



Department of Purchasing and Contracting

INSTRUCTIONS FOR NON-COMPETITIVE PURCHASE REQUESTS

The Competitive Bidding Process is the preferred method of purchasing good or services. A waiver of this process must be requested on a case by case basis by completing a Non-Competitive Purchase Request Form in its entirety.

The form must be signed by Department Director of the User Department and submitted to the Director of the Department of Purchasing and Contracting by attachment to the requisition in Oracle.

Justification for the waiver must be provided on the request form. Additional pages may be attached if necessary.

Non-Competitive Purchase Requisitions must have a market/price reasonableness determination.

Emergency Purchase Request

An Emergency Purchase Request is to be used when a User Department seeks goods or services due to an unexpected and urgent request where health and safety or the conservation of public resources is at risk. The request must be completed regardless of the time of the emergency occurrence or dollar amount of the requisition, and must include an explanation as to why the emergency cannot be responded to using the competitive process. Expiration of funds, administrative delay or expiration of a contract or quote is not acceptable criteria for an Emergency Non-Competitive Purchase.

An emergency procurement is handled outside of the normal competitive process because of the urgency of the circumstances. **Poor planning or the pending expiration of funds does not constitute a valid justification for an emergency purchase.**

Sole Source Purchase Request

A Sole Source Purchase Request is to be used when a User Department seeks goods or services from the only qualified vendor or supplier that possesses the unique ability or available capacity to provide the requested goods or services. A vendor may be a sole source when the procurement involves proprietary technology, copyright, or patented information, goods or services. Additional justification for a Sole Source Purchase Request may include the requirement to match piece of existing equipment available only from the same source of original equipment or authorized dealer or an upgrade to existing software only available from the producer of the software;

A Sole Source Public Notice Form shall be posted on the County's website for five (5) business days and the results shall be attached to this Sole Source Purchase Request.



Department of Purchasing and Contracting NON-COMPETITIVE PROCUREMENT REQUEST FORM

Requesting Department: Department of Watershed Management
Department Contact Person: Tidarat Strickland Telephone: 404-218-5768
Email: tstrickland@dekalbcountyga.gov

Requisition Number: _____ Suggested Supplier: Kovalus Separation Solut
Estimated Amount of Purchase: \$ 550,000.00
Detailed Description of the Goods or Services to be purchased: Initial downpayment to purchase membranes to buildout Snapfinger AWTF (SFAWTF) membrane clusters 1-4.

Emergency (For Emergency Requests, Please check this box and answer **all** questions below.)

1. Date and Time of Emergency Occurrence: 1/30/2026

2. Please state the nature of the emergency posing a risk to public health, welfare, safety or resources:

Buildout of membranes in membrane clusters 1-4 are needed for SFAWTF to reliably treat Phase 2 plant design flows to mitigate risk (sewer spills) associated with non-compliance with Consent Decree commitments and non-compliance with the plant's NPDES (discharge) permit.

3. State how the Estimated Amount was determined to be Fair and Reasonable (attach supporting documentation):

Design engineer compared cost to quotes from other membrane manufacturers. See attached.

Sole Source (Please check box and answer all of the following completely.)

1. Provide an explanation why the product, service or supplier requested is the only method that can satisfy the requirements. Please explain why alternatives are unacceptable. Be specific with regard to specification, features, characteristics, requirements, capabilities and compatibility. (Attach additional documents, if necessary):

SFAWTF MBR Clusters 1-4 are filled with KSS membranes with remaining life of ~10 years. It would cost millions of dollars to use another membrane manufacturer, well surpassing the cost of buildout with KSS membranes.

2. Will this purchase obligate us to a particular vendor for future purchases? (Either in terms of maintenance that only this vendor will be able to perform and/or if we purchase this item, will we need more "like" items in the future to match this one?) Explain in detail.

Yes, will need to continue to use KSS membranes in Clusters 1-4 until at least the end of useful life. Will use competitive membrane purchase to buildout clusters 5&6 in future project (Phase 3D).

3. Explain the impact to the County or Public if this request is not approved.

Increased risk of sewer spills and violation of plant's NPDES permit, polluting waterways and associated fines by regulatory agencies.

I hereby request that this non-competitive procurement request be approved for the purchase of the above stated work, material, equipment, commodity, or service.

Department Director (Typed/Printed Name) Reginald Wells Signature: Reginald Wells Digitally signed by Reginald Wells Date: 2026.02.11 11:36:40 -0500 Date: 02/11/26

Do Not Write Below – for the Department of Purchasing and Contracting Use Only

Procurement Agent (Typed/Printed Name) Victor Wills Signature: Victor Wills Digitally signed by Victor Wills Date: 2026.03.26 16:39:36 -0400 Date: 03/26/26

Procurement Manager (Typed/Printed Name) Victor Wills Signature: Victor Wills Digitally signed by Victor Wills Date: 2026.03.26 16:39:36 -0400 Date: 03/26/26

Approved Not Approved

CPO approved based on the imminent threat to health, welfare, and safety to property and citizens due to the need to quickly increase capacity of the County's wastewater treatment facility.

Signature: Michelle Butler, Director, Department of Purchasing and Contracting Date: _____

(Additional information, attach pages if required):

The total price for KSS membranes to buildout SFAWTF clusters 1-4 is \$5,360,000.00.

The membranes have a long lead time from purchase until delivery to the plant. Through this Non-Competitive Purchase Request, the County is contracting for the membranes and making the downpayment of \$550,000 to start membrane production so that the membranes will be installed prior to the Dec 2027 Consent Decree deadline for the Phase 3C project.

The KSS membrane contract will be assigned to the to-be-selected SF Phase 3C General Contractor (GC). The GC will complete the purchase of the membranes and install the membranes.

Honorable Board of Commissioners
DeKalb County, Georgia

Re: Emergency Purchases

Within the Snapfinger Wastewater Basin, there are 15 capacity related Priority Fix List (PFL) sites along the Shoal Creek Trunk, Cobb Fowler South Trunk, and Doolittle Trunk, that historically experience Sanitary Sewer Overflows (SSOs) during rain events. SSOs are shown to have adverse impacts on human health and the environment through direct contact of sanitary sewage to waters of the state, violating the Clean Water Act and the Georgia Water Quality Control Act. The County has completed project designs, has schedules in place, and have already initiated two contracts (out of several contracts) to expand system capacity and address these sites. However, due to the extensive nature of these projects (miles of large sewer pipe installation going under I-285, I-20 and several state highways and within communities), the projects are not scheduled to be complete until 2037.

The Department of Justice, the Georgia Attorney General's Office, the Environmental Protection Agency, and the Environmental Protection Division are now mandating that while these scheduled projects are being constructed, that the County perform additional unplanned and unanticipated projects to reduce the size and occurrence of SSOs in the interim, at the risk of severe stipulated penalties. The County is committed to reducing the impact of SSOs at PFL sites to the community by assigning work on an emergency basis to various contractors to perform:

1. temporary bypass pumping for an additional intake to the wastewater treatment plant;
2. temporary treatment capacity membrane purchase until the new membrane system is purchased and installed in cluster 5 and 6;
3. emergency construction to increase the resilience at the treatment facility and treatment capacity; and
4. installation of interim in basin mini-storage pipes.

DWM does not have current contracts to complete these unexpected projects and would like to issue multiple emergency contracts to on board various vendors as described in the attached non-competitive purchase requests.

