equivalent.
- Antenna and communication accessories.
- Remote data retrieval capability.
- Remote configuration capability.
- Remote diagnostics capability.
- Event alarms and notification capability.
- Near real-time data transmission.

The proposal shall include all hardware, activation fees, and communication services required for operation during the first year.

9. Cellular Service Subscription

Quantity: 12

- The vendor shall provide:
- One year of cellular service subscription for each station.
- Data plans sufficient for routine environmental monitoring and telemetry.
- Remote communications capability.
- Alarm and notification functionality.

- Data transmission services necessary for full system operation.

Any recurring costs beyond the first year shall be clearly identified in the proposal.

10. Data Management and Cloud-Based Software

The vendor shall provide cloud-based software capable of:

- Real-time monitoring.
- Historical data storage.
- Data visualization.
- Graphical reporting.
- Automated reporting.
- Site management.
- Remote configuration.
- Alarm management.
- User administration.
- Data sharing.
- Export in CSV and Microsoft Excel formats.

The proposal shall include all software licenses, cloud subscriptions, user access fees, and hosting fees necessary for the first year of operation.

11. Accessories and Deployment Components

The proposed system shall include all components necessary for complete deployment and operation, including but not limited to:

- Sensor mounting hardware.
- Mounting brackets.
- Communication cables.
- Power cables.
- Connectors.
- Interface cables.
- Suction tubing.
- Tubing couplers.
- Intake strainers.
- Weighted intake strainers.
- Telemetry antennas.
- Communication accessories.
- Hardware necessary for installation and operation.

No additional components shall be required for deployment other than normal field installation activities.

12. Turnkey Installation, Startup, Calibration, and Training

The vendor shall provide:

- Initial system Installation
- System configuration.
- Calibration assistance.
- Verification of proper operation.
- Operator training.
- Documentation and operational guidance.

Training shall include installation, programming, and operation of monitoring stations for a mock event, telemetry systems, data management software, samplers, and routine maintenance procedures.

Equipment Description:

The flowmeter shall be housed in a rugged, permanently sealed, submersible, watertight, dust-tight, corrosion-resistant IP68 enclosure (self-certified). The flow module shall be CE- and UKCA-marked. The flowmeter shall have the following connector ports:

a. Two self-locking quick-connect ports for Modbus devices. To connect more than two such devices, an optional Y-cable expander should be available.

b. One port for a USB communication cable with a USB B male connector.

c. One self-locking quick connect port for an SMB antenna connector.

d. One self-locking quick connect port for shared Modbus output and 28 VDC input cable connection. All electrical connections within the flow module shall be soldered or shall be pin-and-socket connections held in place by the flowmeter enclosure itself.

Power a. Nominal operating voltage shall be 12VDC. The maximum external power voltage is 28VDC. Temperature Range a. Operating and storage temperature range shall be -40 to 140°F (-40 to 60°C).

The Area Velocity Sensor will directly measure average liquid velocity using submerged ultrasonic continuous-wave Doppler technology.

The sensor will not require a multiplying factor based on flow depth to convert a point velocity to the average liquid velocity.

The sensor will directly measure liquid level using a submerged differential linear integrated circuit pressure transducer.

The sensor will transmit flow stream velocity and level data to a connected meter using Modbus proprietary protocol.

Maximum cabling length from the Signature Series Flow Meter to the sensor shall be 305 m (1,000 ft), typical.

The sensor velocity measurement range shall be -1.5 to +6.1 meters per second (-5 to +20 feet per second).

The sensor shall be capable of measuring forward and reverse flows.

The typical minimum depth for velocity measurement shall be 0.025 m (0.08 feet).

Velocity Accuracy
The velocity in water with a uniform velocity profile and a speed of sound of 1,480 meters per second (4,850 feet per second) will be measured with a maximum error of ±0.03 meters per second (±0.1 feet per second) over a range of -1.5 to +1.5 meters per second (-5 to +5 feet per second), and ±2% of reading over a range of 1.5 to 6.1 meters per second (5 to 20 feet per second).

