ADDENDUM NO. ONE

ТО

BID DOCUMENTS, CONTRACT DOCUMENTS, CONSTRUCTION SPECIFICATIONS AND DRAWINGS

FOR

FLAT CREEK WATER POLLUTION CONTROL PLANT

FOR THE

CITY OF DAWSONVILLE, GEORGIA

PROJECT NO. 182181

BID DATE: Bids Received Until 3:00 p.m. Thursday, May 15, 2025

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM BY INSERTING ITS NUMBER IN THE PROPOSAL. FAILURE TO DO SO MAY SUBJECT BONA FIDE BIDDERS TO DISQUALIFICATION. THIS ADDENDUM FORMS A PART OF THE PROJECT DOCUMENTS; IT MODIFIES THEM AS FOLLOWS:

May 2, 2025



Atlanta • 2255 Cumberland Parkway • Building 400 • Atlanta, Georgia 30339 • Tel: 770-333-0700 Augusta • 4210 Columbia Road • Building 3 • Augusta, Georgia 30907 • Tel: 706-863-8800

BID DOCUMENTS

Refer to Proposal, Pages P-6, P-7, P-8, P-9,

Replace Pages P-6, P-7, P-8, P-9 with the enclosed Pages P-6a, P-7a, P-8a, P-9a, P-10a.

Refer to Instruction to Bidders, Page IB-2a,

Revise Section 6, Item E., first bullet point to read:

"Proposal, pages P-1 through P-10a (yellow pages)"

RESPONSE TO BID QUESTIONS

1. Section 11.19 A. & 5. L is in conflict requiring a low trajectory diffuser (LTD), to reduce the misting and spray height. Drawing Sheet 35 (Aerobic Digester Sections details 1 & 2). The drawing shows fiberglass mist covers on the units. Please clarify if the intent is mist covers or low-trajectory diffuser (LTD).

Low-trajectory diffuser

2. Does this project have to conform to AIS or BABA?

No

3. 11.19 A. (2) 20HP Aerators and drawing Sheet 80 (electrical single-line diagram), conflict with drawing Sheet 62 (Process Instrumentation for the digesters), Sheet 75 (aerobic digesters) shows the units as 25HP. Please confirm the intended HP of the (2) surface aerators for the digesters.

20 hp

CONSTRUCTION DOCUMENTS

Refer to Section 11.14.F, Page 11-16,

Add the following after Section 11.14.F.2:

"3. In lieu of the above-described shafted screw, a shaftless screw is also acceptable. The grit conveyor shall be an integral part of the settling tank and shall consist of a shaftless screw mounted in a U-shaped trough constructed of 304 stainless steel. The screw shall be mounted 27 degrees from horizontal. The upper trough shall be provided with a removable cover panel. A replaceable 1/4-inch thick UHMW wear liner shall be provided along the length of the trough to prevent metal-to-metal contact between the shaftless screw and the housing. The shaftless screw shall be constructed of alloy steel with a nominal size of 3/4-inches by 2-inches deep and shall have a nominal outside diameter of 7-inches. The shaftless screw shall have a nominal length of 12-feet. A2-inch minimum diameter shaft shall be attached to the screw for connection to the drive. The screw shall have a minimum Brinell hardness of 200."

Refer to Section 11.15.A.1, Page 11-22,

Revise 11.15.A.1 to read:

"Two 75 horsepower low speed, fixed, mechanical surface aerators. Each aerator shall consist of a drive motor, gear reducer, coupling, shaft **and surface impeller**. A submerged radial pumping impeller and appurtenances, including the Velocity Enhancer poured in concrete by Contractor **shall be included if necessary per manufacturer's design**."

Refer to Section 11.15.A.7 and Section 11.15.A8, Page 11-24,

Remove Section 11.15.A.7 and Section 11.15.A.8

Refer to Section 11.15.A.9, Page 11-24,

Revise Section 11.15.A.9, second sentence of the paragraph to read:

"Manufacturer must demonstrate five US oxidation ditch installations with controls."

Refer to Section 11.15.B.11, Page 11-24

Revise Section 11.15.B.11 to read:

"Aerator Oxygen Transfer Efficiency (OTE) (lb /hp-hr): 3.50"

Refer to Section 11.15.C. Performance, Page 11-24,

Revise Section 11.15.C first sentence in the first paragraph to read:

"The surface impeller of the dual impeller aerator shall be capable of delivering an oxygen transfer efficiency of no less than **3.5** pounds O2/horsepower-hour based on motor output power at standard transfer conditions."

Remove the third and fourth sentences in the second paragraph.

Refer to Section 11.15.G. Aerator Impellers, Shafts and Couplings, Page 11-28,

Revise the first paragraph to read:

"The surface impeller shall provide oxygenation and propulsion of the mixed liquor in the oxidation ditch. If required by the manufacturer's design, a submerged radial impeller shall provide additional propulsion of the mixed liquor at the bottom portion of the oxidation ditch. The impeller assembly shall operate at a maximum output speed as recommended by the manufacturer. The surface impeller shall present a minimum amount of edge perpendicular to the flow to prevent any attachment of solid materials."

Revise the first sentence in the second paragraph to read:

"Each surface impeller shall be a rim-blade type with ten equally spaced blades or plate type with seven equally spaced blades and constructed of 1/4" minimum steel plate."