Maria Houser
Director Environmental Compliance, CIP and Consent Decree
DeKalb County Government
Manuel J. Maloof Center | 1300 Commerce Drive | Decatur, GA 30030 Email:
mvhouser@dekalbcountyga.gov
Website: www.dekalbcountyga.gov
Office: 770-621-7244
Mobile: 470-633-1144



PURON® MBR SYSTEM EXPANSION

Ref: Snapfinger 3C Project

DEKALB COUNTY

1580 Roadhaven Drive
Stone Mountain, Georgia 30083
Attn: Kenneth Gobin
cc: Anthony Zamarro, CDM Smith

KOVALUS SEPARATION SOLUTIONS™, LLC

Tami Gaden | Outside Sales Manager
M (978) 821-8447
tami.gaden@kss-sep.com

FIRM PROPOSAL

25-1279-4
January 28, 2026



KOVALUS FIRM PROPOSAL

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Proprietary Notice

All information supplied herewith, including without limitation technical or financial data, know how, formulae, processes, designs, photographs, drawings, specifications, software programs and samples and any other material bearing or incorporating any information relating to **KOVALUS SEPARATION SOLUTIONS™, LLC (“Kovalus” or “KSS”)** products or systems is proprietary information belonging to Kovalus. Such information shall not be copied, reproduced, used or disclosed, (in whole or in part) without the prior written consent of Kovalus for any purpose other than that for which it has been supplied.

For related patent and trademark information, visit: www.kovalus.com/Legal



INTRODUCTION

Thank you for your interest in our PURON® MBR products for your retrofit project. For over half a century, **KOVALUS SEPARATION SOLUTIONS™, LLC (“Kovalus” or “KSS”)** has been a world-class developer and manufacturer of innovative membrane filtration systems serving a global marketplace. We build custom and pre-engineered systems for a broad array of industries, and provide superior technical and customer service support.

In Kovalus, you will find a partner that is ISO 9001:2015 certified with in-house engineering, design, and technical support capabilities. We continue to set the standard as an industry-leading membrane system provider.

KOVALUS PURON® MBR SOLUTION

The use of membrane bioreactors (MBR) for wastewater treatment was first introduced over 30 years ago. MBRs, like conventional secondary treatment, utilize activated sludge but in place of gravity clarification MBR employs a physical barrier in the form of a membrane for solid-liquid separation, limiting the passage of suspended solids, colloidal material, bacteria and other pathogens, while allowing clean effluent (permeate) to flow through.

Benefits of the PURON® MBR Product

The PURON® submerged MBR product was specifically developed for MBR applications. The main product features and advantages include:

- Reinforced, virtually unbreakable ultrafiltration (UF) hollow fiber product with optimal pore size and pore size distribution leads to high production flux rates, small system footprint and consistent, high quality performance
- Single header design, preventing sludging and clogging of the membrane modules with thick sludge, hair and other solids
- Central aeration, for efficient air scouring and fouling removal at low energy usage

Altogether, these features lead to a high efficient water quality at low life cycle cost.



PURON® PSH1800 module

Note

Information provided in this Introduction and subsequent sections, including attachments, is for reference only and should not be interpreted as a performance guarantee.

SCOPE OF SUPPLY

KOVALUS SCOPE OF SUPPLY

Equipment

For this retrofit project, Kovalus is offering the following equipment.

Table 1: Equipment components

Item	Description	Qty	Specifications
1	Membrane modules	40	PURON® PSH 1800-44-GG, each 19,375 ft ² (1,800 m ²), for a total area of 775,000 ft ² (72,000 m ²)
2	Membrane traverses	40	To be used for lifting and installation of the PURON® PSH1800 membrane modules
3	Module connection kits	40	To connect the PURON® PSH1800 modules (permeate and aeration kits)
4	Module isolation valves	lot	Module isolation valves for the PURON® PSH1800 modules; includes forty (40) permeate isolation valves and eighty (80) aeration isolation valves
5	PURON® membrane rows	1,280	PURON® PSH-41 rows, each 440 ft ² (41 m ²), for a total area of 563,200 ft ² (52,480 m ²)
6	Spare connection kit	1	Spare connection kit to connect the PURON® PSH1800 modules (permeate and aeration kits)

Engineering Support Services

Documentation

Kovalus will provide the following documentation for this project:

- Membrane assembly detail drawing
- Membrane data sheet

Technical Field Service

The following technical field service is included for this retrofit project:

- Forty (40) standard working days of onsite technical consultation support will be provided by a Kovalus field service representative during membrane installation.
- Six (6) standard working days of training will be provided by a Kovalus field service representative.
- A Kovalus field service representative will be on site for a period of seven (7) days for the commissioning monitored test.
- A Kovalus process engineer and a Kovalus controls specialist will both be on site for a period of ten (10) days to tune the PLC to the new settings.
- A Kovalus process engineer and a Kovalus controls specialist will both be on site for a period of 3 – 5 days to complete relaxation testing in compliance with the test protocol supplied by CDM Smith.

Travel expenses are included for nineteen (19) trips to the jobsite.

If needed, additional time on site can be provided at Kovalus Standard rates for technical service.



Membrane Warranty

For this retrofit project, Kovalus will provide an extended membrane warranty. Kovalus is offering a 120-month prorated warranty with a 24-month embedded cliff. The Warranty document is included as one of the attachments.

If an item is not specifically mentioned in the Kovalus scope of supply, it is not included.

BUYER'S SCOPE OF SUPPLY

The Buyer must provide installation labor and materials for Kovalus supplied equipment, and all other equipment and services for the complete start-up, operation, and maintenance of the MBR system.



COMMERCIAL PROPOSAL

FIRM PRICING

Offer Price \$5,360,000

This proposal is valid for thirty (30) days from proposal date and excludes all taxes.

PAYMENT TERMS

1. Initial downpayment of \$550,000 due upon receipt and acceptance of a signed Agreement; manufacturing of the Equipment to begin after receipt of this payment.
2. 26% of the remaining order price after initial downpayment will be due net 60 days from Notice of Equipment Availability for Shipment – Milestone 1 (33% of Equipment Available for Shipment).
3. 26% of the remaining order price after initial downpayment will be due net 60 days from Notice of Equipment Availability for Shipment – Milestone 2 (66% of Equipment Available for Shipment).
4. 28% of the remaining order price after initial downpayment will be due net 60 days from Notice of Equipment Availability for Shipment – Milestone 3 (100% of Equipment Available for Shipment). This payment and all prior payments are due prior to equipment shipment.
5. 10% of the remaining order price after initial downpayment shall be invoiced upon delivery of the equipment with payment due net 60 days from date of invoice, or 60 days after Notice of Equipment Availability for Shipment– Milestone 3, whichever occurs first.
6. 10% of the remaining order price after initial downpayment shall be invoiced upon start-up of the equipment with payment due net 60 days from date of invoice, or 180 days after Notice of Equipment Availability for Shipment– Milestone 3, whichever occurs first.

As noted in the Assignment of Contract section below, it is the intention of DeKalb County to assign this agreement to a general contractor. The County shall be responsible for making payments that become due prior to such assignment. Once the assignment to the general contractor has been made, Kovalus will direct remaining invoices to the general contractor for payment in accordance with the above payment terms; provided that Kovalus shall provide the County with a copy of each such invoice for informational purposes.