The sensor's level measurement range shall be 0.010 to 3.05 m (0.033 to 10 ft).

Level Accuracy
Maximum non-linearity, hysteresis, and temperature error from actual liquid level shall be ±0.10% full scale over a compensated temperature range of 0 to 70°C (32 to 158°F).

The pressure transducer will be factory calibrated, with the calibration data stored as digital values in the sensor's microcontroller.

Typical long-term level stability shall be ±0.007 m/yr (±0.023 ft/yr).

1. Temperature range will be 0 to 70 °C (32 to 158 °F), for operation and storage.

Power Input

1. Input voltage range will be 7 to 14VDC.
2. Measurement current @ nominal 12VDC will 100 mA.

Sensor Construction

1. The sensor probe body will be 1.9 cm (0.75 inches) in height and 3.3 cm (1.31 inches) in width. The cable diameter is 0.9 cm (0.37 in). Cable length shall be 10 Meters.

Sensor materials exposed to the flow stream will be epoxy, stainless steel, Polycarbonate (PC), and UV-rated polyvinyl chloride (PVC).

The sensor cable will include a vent tube that will reference one side of the pressure transducer to atmospheric pressure.

The sensor cable shall be terminated with a stainless steel self-locking quick connector that is flood-proof.

Sensor Operation

1. The sensor will measure flow stream velocity using submerged continuous wave Doppler technology.

   Ultrasonic transducers inside the probe transmit ultrasonic sound waves at 500kHz, at an angle of 20° from horizontal, into the flow stream. The transducers then receive the reflected sound waves. An increase or decrease in the reflected-wave frequency indicates forward or reverse flow. A shift in frequency is proportional to flow stream velocity.

   The sensor will contain an automatic gain control amplifier that will adjust its gain based on the strength of the received Doppler signal.

2. The sensor will measure the hydrostatic pressure of the liquid depth using a submerged differential linear pressure transducer.
   a. The sensor will have automatic level correction over the full operating temperature range by way of integral digital compensation coefficients.
   b. The analog output of the pressure transducer will be converted to a digital value in the sensor, and the sensor will transmit to the flow meter a digital signal corresponding to the current level measurement.
   c. The pressure transducer is rated at 5 psi, with a maximum submersible depth of 10.55 m (34.6 ft).

INSTRUMENT

There shall be furnished an automatic sampler for aliquot collection from a variety of liquid sources. The unit shall route samples to storage containers for collection and off-site analysis. The unit shall be suitable for collecting priority pollutant or general-purpose samples in a single bottle. The unit shall be capable of either battery- or line-powered operation. The sampler shall be circular in shape with a maximum outside diameter of less than 16.5 inches (42 cm) and shall be at least 26 inches (66 cm) in height. The dry weight of the unit shall not exceed 25 pounds (11.3 kg) with a plastic bottle included. The exterior shall be light-colored ABS plastic for superior corrosion resistance and all-weather durability. All other external components shall be constructed of stainless steel, anodized aluminum, or polypropylene. This external hardware shall provide an insulation value of at least R-11. The base section shall hold at least 12 pounds of crushed ice (when using a round 1 gallon bottle) to cool the sample after collection. The base section and center section shall be a two-piece construction and include foamed-in-place insulation. The unit shall be assembled into sections for easy cleaning.

SAMPLER CONTROLLER

All electrical components shall be housed in a single controller. There shall be no external electrical or control components. The controller shall use a 2-line, 40-character display to show sampler status and program information. An 18-position keypad shall be used for all program entries and manual control of the sampler. The sampler shall provide battery-backed memory with a typical life of five years. This memory shall maintain the sampler's program settings, any stored programs and the results of the last sampling sequence when the sampler is turned off or in the event of an external power interruption. A user-initiated diagnostics routine shall determine the operational status of the sampler. The controller shall continually run internal diagnostics checks to ensure proper operation of electrical components. Any error conditions detected by the diagnostic routines shall be displayed to the user. An optional software program lock shall be provided to prevent unauthorized tampering or accidental changing of the sampler control settings.