Revise the third paragraph to read:

"If a submerged radial impeller is required per the manufacturer's design, each submerged radial impeller (Deduct No. 2) shall consist of radial pumping blades and hub that shall be an integral, shop-welded unit requiring no field assembly or welding."

Refer to Section 11.15.X.2.a. Manual Mode, Page 11-36,

Revise Section 11.15.X.2.a. <u>Manual Mode</u> to read:

"VFD Speed Adjustment; EliminatIR Gate Adjustment"

Refer to Section 11.17.D.1, Filter Disk Basin, Page 11-44,

Remove the third through sixth sentences.

Refer to Section 11.17.D.5, Filter Cloth Assemblies, Page 11-45,

Revise the first sentence to read:

"Each filter shall include four (4) cloth disk assemblies."

Remove the second sentence.

Refer to Section 11.17.D.9, Pressure Transducer, Page 11-47,

Revise the last sentence to read:

"Pressure transducer shall be provided with a mounting bracket and hardware."

Refer to Section 11.17.D.10, High Level Float Switch, Page 11-47,

Revise the second sentence to read:

"The float shall contain a **non-mercury** switch, chemical resistant polypropylene casing hermetically sealed and a PVC #18 AWG three conductor cable."

Refer to Section 11.17.D.14 Control Enclosure, Page 11-48,

Revise the first sentence to read:

"The automatic controls shall be provided in a type 4X NEMA rated stainless steel wall mounted enclosure that provides insulation and protection for electrical controls and components from highly corrosive environments indoors and outdoors."

Refer to Section 11.19.A.6.a, Page 11-62,

Revise the first sentence to read:

"Each aerator shall have **1,310** lbs. reserve buoyancy to ensure stability and to provide support flotation required during aerator servicing."

Refer to Section 11.20, Submersible Pumps, Page 11-65,

	Influent Pump Station	Plant Pump Station	Return Sludge Pumps	Waste Sludge Pumps
Quantity	2	2	2	1
Discharge Size	6	4	4	4
Capacity (gpm)	1,390	700	417	278
TDH (ft)	45	51	33	39
Static Head (ft)	35	36	25	30
RPM (Max)	1,770	1,765	1,770	2,611
H.P.	25	14	5.5	5.5

Refer to Section 11.20.C. Motor, Page 11-66,

Revise the second sentence to read:

"The motor shall be NEMA Design B and designed for continuous duty with a minimum service factor of **1.15**."

Refer to Section 11.20.F. Impeller, Page 11-66,

Revise the first sentence to read:

"The impeller shall be of high chrome cast iron, (25 ATSM A-532 Alloy III A), balanced, semi-open, multi-vane, back-swept, non-clog design.

Revise the third sentence to read:

"The impeller vanes shall have screw-shaped leading edges that are hardened to Rc 60 and shall be capable of handling solids, fibrous materials and other matter found in wastewater and sludge with up to seven (7%) percent solids."

Refer to Section 12,

Replace Section 12 with the enclosed Section 12.

CONSTRUCTION DRAWINGS

Refer to Sheet 15 of 103,

Add the following to the Notes section:

"3. Provide a 10" x 6" reducer between each pump and 10" pipe."

See enclosed Revised Sheet 21 of 103.

See enclosed Revised Sheet 28 of 103.

See enclosed Revised Sheet 29 of 103.

See enclosed Revised Sheet 30 of 103.

Refer to Sheet 32 of 103, Section B-B,

Revise the ECCENTRIC REDUCER Callout to read:

"6" x 4" ECCENTRIC REDUCER (TYP. 3 PL.)"

Refer to Sheet 47 of 103, COMPOSITE SECTION,

Add the following to the Notes section:

"2. Provide a 6" x 4" reducer between each pump and 6" pipe."

Refer to Sheet 60 of 103, SCADA CONTROL PANEL LCP-1, AB 5380 PLC,

Revise AB 5380 PLC to read:

"AB **850** *PLC*"

Revise Note 6 to read:

"HMI software shall be VT SCADA."

Refer to Sheet 62 of 103.

Revise the Aerobic Digester, Digester Aerator #1A information to read:

"Digester Aerator #1A 20 HP, 460 VAC, 3PH"

Revise the Aerobic Digester, Digester Aerator #1B information to read:

"Digester Aerator #1B 20 HP, 460 VAC, 3PH"

Refer to Sheet 75 of 103.

Revise the <u>Aerobic Digester- Electrical</u>, Digester Aerator #1A to read:

"Digester Aerator #1A **20** *HP*, 460 *V*, 3Ø" Revise the <u>Aerobic Digester- Electrical</u>, Digester Aerator #1B to read:

"Digester Aerator #1B 20 HP, 460 V, 3Ø"

See enclosed revised Sheet 91 of 103.

END OF ADDENDUM NO. ONE

D-3

To replace the tertiary filters specified with the alternate Kruger Model HSF2212/6-2C. Bid amount shall include the cost of all

required modifications and any additional engineering design and **D-4** review required. Any additional changes shall be made at no additional cost to Owner.