Kovalus has the right to suspend performance for delayed or non-payment of invoices. All orders are subject to credit approval prior to acceptance. Payments must be made via a financial institution that is not subject to the sanction laws of the United States, the European Union, or other applicable jurisdictions.

SHIPPING TERMS

“DDP – job site, DeKalb, County, Georgia”, per Incoterms 2020.

Unloading of Goods upon delivery and any applicable sales tax will be to the Buyer’s account.



DELIVERY LEAD TIME

The delivery lead time for the Equipment is forty (40) weeks from receipt and acceptance of signed Agreement and receipt of downpayment.

A more accurate shipping schedule will be provided at the time of order acceptance.

**Note: Lead times are subject to change due to the current and/or potential disruptions in the global freight market that can include, among other issues, delays, backlogs, and empty container shortages.*

TERMS AND CONDITIONS OF SALE

This proposal is based on Kovalus Standard Terms and Conditions of Sale (Ver 10/23) except where modified by this proposal. The Kovalus Standard Terms are hereby modified as follows:

- The second sentence of Section 3 is deleted and replaced with the following:
All payments are due net sixty (60) days from date of invoice, unless otherwise specified.
- The text of Section 6 is deleted and replaced with the following:
CONFIDENTIAL INFORMATION. *The information, drawings, plans, and specifications furnished by KSS have been developed at KSS's expense and shall not be used or disclosed by Purchaser for any purpose other than to install, operate, and maintain the goods supplied hereunder; provided, however, that Purchaser may disclose such information as required to comply with the Georgia Open Records Act, O.C.G.A. § 50-18-70 et seq., including responding to public records requests. Purchaser shall, to the extent permitted by law, provide KSS an opportunity to identify and assert applicable exclusions or trade-secret protections prior to release.*
- The first sentence of Section 20 is deleted and replaced with the following:
This agreement shall be governed by and construed in accordance with the internal laws of the State of Georgia, without giving effect to conflict of laws principles thereof.

KOVALUS CONTACT PERSON

Tami Gaden, Outside Sales Manager
M (978) 821-8447
tami.gaden@kss-sep.com

MISCELLANEOUS COMMERCIAL TERMS

Prices

All prices are stated and must be paid in U.S. dollars only.

Change in Law

The purchase price will be equitably adjusted to reflect additional costs incurred by Kovalus resulting from (i) changes in applicable laws, standards and regulations after the date of the applicable Order is placed which affect the goods or services and (ii) changes required to comply with regulatory or industrial requirements in the location

where the goods and services will be supplied. Reasonable adjustments will be made to the delivery date and any performance evaluation criteria as may be appropriate to comply with the foregoing.

Assignment of Contract

This contract will be executed in the name of DeKalb County initially. Notwithstanding any other provision of this contract, DeKalb County has the right to assign this contract for furnishing PURON equipment and ancillary services to a general contractor designated by DeKalb County, provided that such contractor has sufficient ability to satisfy all of Buyer's obligations under this contract, including but not limited to its payment obligations. Such general contractor's responsibilities will include the installation of the Kovalus equipment to be supplied under this contract. Kovalus hereby consents to such assignment subject to receipt of satisfactory evidence of such general contractor's creditworthiness.

After DeKalb County and the general contractor have entered into a separate agreement for the provision of work, including inter alia installation of the Kovalus equipment, the assignment will be documented by signing the form of Assignment of Contract; Consent to Assignment; and Acceptance of Assignment attached hereto as Attachment 5. As of the date of acceptance of assignment by the general contractor, all references in the contract to Buyer shall mean the designated general contractor.

After assignment, all warranties, guarantees, and indemnifications required by the contract will continue to run for the benefit of assignor and, in addition, for the benefit of the assignee. However, if assignor and assignee make the same warranty or guarantee claim, then Kovalus shall only be liable once for such claim.

Force Majeure

Force Majeure means any circumstances beyond the reasonable control of either party, including an act of God (such as, but not limited to unusually severe weather conditions, earthquakes, drought, tidal waves and floods), disease, epidemic, quarantine, fire, explosion, plant shutdown, strikes or other labor disputes (unless solely restricted to employees of seller), acts of terrorism or war, hostilities, act of foreign enemies, riots or other civil disturbances or voluntary or involuntary compliance with any law, order regulation, sanction, embargo, recommendation or request of any governmental authority, inability to obtain materials necessary for manufacture of the Goods, total or partial failure of any of seller's usual means of transportation of the Goods or any other events or circumstances not within the control of the party affected, whether similar or dissimilar to any of the foregoing. Neither party will have any liability, other than for the payment of monies owing, to the extent that the performance any of their contractual obligations are delayed, hindered or prevented arising out of or in connection with events of Force Majeure.

If and to the extent that a party is delayed, hindered or prevented by an event of Force Majeure, then the affected party shall be entitled to extension of time in which to perform its obligations which takes into account the duration of the Force Majeure event and any reasonable period required to recover from its impact.

Storage of Goods

If Buyer is unable or willing to accept or take delivery of the Goods within fourteen (14) days after contract agreed date, Buyer shall pay Kovalus a storage charge at a rate of two hundred dollars per square meter (\$200/m²) of floor space for each additional 30-day period, or portion thereof, of storage from the contract agreed date. Storage charges shall be invoiced monthly. Goods stored by Kovalus for Buyer under this provision shall be held at Buyer's sole risk. If the period of storage exceeds one hundred fifty (150) days from the date on which Kovalus notified the Buyer that the Goods were ready to ship, Kovalus shall have the option to provide Buyer with thirty (30) days prior written notice of its intention to terminate the agreement. If by the end of such thirty-day period, Buyer has not taken delivery of the Goods, Kovalus may, without limiting the other remedies available to it, terminate the agreement without liability to Buyer and may resell or otherwise dispose of part or all of the Goods.



Cancellation

Buyer recognizes that Kovalus designs and manufactures custom engineered systems and that each is made to order to meet our client's unique requirements. In the event that the Buyer chooses to cancel this order, for any reason, it must be in the form of written notice to Kovalus. In the event of such cancellation, the Buyer agrees to pay Kovalus for all invoices prepared in accordance with the payment terms stated herein, up to the time of order cancellation, along with those costs which arose out of or resulted from the cancellation. Materials received, work in progress, goods manufactured and results and products of the work performed, in part or whole, prior to the time of cancellation, shall be retained by and shall be the property of Kovalus. When calculating the cancellation related payments, payments made by the Buyer to Kovalus prior to cancellation shall be taken into account.

Late Payments

The lesser of either a 2.5% per month interest charge or the maximum rate allowable by law will be added to any overdue amount.

General Limits on Kovalus Liability

THIS ORDER IS EXPRESSLY LIMITED TO THE STANDARD TERMS AND CONDITIONS ATTACHED HEREIN AND MADE A PART OF THIS OFFER BY REFERENCE. KOVALUS MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY AND FITNESS FOR PURPOSE.

Agreement

This proposal, including the attachments hereto, constitutes the entire agreement between Buyer and Kovalus and supersedes all prior written or oral understandings. This Agreement may only be amended, supplemented, modified or cancelled by a duly executed written instrument signed by both Buyer and Kovalus.