The control box shall be constructed of 1/4" (0.64 cm) thick UV-resistant engineered thermoplastic and shall conform to NEMA 4X, 6 (IP 67) standards for water tight, dust tight, and corrosion resistance performance under submersion. A desiccator shall be used inside the control box to prevent moisture damage to electrical components.

SAMPLER PROGRAMMING

The user can program the sampler to collect single bottle composite samples at user-definable intervals. A delay to first sample collection shall be programmable in minutes from 0 to 9,999.

The sampler shall use an internal real-time clock to provide both time and date information. It shall also offer two types of sample pacing: time and flow. The sampler shall collect uniform time-paced samples at regular intervals from 1 minute to 99 hours and 59 minutes. The sampler shall accept a 12V DC flow proportional pulse or isolated dry contact closure for flow pacing. The pulse or contact closure must be at least 25 ms in length. The user shall select the number of pulses as the flow interval for each sample collection.

FAIL-SAFE SHUTOFF

The sampler shall be provided with a fail-safe shutoff mechanism. This will be a non-contacting device using the liquid detector during the purging cycles. If the sensor detects a specific amount of liquid during the purge cycle, the system identifies the bottle as full. The system will not attempt further samples to prevent overflow of the sample container.

DATA STORAGE

The sampler shall be capable of storing key information for each sampling routine. This information shall be accessible at any time during or after a sampling routine on the sampler's display. The sampling result report shall list the sample number, reason for the sample, errors that occurred, sample time, and pump revolution counts. Error codes used in the report shall be listed and defined at the end of the report. This report shall verify correct operation, indicate regulatory compliance, or be used as an enforcement document.

SAMPLE DELIVERY

PERISTALTIC PUMP

Samples shall be collected using a peristaltic pump typically producing a line velocity of 2.5 feet (0.76 m) per second in a 3/8 inch (0.95 cm) ID suction line at 3 feet (1 m) of head and capable of producing 26 feet (8 m) of lift. The peristaltic pump body shall be made of high-strength plastic for corrosion resistance and extended pump-tubing life. Before and after each sample is collected, the pump shall air purge the suction line. The system shall automatically control pre-purges and post-purges, and no pre-calibration adjustments are required. The sample stream shall be a direct tubing path from sample source to sample bottle. Samples that pass-through valves, metering chambers, or non-flexible routing tubing are not acceptable.

The sampler shall deliver repeatable sample volumes accurate to ±10 ml. The user can select sample volumes from 10 to 9,990 ml in 1-ml increments. In addition to determining sample size, the delivery system monitors anomalies in the sample collection process. If no liquid is detected, the sampler will note this in a log and record that no sample was collected for that interval.

13. Technical Support

The vendor shall provide:

- Technical support by telephone, electronic communication and on sight with 10 business days' notice
- Troubleshooting assistance.
- Software support.
- Telemetry support.
- Access to manufacturer technical resources.
- 24/7 support hours and cell phone contact for at least 2 representatives, with response procedures.

14. Maintenance and Service Options

The vendor shall identify:

- Available preventative maintenance services.
- Calibration services.
- Service visit options.
- Extended warranty options.
- Annual service agreements if available.

Pricing for optional service agreements shall be listed separately from equipment costs.

Warranty

All equipment shall include the manufacturer's standard warranty.

The proposal shall clearly identify:

- Warranty duration.
- Covered components.
- Software warranty provisions.
- Technical support coverage.
- Repair and replacement procedures.
- Equivalent Products

Equipment offered shall meet or exceed all stated specifications. If the proposed equipment does not meet the specification, the vendor shall clearly indicate the function and why it is not needed.

Bidders may propose products from any manufacturer provided the proposed equipment satisfies all functional, operational, performance, communication, software, and support requirements identified in this solicitation.

Vendor Responsibility for Complete System

The bidder shall furnish a complete and fully functional monitoring network. Any components, accessories, software licenses, subscriptions, mounting hardware, communication devices, power components, or interface equipment required for proper system operation but not explicitly listed herein shall be included in the proposal.