CITY OF DAWSONVILLE, GEORGIA FLAT CREEK WATER POLLUTION CONTROL PLANT

TOTAL AMOUNT BID, ITEMS 1 THROUGH 11, INCLUSIVE, THE AMOUNT OF:

The Owner reserves the right to add any or all of the following deductions of the work for the purpose of making Note: contract award. Award of the contract may be with one or more of these items. Each bidder must fill in the unit price amount for each item below. \$ D-1 To delete the brick entrance sign, delete the following amount: To delete the Excell velocity enhancer as described in Section D-2 10.15.G.5 of these Specifications, including the velocity enhancer \$ concrete wall, delete the following amount: To construct the asphalt access road with 8" graded aggregate ¢ base in lieu of asphalt, deduct the following amount:

(\$

)

DOLLARS

DEDUCTIONS

SUBSTITUTE EQUIPMENT

The Bidder may offer at his own option the bid price and name of other makes of equipment which he desires to substitute for specified equipment designated by him in the Proposal. The Bidder is referred to Section 11.03 of these specifications for "Substitute Equipment" required.

Item	Equipment & Manufacturer	Price	Base Price
			\$
	Mfr	\$	_
			\$
	Mfr	\$	_
			\$
	Mfr	\$	_
			\$
	Mfr	\$	_
			\$
	Mfr	\$	_
			\$
	Mfr	\$	_
			\$
	Mfr	\$	_

The Bidder further proposes and agrees hereby to commence work under this Contract, with adequate force and equipment, on a date to be specified in a written order of the Engineer and shall fully complete all work thereunder as set forth in the Contract Agreement.

The Bidder further proposes and agrees to construct all work under lump sum items of the Proposal for the lump sum price bid, and understands that certain quantities as listed under Extra Work If Ordered By Engineer will be used in case of minor authorized increase or decrease in quantities to adjust by direct increase or decrease the lump sum bid for the complete work.

The Bidder declares that he understands that the unit price quantities shown in the Proposal are subject to adjustment by either increase or decrease, and that should quantities of any of the items of the work be increased, the undersigned proposes to do the additional work at the unit prices stated herein; and should the quantities be decreased, he also understands that payment will be made on actual quantities at the unit price bid and will make no claim for anticipated profits for any decrease in the quantities and that quantities will be determined upon completion of the work at which time adjustment will be made to the contract amount by direct increase or decrease.

The undersigned further agrees that, in case of failure on his part to execute the said Contract and the Bond within 10 consecutive calendar days after written notice being given of the award of the Contract, the check or bid bond accompanying this bid and the monies payable thereto, shall be paid into the funds of the Owner as liquidated damages for such failure otherwise, the check or bid bond accompanying this Proposal shall be returned to the undersigned.

Attached hereto is a certified check on the				Bank	of	
					_, or a Bid Bond I	by the
					in the amou	int of
]	Dollars (<u>\$</u>) made pa	iyable
to the CITY OI	F DAWSON	VILLE, GEO	RGIA in a	ccordance wit	th the conditions of	of the
advertisement and	d provisions h	erein.				
BIDDER A	ACKNOWLI	EDGES RECI	EIPT OF TH	IE FOLLOW	ING ADDENDA	
No	Date		No.		Date	
No	Date		No		Date	
		Submitted E	By:			
		Georgia Uti	lity Contract	or License No)	
		By:				L.S.
		Title:				
Address:						
Telephone No				Fax No.		

(Note: If the Bidder is a Corporation, the Proposal shall be signed by an officer of the Corporation; if a Partnership, it shall be signed by a Partner. If signed by others, authority for signature shall be attached.)

The full names and residences of persons and firms interested in the foregoing bid, as principal, are as follows:

EXPERIENCE AND REFERENCES

The bidder shall here state what work he has done of similar nature to that bid for, and give references that will afford the Owner opportunity to judge as to experience, skill, business standing and financial ability.

SECTION 12 INSTRUMENTATION AND CONTROL

- 12.01 <u>Scope</u>: The Contractor shall furnish all materials, labor and equipment necessary for the complete installation of instrumentation and control systems as shown on the Drawings and/or specified and the furnishing of the installation and initial operation shall be a minimum of one working day.
 - A. The Contractor shall furnish, install, test, adjust and paint in accurate, satisfactory, workmanlike manner, all machinery, equipment, apparatus, accessories, and fittings required by the completion of the work in accord with the Drawings, this Section, other pertinent sections, and in accord with the drawings, specifications and directions for erection furnished by each equipment manufacturer.
 - B. The Contractor shall furnish and install all materials including electric wiring, conduits, and controls not furnished by the equipment manufacturers. The Contractor's attention is directed to the General Requirements with reference to requirements for furnishing working drawings.
- 12.02 <u>General</u>: All requirements concerning supervisory services, equipment bids, equipment obtained from manufacturer, equipment reviewed, mechanical testing, piping for equipment, shop painting, operation and maintenance manuals, guarantees, and motors specified in Section 11.02 through Section 11.12 shall apply to this Section of the Specification unless otherwise specified.
- 12.03 <u>Standards</u>: All work shall conform to applicable standards of ANSI, IEEE, ISA, NEMA, UL, and NEC.
- 12.04 <u>Submittals</u>: Complete shop drawings showing the panel outline dimensions, instruments, and control configurations, wiring schematics, field termination types of devices, block diagrams, bill of materials and description of operation for review prior to fabrication.
- 12.05 <u>Qualifications</u>: Attention is directed to the fact that instrumentation is an integrated system; as such, shall be furnished by a single system vendor, who shall provide all of the equipment and appurtenances, regardless of manufacture, and be responsible for the satisfactory operation of the entire system.
 - A. Instruments and instrumentation shall be furnished by J.K. Duren Co., MR Systems or approved equal.
- 12.06 <u>Parshall Flume Liner (FEI)</u>: Two (2) flumes shall be developed by installation of a full length Parshall Flume liner into the structure as indicated on the drawings. The liners shall be fabricated in one piece from polyester resin reinforced with not less than 30 percent fiberglass by weight. Locking devices for engagement with the grout around the liner and reinforcing ribs shall be an integral part of the liner. Removable bracing shall be provided to insure proper maintenance of liner dimensions during shipment and installation. The wall thickness of the liner shall be not less than 1/4 inch. The flume waterway dimensions shall conform to the U.S. Department of Agriculture, Soil Conservation Circular No. 843, latest edition. The liner shall be furnished with a staff gauge molded in the side of the flume.