Proposal Acceptance

IN WITNESS WHEREOF, the duly authorized representatives of both Buyer and Kovalus have signed this Agreement.

DEKALB COUNTY ("Buyer")	
<i>Signature</i>	_____
<i>Printed Name</i>	_____
<i>Title</i>	_____
<i>Date</i>	_____

KOVALUS SEPARATION SOLUTIONS™, LLC ("Kovalus" or "KSS")	
<i>Signature</i>	_____
<i>Printed Name</i>	_____
<i>Title</i>	_____
<i>Date</i>	_____



ATTACHMENTS

The following attachments are added to this proposal:

1. Snapfinger Expansion - 11277.13 Membrane Filtration System Specification
2. Snapfinger Expansion - 01900 Membrane Warranty
3. Kovalus Standard Terms and Conditions of Sale
4. Membrane Data Sheets
5. Assignment of Contract, Consent to Assignment, and Acceptance of Assignment

SECTION 11277.13 - HOLLOW FIBER MEMBRANE FILTRATION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Requirements specified in Article 1.2 C apply to this Section.

1.2 SUMMARY

- A. Contractor to install, test, and fully integrate with the rest of the plant the Owner-furnished membrane filtration system equipment, including interconnecting piping, power, and controls, and performing controls programming, startup, testing, and all activities required to have a fully integrated membrane filtration system, including modifications to existing equipment and piping, and installation/integration of new equipment and piping.
- B. The Membrane Filtration System Supplier (MFSS), Kovalus Separation Solutions (KSS) will provide updates and upgrades to the membrane control system so that the membrane system HMI reflects the operation of the two new Large Membrane Units (LMUs) in each basin 811 through 845, for a total quantity of forty (40) new LMUs and 1,280 additional membrane Small Membrane Units (SMUs) where empty spaces in existing LMUs remain. The MFSS will also provide supervision of the installation of the new membranes by the Contractor and membrane system startup and testing services. The Contractor will be responsible for the integration of all new upgraded control functions with the plant SCADA and ancillary PLC systems. The Contractor will coordinate this integration with an approved SCADA subcontractor approved by the County with work done to County standards. The Contractor will coordinate modifications to membrane ancillary equipment with MFSS for confirmation of a fully functional system. The Contractor will also be responsible for interconnection of the membranes to the existing plant piping and power and instrumentation and control systems and for overall startup and testing of the upgraded membrane filtration system to ensure the integrated skids are correctly interconnected and function as intended with the rest of membrane system and plant facilities.
- C. Related Requirements:
 - 1. Section 01900 for Membrane Warranties.
 - 2. DIV 13 for Instrumentation.
 - 3. Section 16726 and Section 16727 for communication cabling.

1.3 DEFINITIONS:

- A. Note that the existing KSS system uses terminology that differs from industry standards.
- B. AESS: Application Engineering Services Supplier.
- C. Basin: Hydraulic structure in which an array or lineup of membrane LMUs are connected to common headers for filtrate and air scour. These LMUs are immersed or submerged in mixed liquor. This can sometimes be called a membrane train.

- D. BOD5: Five-day biochemical oxygen demand.
- E. Cassette: a rack of membrane modules that can be taken out of the basin as a unit. Also called LMU. In KSS terminology, this is called a module.
- F. Clean-In-Place (CIP): A chemical clean done in clean water with an extended soak (approximately 4-8 hours) with a solution of either sodium hypochlorite or citric acid.
- G. Cluster: North to south grouping of 5 basins sharing common backpulse and RAS infrastructure. Term is specific to this project.
- H. Flux (gpd/sf, gfd): Instantaneous membrane throughput (gpd) at any moment in time of operation divided by the associated membrane surface area (sf).
- I. HMI: Human-Machine Interface.
- J. Large Membrane Unit (LMU): Designation for associated modules are grouped and connected to the filtrate and scour air headers, KSS refers to this as a module. It is designed to be removed and replaced as a complete unit.
- K. LCP: Local Control Panel.
- L. Maintenance Clean (MC): A chemical cleaning process performed in mixed liquor without draining the membrane tanks. This clean can utilize either sodium hypochlorite or citric acid and shall be accomplished by pumping clean water or filtrate with chemicals backwards through the membrane.
- M. MCP: Master Control Panel.
- N. Membrane Bioreactor (MBR): A system consisting of a bioreactor for the degradation of influent wastewater and nutrient removal along with a membrane filtration system for the separation of solids to produce a tertiary filtered effluent.
- O. Membrane Filtration System (MFS): System for purifying mixed liquor that includes membrane modules, LMUs, membrane support hardware, filtrate and air headers within the boundaries of the membrane tanks, filtrate pumps, RAS pumps, air scour blowers, air compressors, instrumentation, and control system.
- P. Membrane Filtration System Supplier (MFSS): A company normally engaged in the design, manufacture, startup, and support of a membrane filtration system used as an integrated part of a membrane bioreactor system.
- Q. N-1: N is the number of installed membrane basins; N-1 means that one of the installed membrane basins is not in operation and is out of service.
- R. Net Filtrate (gpd): Volume of treated effluent from a given membrane train (gal) during a typical day of operation, excluding chemical cleaning operations.
- S. Net Flux (gpd/sf or gfd): Net filtrate production (gpd) divided by the associated membrane area (ft²).
- T. NTU: Nephelometric turbidity unit.
- U. OIT: Operator Interface Terminal.

- V. OT: Operational Technology.
- W. PCSS: Process Control System Supplier.
- X. Permeability (gfd/psi): Net filtrate production (gpd) divided by the associated membrane area (sf) or net flux and divided by the transmembrane pressure (psi or kPa). This is sometimes called net specific flux.
- Y. PLC: Programmable Logic Controller.
- Z. RIO: Remote Input/Output.
- AA. SCADA: Supervisory Control and Data Acquisition.
- BB. Small Membrane Unit (SMU): Smallest assembly of the membrane train where the associated membrane fibers are connected, typically called a membrane row. Membrane module is the unit element of the LMU.
- CC. TKN: Total Kjeldhal Nitrogen.
- DD. Transmembrane Pressure (psi): Pressure differential across the membrane surfaces between water outside of membrane fiber and water inside membrane fiber.
- EE. TSS: Total suspended solids.
- FF. UPS: Uninterruptible Power Supply.

1.4 COORDINATION

- A. Coordinate Work of this Section with Work of other Sections.

1.5 ACTION SUBMITTALS

- A. Product Data: Manufacturer product data for system materials and component equipment.
- B. Shop Drawings:
 - 1. System materials and component equipment.
 - 2. Installation and anchoring requirements, fasteners, and other details.
- C. Control System Submittal:
 - 1. For equipment under this Section, submit product data sheets for each instrument per Section 13340 "Instrumentation for Process Systems."
 - 2. For each control panel, if required, submit shop drawings for each control panel per Section 13675 "Industrial Enclosures."
 - a. Include plans, elevations, sections, mounting, and attachment details.
 - b. Include diagrams for all power, communication, and signal and control wiring.
 - c. Submit heating and cooling calculations for each control panel demonstrating compliance to environmental requirements under Section 13675 "Industrial Enclosures."