12.07 <u>Ultra-Sonic Flowmeters</u>:

- A. <u>General</u>: Two (2) ultrasonic flowmeters shall be installed to measure (flow) in the Parshall flume at the locations shown on the plans in accordance with the manufacturer's recommendations. The flowmeters shall have microprocessorbased electronics, a front panel menu driven keyboard and shall produce an isolated 4-20 ma DC signal proportional to the flow, over a measurement range of 0 to 10 mgd. The flowmeters shall be self-compensation for ambient temperature conditions. The flowmeters shall also have as standard, four relay outputs available for alarm conditions, sampling or pulsing external totalizers. The unit shall be capable of simulating flow without any external devices for verifying outputs and calibrations. The unit shall be a Control Electronics, Teledyne ISCO or approved equal.
- B. <u>Acoustic and Mounting Equipment</u>: Two (2) acoustic sensors shall be permanently mounted at the measuring site and positioned according to the manufacturer's approved method. Sensor mounting adaptors shall be supplied by the manufacturer. The sensors shall transmit and receive and acoustic signal to accurately measure fluid depth at the monitoring site. The sensors shall have built-in temperature compensation to maintain accuracy. The transmitted beam angle shall not be greater than three degrees. The sensors shall be capable of an indefinite submergence of thirty (30') feet without degradation. The sensor shall function over an ambient temperature of 20° F to 160° F.
- C. <u>Flow Indicating Transmitter</u>: Two (2) transmitters shall contain all necessary circuitry to utilize the signal from the acoustic sensor, area flow meter and shall produce an accurate 4-20 maDA signal. An RS-232 serial port connection shall be provided for computer interface for real-time communications. The transmitters shall be supplied with an LCD indicator to display flow rate and flow total and their respective flow units and multipliers. The display shall indicate if there is a fault or an alarm condition. The transmitter shall also produce four relay output connections for external alarms, sampling or pulse output to drive a remote Flow Indication/Totalizer.

It shall be mounted in a NEMA-4X fiberglass enclosure with see through acrylic door. Surge protection shall be provided for the 120 VAC and the 4 to 20 mA output.

D. <u>Operating Parameters</u>: Accuracy of the unit shall be unaffected by temperature changes within the specified ambient temperature range. Flow sampling shall be a minimum of 15 samples per second and the unit shall be able to operate with as few as two (2%) percent of the samples taken successfully. In the event of the prolonged loss of acoustic signal, the unit shall indicate the condition by a flashing status indication on the front display panel. The flow signal shall be an isolated 4-20 maDC operating into a maximum of 1000 ohms. The accuracy shall be $\pm 0.1\%$ of target distance or $\pm .08$ ", whichever is greater. Repeatability shall be within $\pm 0.2\%$. The unit shall operate using 117 VAC, 60 Hz electrical service. Power consumption shall be less than 10 watts indoor/210 watts outdoor. All user wiring connections shall be made via well-marked terminal blocks.

- E. <u>Transducer Cable</u>: The electrical signaling cable, supplied by the flowmeter manufacturer, shall be connected from the sensor to the transmitter housing. The cable shall be installed in an exclusive 3/4" to 1" rigid or flexible, continuous, watertight, metallic conduit.
- F. <u>Service</u>: It shall be the responsibility of the manufacturer of the flowmeter to have a trained representative place the equipment in operation, demonstrate the operation to the owner and/or the Engineers and train the owner's personnel in the proper use of the equipment.

There shall be furnished an electromagnetic flow meter suitable for fixed-site measurement of bi-directional flow in a full pipe. The flow meter shall consist of a flow tube and a flow transmitter, which shall indicate, totalize and transmit flow. The flow tubes shall use a spool piece configuration with field-interchangeable sensors containing coils and electrodes.

- G. <u>Spool Piece Flow Tube and Sensors</u>:
 - 1. The nominal diameter of the flow tubes shall be 6-inches.
 - 2. The spool piece flow tube shall be made of carbon steel and shall be a fusion bonded polyethylene finish inside and outside. O ring seals shall be made of Viton, and standpipe gaskets shall be made of nitrile rubber.
 - a. The flow tube shall not require an insulating liner. The flow tube liner shall be polyethylene that conforms to National Sanitation Foundation Standard 61 for use with potable water. Accuracy shall be not be affected by cuts or scratches in the flow tube liner.
 - b. The flow tube shall be supplied with raised face carbon steel flanges to ANSI 150rf Table D.
 - 3. Each flow sensor shall contain a coil, a pair of sensing electrodes, and an integral grounding electrode. External grounding rings and straps shall not be necessary. The sensors shall use solid state design, with the coils, electrodes, and other sensor components encapsulated in polyurethane that conforms to National Sanitation Foundation Standard 61 for use with potable water for nominal diameters of 16 in. (400 mm) and above]. The sensors shall be field-replaceable and field-interchangeable without the need for recalibration.
 - a. The electrodes shall be made of Type 316 stainless steel.
 - b. The flow tube shall use unipolar pulsed AC electromagnetic excitation, with typical magnetizing current of not less than 1A base to peak, and frequency of not less than 2/3 of power supply frequency (40 Hz for a 60 Hz power supply frequency), to ensure a high signal-to-media noise ration.
 - 4. The minimum media conductivity shall be 0.5 microS/cm.
 - 5. The maximum media temperature shall be 175 degrees F (80 degrees C).