- d. Submit heating and cooling calculations for each control panel demonstrating compliance to environmental requirements under Section 13675 “Industrial Enclosures.”
3. Submit a single Input/Output (I/O) Listing for the complete control system:
 - a. Sort list by the following graduation:
 - 1) Physical location.
 - 2) I/O Type.
 - 3) Loop Number.
 - 4) Tag Number.
 - b. Include description, range, engineering units, alarm data, and drawing locations.
 4. Submit a single network system architecture for the complete system
 - a. Include diagram showing all network interconnections (internal and external). Clearly differentiate internal connections from external connections.
 - b. Include details of interconnection pinouts, communication protocols, and connection parameters.
 - c. Include data map for all communication interfaces to Owner’s SCADA system. Coordinate with Owner’s AESS to establish data map.
 - d. Include details of port configurations and used of accessories (i.e. disabled ports, port lockers, etc.)

1.6 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Certificate: Products meet or exceed specified requirements and function in accordance with the intent of these specifications.
 1. This specification identifies major components of the membrane filtration system and establishes minimum equipment and quality standards for these components and the membrane filtration system.
 - a. Single Source MFSS: Provide a complete and operational membrane filtration system, including controls, whether components of membrane filtration system are specified herein or not.
 - 1) MFSS: Responsible for proper function of membrane filtration system equipment taking into account the limitations of the ancillary equipment provided by the Owner or Contractor.
 - 2) Contractor is responsible for the entire membrane filtration system including ancillary equipment associated with the membrane filtration system.
 2. Biological treatment portion of the MBR has been previously sized by a separate Engineer as part of a different project.
 - a. MFSS will review, confirm, and certify the design will not cause harm to the membranes.

- B. MFSS Instructions: Detailed instructions on installation requirements, including storage and handling procedures.
- C. Source Quality-Control Submittals: Results of factory tests and inspections.
 - 1. To ensure that all equipment required for installation of membrane filtration system, including controls, is properly coordinated and will function as a unit in accordance with the intent of these specifications, equipment specified under this Section shall be provided by a single MBR manufacturer. Manufacturer shall be responsible for proper function of all equipment integral to membrane filtration system (regardless of the original manufacturer of the various component parts) it provides as an integrated and coordinated system. Intent of this Paragraph is to establish unit responsibility with MBR manufacturer for all of equipment associated with membrane filtration system. Manufacturer shall take into account the limitations of the ancillary equipment provided by Owner or Contractor. Programming of SCADA and ancillary PLCs (other than the main MFSS PLC) is the Contractor's responsibility.
- D. Field Quality-Control Submittals: Results of Contractor-furnished tests and inspections.
- E. Manufacturer Reports: Certify equipment has been installed according to manufacturer instructions.

1.7 CLOSEOUT SUBMITTALS

- A. Project Record Documents: record actual locations of installed Membrane equipment.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Spare Parts: Provide one spare set of connection kit.”

1.9 QUALITY ASSURANCE

- A. Perform Work according to the standards set forth herein as well as standards set by the Georgia Environmental Protection Division (EPD) under the Department of Natural Resources.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Store materials according to manufacturer instructions.
- C. Protection: Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 1. Provide additional protection according to manufacturer instructions.

1.11 EXISTING CONDITIONS

- A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Membrane Filtration:

1. LMUs and SMUs to complete fill in all empty spaces in Basins 811-845, twenty (20) total basins. Support and lifting hardware required to easily install and remove new LMUs.
2. PLC-based control system with capability to communicate with and receive signals from ancillary system equipment provided by others and the plant SCADA system.
3. Anchoring Systems: For the membranes only, including anchor bolts, nuts and washers and other embedded items.
 - a. Furnished and installed by Contractor.
 - b. MFSS will provide loading data for membrane equipment.
4. The complete anchor designs and installation templates by Contractor. Utilize submerged hollow fiber PVDF membranes with a maximum pore size of 0.1 μm .
5. In-situ chemical cleaning of membranes without membrane removal from membrane basins.
6. Maximum transmembrane pressure (TMP): As defined herein shall not exceed 4 psi for all flow and operating conditions.

2.2 MEMBRANE FILTRATION SYSTEM

- A. Contractor together with MFSS are responsible for demonstrating performance criteria and design criteria as follows:

DESCRIPTION		AMOUNT
1	System Capacity per Cluster (net filtered water at 14° C).	20.0 MGD Peak Flow
2	Maximum TMP under Peak Flow Conditions.	4.0 psi
3	Average Design Condition per Cluster (at 20 deg C).	10.0 MGD Design Flow
4	Minimum influent temperature	14 degrees C
5	Maximum MLSS in membrane tank at Peak Flow Conditions	12,500 mg/L

1. Influent to Membrane Tank:
 - a. BOD5: 5 mg/L.

systems integrator and coordinated by the General Contractor.

- E. Membrane LMU Support Assemblies: Furnished by MFSS with installation instructions.
1. Individual LMUs are supported by proprietary assemblies constructed of stainless steel or engineered polymer materials, which are attached to the membrane basin support structure.
 - a. LMU Support Structure: Fabricated of Type 316 stainless steel structural members. Support brackets, anchor bolt sizing, and placement to be designed by the manufacturer. MFSS to submit calculations for support assemblies as part of the submittal process.
 - b. Modules to be connected to each other and to the filtrate manifolds in accordance with the manufacturer requirements. Membrane module connections to filtrate piping to be sealed with EPDM O-rings or hard piped to the assembly.
 - c. LMU support assembly shall support the entire membrane LMU assembly.
 - d. Design membrane racks so individual LMUs can be removed without shutting down or draining the membrane basin or assembly.
 2. Equip membrane LMUs with lifting attachment points for removing units from basins.
 - a. Provide a spreader bar or other type of lifting apparatus as needed for removing LMUs from basins.
 - b. Design lifting apparatus so it can be easily attached to LMUs without lowering the water level in the membrane basin.
 3. Membrane Supports:
 - a. Designed to resist gravitational and seismic forces while supporting membrane racks, piping, and other related equipment supported from the structure.
 - 1) Manufacturer shall submit calculations documenting compliance with these requirements in accordance with the submittal section.
 - 2) Fabricated of Type 316 stainless steel structural members. Support brackets and anchor bolts to be designed by the manufacturer. Design support assemblies for 1/4 inch maximum deflection with fully loaded modules and rack support assemblies and an additional 250 lb point load at the mid-span.
 - a) Manufacturer shall submit calculations for the support structure, assemblies and anchor bolts.
 - b. Membrane frames or racks that support membrane LMUs will also be designed to support structural grating that covers the membrane basins as indicated on the Drawings. Design structural grating (provided by Contractor) for a loading of 200 lbs per sq ft.
- F. Hollow Fiber Filtration Membrane Modules (SMU):
1. Multiple hollow fibers held together by resin pots at one or either end to form a module (SMU).
 2. Membranes to be a hollow fiber-type designed with outside to inside flow pattern.
 3. Transmembrane Pressure: maximum of 4.0 psi (as limited by available siphon pressure at the plant).
 4. Cleaning Methods:

- a. Gross solids: a combination of air scour, mixed liquor recirculation, backpulsing, and/or relaxation.
- b. Biofilm accumulation or light scale: periodic maintenance clean 1-2 times per week per membrane train using a dilute solution of sodium hypochlorite followed by a dilute citric acid/HCl solution as required.
- c. Deposited organic and inorganic materials: periodic clean-in-place occurring no more than every three months.