- 6. The flow meter shall include multiple sensors to measure mean velocity in full pipes.
 - a. The mean velocity measurement range shall be from 0 to 2 feet per second (0 to 0.6 meters per second) to 0 to 50 feet per second (0 to 15 meters per second).
 - b. The minimum detectable mean velocity shall be 0.02 feet per second (0.006 meters per second).
 - c. The mean velocity shall be measured with a maximum error of +/-0.005 feet per second (+/- 0.0015 meters per second) over a range of less than 1 foot per second (0.3 meters per second), and +/-0.5% of flow rate over a range of 1 to 50 feet per second (0.3 to 15 meters per second). A mean velocity of 0.1 foot per second (0.03 meters per second) shall be measured with a maximum error of +/-5% of reading. Accuracy shall be traceable to the US National Institute of Standards and Technology (NIST), and shall be guaranteed on-site for applications such as drinking water, raw sewage, and similar media, even with a permanent coating of raw sewage or similar on the electrodes, provided that specification parameters and installation recommendations are met. A NIST traceable calibration certificate shall be provided with each flow meter.
 - d. The temperature coefficient shall be less than 0.05% per 10° F (0.09% per 10° C).
 - e. A non-full pipe condition shall be indicated by a user-supplied signal into one of the contact inputs on the flow transmitter.
 - f. Maximum pressure shall be 150 psi (10 bar).
- 7. The wiring from the flow transmitter to the sensors shall be two (2) separate 2-conductor cables, 18 gauge (0.75 mm2), twisted and shielded. The wiring from the flow transmitter to the sensors shall be 33 feet long.
- 8. The flow tube and sensors shall exceed the NEMA 6P (IP68) submersibility standard and shall be submersible to 33 feet (10m).
- 9. The flow tube shall have a 10-year warranty and the sensors a 5-year warranty.
- 10. The flow tube assembly shall be certified to conform with UL and CSA standards for use in ordinary locations and in Class 1 Division 2 explosive areas with the transmitter to be located in the safe area.
- H. <u>Flow Transmitter</u>:
 - 1. The flow transmitter shall be microprocessor-based, and shall contain a keypad and a 2 line, 32 character, backlit alphanumeric liquid crystal display (LCD) with characters 0.3 inches (8 mm) high and 0.2 inches (5 mm) wide. The LCD shall visually prompt the user through the

programming sequence, and the flow transmitter shall include a built-in help system. The LCD shall display flow rate and/or total flow in userselectable units of measure. The flow transmitter shall be capable of displaying forward, reverse, net and grand total flows, and the totalizers shall be resettable or non-resettable.

- 2. The flow transmitter shall have an input impedance of 10^{12} ohms.
- 3. The flow transmitter shall include 2 isolated contact inputs, activated by contact closure or transistor, programmable to acknowledge alarms, reset totalizers, select the current flow rate range in forward flow/multi range mode, or indicate non-full pipe condition, rated 25 volts DC, 15 mA.
- 4. The flow transmitter shall include an isolated, internally powered 4 to 20 mA output into a maximum of 500 ohms. The 4 to 20 mA output shall be programmable to operate in either forward flow rate, forward flow rate/multi range, bidirectional flow rate or bidirectional flow rate/split range mode.
 - a. In forward flow rate mode, 4 mA shall represent zero flow rate, and 20 mA shall represent the programmable maximum forward flow rate.
 - b. In forward flow rate/multi range mode, up to 3 different flow rate ranges shall be programmable with the current range selected by user-supplied signals applied to the contact inputs.
 - c. In bidirectional flow rate mode, independent maximum forward and reverse flow rates shall be programmable, with flow direction indicated by a relay output.
 - d. In bidirectional flow rate/split range mode, 4 mA shall represent the programmable maximum reverse flow rate, 12 mA shall represent zero flow rate, and 20 mA shall represent the programmable maximum forward flow rate.
- 5. The flow transmitter shall include a 2 wire solid state pulse output, internally powered, rated 25 volts DC, 80 mA. The pulse output shall be programmable to operate in either scaled or frequency mode.
 - a. Scaled mode shall be used for totalizing with a programmable maximum frequency of 5, 10 or 100 Hz and a corresponding pulse width of 100, 50 or 5 ms, respectively.
 - b. Frequency mode shall be used for rate indication, with a square wave output programmable from 0 to 1,000 Hz to 0 to 10,000 Hz.
- 6. The flow transmitter shall include 2 isolated, normally open relay contacts, activated based on reverse flow, high or low flow rate, total flow, or diagnostic errors, rated 60 volts DC, 30 volts AC RMS, 3 A resistive.
- 7. The flow transmitter shall be Factory Mutual (FM), reviewed for use in ordinary locations.

- 8. The flow transmitter shall operate on 120 VAC, 50/60 Hz, line power. Typical power consumption shall be 10 W, including the sensors.
- 9. The flow transmitter shall be housed in a rugged, watertight, dust-tight, corrosion resistant (NEMA 4X and IP65) cast aluminum, epoxy painted enclosure suitable for conduit connections. The enclosure shall include a polycarbonate window for viewing the LCD without opening the enclosure.
- 10. The flow transmitter shall have a 2-year warranty.
- 12.08 <u>Float Switch</u>: Provide one (1) float switch to be installed as high level alarm in the aerobic digester. Float switch shall be Anchor Scientific Model 540 NO-NC, Pentair or approved equal
- 12.09 Automatic Samplers:
 - A. The Contractor shall furnish and install as shown and specified two (2) refrigerated automatic samplers.
 - 1. Each refrigerated sampler shall be engineered for outstanding corrosion resistance and be suitable for use over a wide range of sampling applications. A corrosion resistant fiberglass body and temperature control system shall allow the refrigerated sampler to be used outdoors without an enclosure in ambient temperatures from -20° to 120° F (-29° to 49° C).
 - 2. The refrigerated sampler shall be equally suitable for sequential and composite sampling applications. In sequential applications, the sampler shall be capable of collecting discrete samples in 24, 8 or 2 sample bottles. The sampler shall be provided with two 2.0 gallon polyethylene bottles. The 8 or 24 bottle versions shall hold the bottles in a corrosion resistant nylon coated slide-in rack. For composite applications, the sampler shall be capable of being converted to use a single 2 ½ gallon glass or polyethylene lined screw caps.
 - 3. The collected sample shall be stored in a refrigerated enclosure capable of maintaining a sample temperature of $39\pm 1.8^{\circ}$ F ($4\pm 1^{\circ}$ C) in ambient temperatures from -20° to 120° F (-29° to 49° C).
 - 4. The refrigerator shall include long life electronic sensing devices for measuring ambient air temperature, evaporator plate temperature and interior air temperature. Built-in temperature control circuitry these sensors to control the operation of the compressor and built in heaters. The built in heaters shall be used to prevent the sample from freezing if the ambient air temperature drops below freezing. The unit shall be self-defrosting and shall use a forced air condensing coil with filtered frontal ventilation. A compressor with a minimum rating of 1/6 HP shall be used. The refrigerator shall have a 5 minute typical recovery time to return to 39° F (4° C) after the door has been opened for 1 minute with the unit operating at 39° F (4° C).

- 5. The exterior and base of the refrigerator shall be constructed of fiberglass reinforced plastic a UV resistant gel-coat. The interior of the refrigerator shall be food grade ABS plastic for easy cleaning and to inhibit bacterial growth. The copper refrigeration lines shall be protected with polyester tubing and phenolic resin. The condenser coil shall be powder coated with UV resistant polyurethane for added corrosion resistance. The refrigerator evaporator plate shall be aluminum and powder coated with a food grade epoxy to resist corrosion. The refrigerator shall include have a hinged, reinforced fiberglass controller cover which is capable of being locked. The temperature control knob shall be located under this cover. The refrigerator's door shall also have hasps capable of accepting a padlock to prevent unauthorized tampering with the sample compartment contents. A magnetic gasket shall be used to seal the refrigerator door. The refrigerator power supply and solid state thermostat shall be contained in a sealed, NEMA 4 equivalent, aluminum enclosure inside the refrigerator base.
- 6. All other exposed metal components shall be either anodized or irradiated aluminum, stainless steel or galvanized steel.
- 7. For multiple bottle sampling, the sample distribution system shall use a Geneva mechanism to lock the distributor arm above each bottle position for accurate sample delivery. The distributor arm shall be made of polypropylene to resist corrosion. The distribution drive assembly shall be included in a sealed NEMA 4X, 6 controller to prevent exposure of the electromechanical components.
- 8. Samples shall be collected using a peristaltic pump typically producing a line velocity of 5.1 feet per second in a 1/4 inch ID suction line at three feet of head height. The body of the peristaltic pump shall be made of high strength plastic for corrosion resistance and extended pump tubing life. The pump shall be capable of producing 26 feet of lift. A settable indicator shall count the pump revolutions and warn the user when it is time to replace the pump tubing to prevent missed samples due to broken tubing. Before and after each sample is collected, the pump shall air purge the suction line. Pre-purges and post-purges shall be automatically controlled, and no precalibration adjustments shall be required. The sample stream shall not pass through any valves or metering chambers or through any distribution tubing unless under pumped flow. The materials in contract with the flow stream shall be limited to medical grade silicone rubber, vinyl or Teflon and stainless steel. The suction line shall be made of 3/8 inch ID vinyl with a length of 25 feet. An optional weighted polyproplene strainer with a streamlined polypropylene debris deflector to prevent clogging shall be supplied.
- 9. The sampler shall utilize a non-wetted, non-conductive detector to sense the presence of the liquid at the inlet to the pump. The sensor shall not be dependent on or affected by any compositional, chemical or physical property of the liquid, including high or low conductively of the sample.