2.3 CONTROL SYSTEM

- A. Contractor to coordinate between MFSS and systems integrator to provide all programming necessary to integrate the additional membrane area with auxiliary systems to provide sufficient air, water, and chemical to do adequate cleaning of the membranes.
- B. Refer to DIV 13 for instrumentation.

2.4 SOURCE QUALITY CONTROL

- A. Provide shop inspection and testing of ultrafiltration membrane modules.
- B. Owner Inspection:
 1. Make completed MBR available for inspection at manufacturer's factory prior to packaging for shipment.
- C. Owner Witnessing:
 1. Allow witnessing of factory inspections and test at manufacturer's test facility.
- D. Certificate of Compliance:
 1. If fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
 2. Provide shop test results for Work performed by approved fabricator.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. New membrane installation to be done one basin at a time and coordinated with Owner to minimize impact to existing operations.
- B. MFSS On-Site Representative:
 1. At Owner's discretion, MFSS on-site representative to be present on-site during different phases of the installation of Equipment to oversee proper placement and installation of MFSS supplied Equipment.
 2. Present on-site at various phases of the work for a minimum of 40 days in a minimum of eight trips to assist with proper placement and installation of Equipment.

3. Provide training on details of the installation of MFSS's Equipment.
 4. Provide information on volume and concentration of the membrane module storage solution and rinsing requirements for membrane modules.
 5. Provide services of manufacturer's authorized representatives to inspect the completed installations of the following Equipment:
 - a. Membrane Trains including modules, support hardware, LMUs, or racks.
 - b. Piping, valves and fittings, in MFSS's scope.
 - c. Field-mounted instruments and panels.
 - d. Process Control System and Instrumentation: Process Logic Controllers, Human Machine Interface.
- C. Install the modules within the following time standards, depending on crew size:
1. 60 8-hour days if a single crew used.
 2. 30 8-hour days if a double crew used.
 3. 20 8-hour days if a triple crew used.
- D. Provide field commissioning, including operational readiness testing (ORT) and functional demonstration testing (FDT).
- E. After installation is complete, pre-commissioning inspection to be performed by General Contractor or MFSS's on-site representative. Identify the following during inspection (limited to items added as part of Phase 3c Expansion scope):
1. General:
 - a. Verify Unit and Piping Installation.
 - b. Verify Valve Tags.
 2. Instrumentation and Control:
 - a. Verify PLC Communication.
 - b. Verify PC and Operator Interface Communication.
 - c. Software is configured.
 - d. Instrument is calibrated.
 - e. Control Alarm/ Interlock/ Permissive Set Points have been established.
 - f. Testing: In accordance with the requirements of Section 13340 "Instrumentation for Process Systems".
 - g. Receives and responds to Process Control Command Signals (Discrete and/or Analog).
 3. Mechanical:
 - a. Complete and clean Membrane Process Trains. Install appurtenances. Flush and pressure test unit and interconnecting piping.
 - b. Install membrane system components in accordance with MFSS's instructions and ready for commissioning.
 - c. Disinfect process Equipment pumping liquids or in contact with water.
 - d. Verify Pumps, Metering Pumps, Blowers, Compressors and Other Rotating Equipment are:
 - 1) Filled with oil.

- 2) Rotation is proper.
 - 3) Aligned properly (Mechanical Seal has been set).
4. Electrical:
- a. Local Control Panels: Installed, terminations completed, and verified.
 - b. Power Supply: Connect and verify all 480, 120, and 24VDC.
 - c. Provide documentation associated with the inspection of electrical terminations to MFSS/Contractor.
5. Identify any Equipment that has not been properly installed:
- a. Provide detailed outstanding installation issues on a Punch List.
 - b. Identify the party responsible for each correction.
 - c. Identify the items that require correction before Commissioning can begin.
- F. Once the corrections identified have been made, Engineer will issue ‘Notice of Completed Installation’ and commissioning can commence.

3.2 COMMISSIONING

- A. Oversee start-up and demonstrate operation of all Equipment and support systems provided by MFSS (limited to items added as part of Phase 3c Expansion scope).
1. Provide personnel to serve as MFSS’s on-site representative during Commissioning of Equipment.
 2. Provide instruction and supervision to properly commission the Equipment and place it into operation.
 3. Coordinate all services and activities required by this Section with Engineer, Owner, and Contractor for the installation work.
 4. Commissioning is subject to the following provisions:
 - a. Do not commence until the “Notice of Completed Installation” is issued by Engineer.
 - b. MFSS to complete commissioning within 45 days after the “Notice of Completed Installation” is issued.
 - c. Engineer to document the time when the facilities are substantially unavailable for use by MFSS to perform Commissioning. If, in the sole opinion of Engineer, the facilities are substantially unavailable to MFSS, equivalent additional Commissioning time will be granted.
 - d. Failure to complete the Commissioning as required by this Section of the Specifications within the allocated time shall constitute a failure of MFSS to provide Technical Assistance in accordance with the requirements of the Equipment Purchase Agreement.
 - e. Upon completion of Commissioning, Engineer to issue the “Notice of Completed Commissioning”.
- B. The Contractor and MFSS shall review the following equipment subsystems to ensure that they are compatible with the upgraded and expanded membrane system. Contractor and MFSS shall notify the Engineer in writing of any upgrades required to meet the performance criteria described above.

1. Membrane Trains including modules, support hardware, LMUs, or racks.
2. Pumps and motors for pumps.
3. Air Scour Blowers.
4. Compressed Air Equipment.
5. Chemical Transfer Pumps.
6. Piping, valves and fittings.
7. Field-mounted instruments and panels.
8. Process Control System and Instrumentation: Process Logic Controllers, Human Machine Interface.
9. Electrical control panels for the membrane Equipment.

3.3 START-UP AND COMMISSIONING

- A. MFSS: Coordinate services and activities required by this Section of the Specifications with the requirements of Section 13340 “Instrumentation for Process Systems”.
- B. In addition to testing required by this Section of the Specifications, MFSS to perform other tests required by the Specifications.
- C. Owner will furnish membrane cleaning and neutralization chemicals, lubricants and other materials, instruments, calibration standards, and incidental and expendable equipment required for Commissioning / placing the Equipment into operation.
- D. Do not start any system or subsystem for continuous operation unless all Equipment, including instrumentation and monitoring systems, of that system or subsystem have been tested, proven to be operable as intended by this Equipment Purchase Agreement, and approved by Engineer and Owner.
- E. Provide instructions and oversee the placement of the Equipment into operation and the performance tests to determine if the Equipment is operating properly. The purpose of these tests is to verify that the Equipment is:
 1. Properly installed.
 2. Operational.
 3. Capable of completing all operating cycle(s) free of problems; and
 4. Free from pump or valve cavitation, overheating, overloading, vibration, or other operating problems.
- F. The Detailed Plan of Commissioning Activities: Used to coordinate the activities of the commissioning process. The types of activities to be performed by MFSS include, but are not necessarily limited to, the following minimum checks:
 1. Initial Commissioning Activities:
 - a. Verify that there are no water or air leaks in the Equipment, that the piping has been installed and connected properly.
 - b. Verify that the electrical system is operating correctly.
 - c. Verify that variable speed pumps operate across the entire speed range required. MFSS personnel to work with Contractor’s variable frequency drive (VFD) manufacturer’s personnel to commission the VFDs and establish all VFD equipment settings and programming.
 - d. Verify Compressed Air System is operating properly.
 - e. Verify Air Scour Blower System is operating properly.