The liquid detector shall eliminate entering the head height in programming and shall minimize the effects of changing head, intermittent flow in the suction, or variable battery conditions on sample volume. Once the liquid has been detected at the pump inlet, the sampler shall deliver repeatable and accurate sample volumes regardless of battery condition by counting the revolutions of the peristaltic pump. The sampler shall deliver repeatable sample volumes typically within ± 10 ml to prevent any single sample from biasing the collected sample.

- 10. The sampling program shall be established using a 24-position sealed keypad and a 2 line, 40 character liquid crystal display. The display shall continuously communicate the sampler's status. Two programming modes, "basic" and "extended", shall be provided. The extended programming mode shall expand the versatility of the sampler by providing options to allow the user to create complex sampling routines. The sampler shall have software capable of storing up to three sampling routines identified by number. The sampler shall contain an internal lithium battery which provides the sampler with continuous memory. The battery shall have a minimum typical life of 5 years and shall maintain the sampler's program settings and any stored programs when the sampler is turned off or in the event of an external power interruption. The keypad shall allow the user to select the sampler display to appear in German, French, Spanish or English languages.
- 11. The basic and extended modes shall allow the user to program the sampler to collect either sequential or composite samples at user-definable time intervals (time pacing) or at equal flow volume intervals based on flow pulse inputs from an external flow meter (flow pacing). The flow intervals shall be selectable from 1 to 9,999 flow pulses. The sampler shall use an internal real-time clock to provide both time and date information. It shall also offer two types of time pacing: uniform and nonuniform. Uniform time paced samples shall be collected at regular time intervals from 1 minute to 99 hours and 59 minutes. Non-uniform time intervals from 1 to 999 minutes between samples or, based on real time settings, shall be capable of being programmed. Non-uniform time shall be common to both sequential and composite sampling routines. A delay to first sample shall be programmable in minutes from 0 to 9,999 or by the real time clock. The sampler shall have the ability to be programmed for up to 24 real time sampling stop/resume times to allow unattended sampling of shift related discharges. A software program lock shall be provided to prevent unauthorized tampering or accidental changing of the sampler control settings.
- 12. The sampler software shall provide manually initiated diagnostic routines to evaluate the operational status of the sampler. The sampler shall alert the user to a low battery condition. The sample volume shall be programmed from the keypad from 10 to 9990 ml in 1 ml increments.

- 13. The sampler program shall allow the user to select from three (3) types of multiplexing: samples per bottle, bottles per sample and multiple bottle compositing (a combination of samples per bottle and bottles per sample). Multiple bottle compositing shall allow the user to place many samples in a single bottle while simultaneously creating a duplicate bottle or set of bottles. The sampler shall switch bottles after a period of time has elapsed or a predetermined number of samples have been collected. The controller shall be programmable for up to three sample collection retries if liquid is not detected due to suction line plugging or absence of liquid. Up to three suction line rinse cycles shall be programmable to precondition the suction line before each sample to prevent contamination from the previous sample.
- 14. In extended programming mode, a third type of sampling pacing known as STORM pacing shall be provided. This STORM pacing provides for both time and flow paced samples to be collected in separate bottles sets during a single program. The sample volumes for the time sampling shall be independently programmed. The program shall allow the user to select whether the flow sampling occurs during the time sampling or after the time sampling is complete. This program shall allow the user to independently select bottles per sample, samples per bottle or multiple bottle compositing during the time or flow paced program segments. The STORM program shall provide for sampler shutoff if the flow paced samples so not occur before a programmed maximum flow interval to prevent samples from multiple storms from being mixed.
- 15. The sampler shall be capable of storing key information for each sampling routine such as start time, halt and resume times, the time each sample was collected and cause of any missed samples. This information shall be accessible at any time during or after a sampling routine before the next routine has started. The sample shall also create and store two types of reports–a program settings report and a sampling results report. These reports can be accessed with the field printer or the personal computer software listed in the options below.
- 16. The sampling results report shall list the sample number, bottle number where the sample was placed, reason the sample was initiated, any errors which occurred, time the sample was taken including date, and the pump revolution counts which occurred. Any error codes used in the report shall be listed and defined in a key listing at the end of the report. This report shall be able to be used to verify correct operation, indicate regulatory compliance or used as an enforcement document.
- 17. The program settings report shall allow the sampler programming to be verified before of and after sampling. This report shall include the sampling mode, enable time or mode, delay to first sample and the intervals between samples and other programmed parameters.

- 18. All mechanical and electronic components shall be housed in a watertight control box mounted on top of the refrigerated section. The controller shall be made of at least 1/4 inch thick Noryl plastic and shall conform to NEMA 4X standards for watertight, dust-tight and corrosion. The controller shall also be protected from accidental submersion under 6 feet of water for 30 minutes (NEMA 6 self-certified). The distribution assembly shall be enclosed inside this NEMA 4X, 6 controller enclosure. A desiccator shall be installed in the control box to prevent moisture damage to the components. The sealed control box shall be removable to allow use on either a portable or refrigerated sampler.
- 19. This sampler shall operate on 120 volt AC, 60 Hz. Two spare 2.0 gallon bottles to be provided. Sampler shall be an ISCO Model 4700 FR or Sigma Model SD900 or approved equal. Equivalent samplers manufactured by ISCO, American Sigma or approved equal can be furnished.
- 12.10 Computer and Human Machine Interface:

1.