- f. Verify the Backpulse System is operating properly.
 - g. Verify operation and communication of Actuated Valves.
 - h. Verify installation of all new system valves.
 - i. Verify Chemical Feed Systems used for feed and backwash are operating properly.
 - j. Verify Chemical Feed Systems used in CIP.
 - k. Verify communication of Process Instruments:
 - 1) Flow Meters.
 - 2) Pressure Transmitters.
 - 3) Level Transmitters.
 - 4) Turbidity Meters.
2. Start-Up Activities:
- a. Install Membrane Modules.
 - b. Filtrate Flow / Pressure / Level Control System in Manual and Automatic Modes.
 - c. Backpulse Flow / Pressure / Level Control System in Manual and Automatic Modes.
 - d. Backpulse Process Residuals (maintenance clean) Flow / Pressure / Level Control System in Manual and Automatic Modes.
 - e. Filtration Units Placed into Service Automatic Mode.
 - f. Check Start-Up Sequence in Normal and Emergency Modes.
 - g. Check Shut Down Sequence in Normal and Emergency Modes.
 - h. Place Membrane System with additional membranes in Operation:
 - 1) Verify Filtration Sequence.
 - 2) Verify Backpulse Sequence.
 - 3) Verify Membrane Test Sequence.
 - 4) Verify Other Process Sequences.
 - i. Chemically Clean Membrane Units.
3. Commissioning Monitored Test:
- a. Operate System continuously within the required operating criteria without any failures lasting more than 1 hour for a minimum of 7 days. Failures of existing equipment in the field such as automatic valves, flow transmitters, pressure transmitters, etc. shall not constitute a failure for the purpose of this test.
- G. Oversee the installation of membrane modules.
- 1. Record location and serial number of each membrane module using a Microsoft Excel Spreadsheet:
 - a. This information will be used to document membrane warranty replacement.
 - b. MFSS to collate membrane module information and submit to Contractor.
 - 1) Data includes serial number, location, date manufactured, date installed, and any other pertinent information.
- H. Conduct a membrane integrity test on each process train.
- 1. Repair any broken fibers (labor for removal, disassembly, reassembly and replacement is by Contractor)
 - 2. Provide documentation of integrity test results for each train documenting that each

installed process cell has passed the integrity test.

- I. Provide necessary information to Engineer, related to the Equipment provided by MFSS, for use in developing electrical system studies.
- J. Assist with obtaining Georgia EPD approval for operation of the system as required.
- K. Engineer may review the operation of the Equipment to verify that the Commissioning is complete.
 - 1. Engineer may perform random tests to determine if the Equipment is operating properly and witness various operational sequences.
 - 2. Engineer may review the results of all the testing in accordance with Section 13610 “Process Control and Enterprise Management Systems General Provisions”.
 - 3. Engineer may initiate alarm conditions to determine if the control system is functioning properly.
 - 4. Engineer’s review may include a review of the HMI interface and PLC SCADA system Commissioning requirements to determine conformance with the Division 13, Instrumentation and Controls, requirements.
 - 5. Engineer may identify any Equipment that has not been properly installed, or operating, detailing the outstanding installation issues on a Punch List and note the party responsible for each correction and identify the items that require correction.
- L. Upon satisfactory completion of review, Engineer to submit to MFSS a written “Notice of Completed Commissioning”.
- M. Upon achievement of “Notice of Completed Commissioning”, Training of Operation and Maintenance Personnel and Demonstration Testing may commence.

3.4 TRAINING OF OPERATION AND MAINTENANCE PERSONNEL

- A. Training shall commence after the “Notice of Completed Commissioning” is issued.
 - 1. Training of Owner’s Personnel shall commence within a period of 5 to 21 days after the “Notice of Completed Commissioning” has been issued as mutually agreed to by Owner and MFSS.
 - 2. Training shall be completed within 60 days after Notice of Completed Installation.
 - 3. Contractor shall document the time when the facilities are substantially unavailable for use by MFSS to perform training. If the facilities are substantially unavailable to MFSS, equivalent additional time for training will be granted.
 - 4. Failure of MFSS to complete the training as required by this Section within the allocated time shall constitute a failure of MFSS to provide Technical Assistance in accordance with the requirements of this Equipment Purchase Agreement.
 - 5. Upon successful completion of the Technical Assistance required by this Section, Owner will issue a “Notice of Completed Training”.
- B. MFSS shall provide the services of factory-trained specialists to train Owner’s Personnel in the recommended operation and the preventive maintenance procedures for all Equipment provided as part of MFSS scope.
- C. Coordinate requirements of this Section with requirements of Division 13.

D. MFSS shall provide a combination of classroom and hands-on training. Conduct training at

Owner’s designated location.

E. Provide training as follows for a total of 48 hours over two shifts:

Equipment	Classroom Training (Total Hours)	Hands-On Training (Total Hours)
Membranes	8	8
Overall Membrane-Reactor Control System	8	8 (over two separate 4- hour periods)
Follow-up Training (after 6 months of operation)	8	8 (over two separate 4- hour periods)

- F. There will be 24 hours of classroom training and 24 hours of hands-on training. MFSS shall be responsible for all costs associated with training and shall provide required materials, texts, and supplies.
- G. Training shall be conducted during a typical 8-hour shift. Training hours shall be tracked and the final schedule worked out with the Owner a month prior to arranging the scheduling of the training.
- H. Provide training material to Owner in electronic format.
- I. Training shall be performed by either MFSS or qualified representatives of the component Vendors. Full training staff shall be nominated at least one month prior to the agreed start of training. CVs of nominated staff shall be made available to Owner at least 30 days prior to the agreed start of training. Changes to the agreed training staff is not permitted without the express agreement of Owner.
- J. MFSS shall be responsible for the training on the design and operation of the Equipment and systems provided. This includes:
1. Membrane Filtration Systems:
 - a. Membrane Filtration Theory.
 - b. Membrane Filtration Process Trains.
 - c. Membrane Filtration Operational Modes:
 - 1) Start Up, Shut Down.
 - 2) Filtration, Backwashing.
 - 3) Clean-In-Place.
 - 4) CEB Cleaning.
 - 5) Integrity Testing and Module Repair.
 - d. Routine and Non-Routine Maintenance.
 - e. Training on use of the HMI graphic displays and OIT graphic displays for controlling all aspects of the membrane systems and adjusting parameters, setpoints, etc. (Refer to Section 13613 for details on this training.)
 2. Control System Training:
 - a. Programmable Logic Controller Training.
 - b. HMI/OIT System Training.