- A. The existing Telemetry Monitoring and Control System data shall be transmitted to the new WPCS Plant computer and displayed in HMI.
- B. <u>Telemetry Equipment</u>: The base station and remote RTU's shall be as specified herein:

- Base Station – City of Dawsonvil	le WPCP
AI1	Effluent Flow
	Alarms on High/Low flow
	Totalization of flow
	Instantaneous flow rate
AI2 thru 5 Aerators	VFD Speed
DI1 thru 3 Pump Station Level	Alarms on high/low level.
DI4 thru 7	Aerator Fault
DI8 thru 9	Clarifer Fault
DI10	Filter Fault
DI11 thru 12	U.V. System Fault
DI13	Bar Screen Fault
DI14	Grit Separator Fault
DI15 thru 18	Spare
DO1 thru DO8	
	<u>- Base Station – City of Dawsonvil</u> AI1 AI2 thru 5 Aerators DI1 thru 3 Pump Station Level DI4 thru 7 DI8 thru 9 DI10 DI11 thru 12 DI13 DI14 DI15 thru 18 DO1 thru DO8

C. <u>System Control Hardware and Software</u>: System Computer, Peripherals and Options are as follows:

- 1. <u>System Hardware</u>:
 - a. PC Core i7-2600K 3.4GHz Computer
 - 1) RAM: 16 GB
 - 2) Drives: 8.0 GB HD, DVD R
 - 3) Graphics: 1 GB DDR3
 - b. Color Monitor, LCD w/LED Back Light, 1920x1080, 10,000,000:1 ratio
 - c. Keyboard, 101 Key, AT compatible, two-button mouse
 - d. Printer, Inkjet 1440 x 720 dpi resolution
 - e. UPS, 850 watt, 2ms transfer, 20 minutes full load with tele. Surge arrestor
 - f. MS Windows 11 Professional
 - g. Application software for report generation
- 2. <u>System Operational Software</u>:
 - a. The system operational software software package shall be graphics based, mouse operated, multi-tasking under Windows. Software shall be runtime versions of VT SCADA latest version, no substitution will be permitted, required to match existing system. Software point allowance shall allow for the addition of up to fifty additional water and waste water sites without additional keys for points.
 - b. The operational software shall contain the system fully automatic control algorithm as defined by the Owner and include communications traffic control. Communications traffic shall be controlled by polling by exception, user defined timed update polling, and operator polling of one, groups, or all remote sites. The software shall present a system overview map screen with hot buttons, summary screens for tanks and a detail screen for each remote site depicting all variables, controls and set points. On line trending of all system variables shall be presented as a function of user defined times including hour, day, week, month, or year.
 - c. All significant variables of interest to the Owner shall be archived in DBF file to format for future use by the Owner in supplementary data base on spreadsheet programs.
 - d. Alarms presented by RTU's or the system control algorithm shall be presented on screen, printed and passed to the base modem for distribution to optional synthesized voice telephone or radio dialers.

- e. Graphics displays shall be capable of video strip chart recorder images of tank histories eliminating the need for pen type recorders and paper charts.
- f. The system handler module shall serve as the system protocol converter and be capable of unit conversion, store and forward repeater route definition and be able to process variable length data packets as an extension of the system's functionality and flexibility. The handler shall be capable of cyclic redundancy checking and contain noise filters for inbound packets.

3. <u>System Reporting Software:</u>

- a. The system reporting software shall be coordinated with the system files to provide automatic and operator reports of the system variables. Automatic period reports shall be generated for year, month, and day. Operator period reports shall be generated for year to last month, month to last day, and day to last hour poll. Period reports shall express the system variables in the form of accumulated count or averages for the period. Operator instantaneous values reports shall be implemented by polling the system to update the system status then generating the report. The report shall present the system variables in the form of instantaneous status such and on/off, fail, alarm, rate value or level value.
- b. The Supplier shall have the capability to offer customized reports which manipulate the data from the system, or a reporting module which allows operator to generate custom reports based on the information input into the system.

4. <u>Alarm notification Software:</u>

- a. The Alarm Notification System shall support alarm notification via dial-out over voice modem (using text-to-speech), VOIP (voice over Internet protocol), an Internet service such as Twilio®, SMS text message, email and alphanumeric pager. Alarm acknowledgement shall be supported during voice calls and via email and text message.
- b. The Alarm Notification System shall allow status retrieval and alarm acknowledgement via dial-in over voice modem (using text-to-speech.)
- c. The Alarm Notification System shall be an integrated feature of the SCADA systems and shall not require a separate tag database and security system.
- d. Email messages shall support outgoing mail with transport layer security (e.g. Gmail, Yahoo Mail, or corporate email server.)

- e. The Alarm Notification System shall be capable of annunciating alarms to rosters of users with up to 39 contacts per roster. An unlimited number of rosters shall be supported. The system shall support associating rosters with functional areas, such that alarms in these functional areas will activate notification to the appropriate contacts.
- f. The Alarm Notification System shall allow the configuration of delays between, and repeats of, any individual contact or group of contacts in a contact list.
- g. Security rights to edit a roster shall be controlled by a dedicated privilege, not dependent on any other tag-modification privileges.
- h. System shall support an API allowing user-defined views of roster contact lists.
- i. System shall support a means of disabling or enabling a contact in a roster without needing to open or edit the contact list.
- 12.11 <u>Payment</u>: No separate payment will be made for the work of this Section. The cost of the work and all costs incidental thereto, shall be included in the amount bid in the Proposal for the item to which the work pertains.