3.5 DEMONSTRATION TESTING

- A. Upon completion of the Commissioning of the Equipment, perform an extended Demonstration Test on the Equipment.
1. Evaluate each membrane Cluster to meet the peak hourly flow during this testing period.
 2. Tests on two or more membrane Clusters may be conducted concurrently at the discretion of Contractor, subject to the water supply demands of Owner.
 3. Purpose of the demonstration testing is to demonstrate that the Equipment is:
 - a. Properly installed.
 - b. Ready to be placed into long-term service by Owner.
 - c. In compliance with the service conditions performance requirements (Proposal Form), material specifications, and all other requirements of these specification documents; and
 - d. In compliance with the requirements of Section 13610 “Process Control and Enterprise Management Systems General Provisions”.
- B. Demonstration Testing is subject to the following provisions.
1. Not to commence until the “Notice of Completed Commissioning” is issued.
 2. Commence within 30 days after completion of Commissioning at a mutually agreed upon time by MFSS, Owner, and Engineer.
 3. Conduct demonstration testing for a period of 3 months or longer, if deemed necessary by the Engineer, until compliance with this Equipment Purchase Agreement has been demonstrated.
 4. Unless delayed by circumstances beyond MFSS’ control, MFSS to complete testing within 6 months after the commencement.
 5. Perform in conjunction with Section 13613.
 6. MFSS shall, on an expedited basis, recommend any changes prior to retesting.
 7. Contractor will then retest the Cluster incorporating MFSS’s recommendations as appropriate.
 8. If a Cluster fails for a second time, the membrane filtration system shall be considered to be non-conforming. Failure to successfully complete the Demonstration Testing as required by this Section within the allocated time shall constitute a failure of MFSS to provide Technical Assistance in accordance with the requirements of this Equipment Purchase Agreement.
 9. In the event that the system is deemed by Engineer to have failed the Demonstration Test, MFSS can propose remedies in accordance with Section 01900 Warranties for Membrane Filtration System Performance, Article 1.2 A.1 and A.2.
 10. Use end date of Demonstration Testing as the date of the “Notice of Substantial Completion of the Membrane Systems”.
 - a. However, the “Notice of Substantial Completion of the Membrane Systems” shall not be certified by the Contractor until completion and acceptance of MFSS’s Demonstration Test Reports and completion and submission of final Operational and Maintenance Manuals.
 11. During Demonstration Testing, Owner’s personnel shall operate the Equipment in accordance with the Operation and Maintenance Manuals and training provided by MFSS.
- C. Owner: Furnish membrane Clean-In-Place (CIP) chemicals, membrane maintenance cleaning chemicals, lubricants and other materials, instruments, calibration standards, and incidental and

expendable equipment required during Demonstration Testing.

- D. For the first and last week of the Demonstration Testing period, MFSS representative to be present on-site at all times from 7 AM until 4 PM Monday through Friday. MFSS can elect to send a representative for other critical periods of operation, such as the performance of CIPs, at their discretion.
1. MFSS will provide contact information for personnel who can be reached to provide phone assistance when no representatives of the MFSS are on-site. If required by the Contractor, representatives of the MFSS will come to the site to provide assistance for a maximum of ten (10) days and two (2) trips at no additional cost to the Owner.
- E. After Demonstration Testing is completed:
1. Engineer to meet with MFSS to determine compliance with this Equipment Purchase Agreement.
 2. If the Equipment does not perform in accordance with this Equipment Purchase Agreement during Demonstration Testing, MFSS to return or remain on the Facility Site to perform all necessary corrections at the expense of MFSS until compliance with this Equipment Purchase Agreement is demonstrated.
 3. Issue “Notice of Substantial Completion of the Membrane Filtration System” after the Engineer determines that MFSS is in complete compliance with this Equipment Purchase Agreement.
- F. If any items arise and are identified by MFSS that appear to cause the Equipment to fail:
1. Engineer may, at the request of MFSS, allow for immediate modifications to the Equipment, and a restart of the demonstration test run.
 2. If the Demonstration Testing is interrupted at the request of MFSS or by the non-conformance of MFSS’s equipment, Engineer may require that Demonstration Testing be restarted from the beginning, at no cost to Owner.
- G. Restart of testing from the beginning is not required if any interruption of testing is caused by circumstances beyond the control of the MFSS (e.g., wastewater supply stop, power outage, etc.).
- H. Performance of training activities that would result in an inadvertent or unplanned shutdown of the PLC / HMI control System or otherwise interfere with the Demonstration Test. The elapsed time of Demonstration Testing prior to the interruption will be applied to the required testing period.

END OF SECTION 11277.13

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SECTION 01900
MEMBRANE FILTRATION SYSTEM EQUIPMENT AND MODULE WARRANTY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. This Section specifies the membrane system Equipment and Membrane Module warranty. The provisions of the requirements in this Section supplement and are fully incorporated into this Equipment Purchase Agreement.

1.2 EQUIPMENT WARRANTY

A. Demonstration Testing

1. Before beneficial use of the Equipment by the County, Demonstration Testing will be conducted in accordance with Section 11277.13, Part 3, Paragraph 3,5 to show that the Equipment can meet the specified performance requirements.
2. To satisfy Demonstration Testing requirements, the MFSS may provide replacement membrane modules for some or all of the non-conforming membrane modules, or may provide additional membrane modules to fill empty slots for membrane modules within the process trains, if available, under the following conditions:
 - a. The capacity of the system shall meet the performance requirements of this Equipment Purchase Agreement, including requirements of Section 11277.13 included with the contract documents.
 - b. All additional Equipment or appurtenances required to make a functional membrane system, including but not limited to racks/cassettes, piping, valves, supports, and controls, required to fill empty slots within the Equipment with new Membrane Filtration Modules shall be provided to the County by the MFSS at no additional cost to the County.
3. To satisfy Demonstration Testing requirements, the MFSS may also propose changes to the chemical cleaning procedures under the following conditions:
 - a. The capacity of the system shall meet the performance requirements of this Equipment Purchase Agreement, including the Performance Guarantees.
 - b. All additional Equipment or appurtenances, including but not limited to metering pumps, day tanks, level sensors, valves and appurtenances required to accommodate the modified chemical cleaning procedures shall be provided and installed by the MFSS at no additional cost to the County.
 - c. The MFSS shall reimburse The County for any and all increased costs that result from changes to the chemical usage established by the original equipment O&M manual for the remainder of the pro-rata warranty period.
4. Upon successful completion of the Demonstration Testing, the Membrane Filtration System Supplier (MFSS) shall be deemed to have satisfied all obligations with respect to the performance requirements, including Performance Guarantees, other than its ongoing obligation to meet the specified turbidity parameters which shall continue for

the duration of the Membrane Filtration Module Warranty.

B. Equipment Warranty

1. The Membrane Filtration System Supplier (MFSS) warrants that the Equipment is free from defects in materials and workmanship and shall conform to the turbidity requirements of this Section and Section 11277.13.
2. Equipment Defect Correction Period: MFSS's responsibility for correcting all non-conformities in the Equipment, membrane system and appurtenances supplied under this Equipment Purchase Agreement, with the exception of the membrane modules, will extend for a period of two (2) years after beneficial use of the Equipment by the County (Substantial Completion). Warranty of the membrane modules supplied under this Equipment Purchase Agreement shall meet the requirements of this Section.
3. During the Defect Correction Period for Equipment, the MFSS shall furnish an Equipment warranty certificate assuring the Equipment (including membrane filtration units and system membrane modules) will be free from defects in materials and workmanship and will meet the turbidity parameters specified in Section 11277.13.
4. If the Equipment is non-conforming, Engineer will notify the MFSS in accordance with the procedures identified in this Equipment Purchase Agreement. The County shall make available to the Supplier Equipment records for MFSS review.
5. Limitation of Membrane System and Appurtenances Warranty: The County recognizes that the occurrence of any of the following are excluded from the Equipment Warranty:
 - a. Physical damage or faulty installation by others affecting the performance of the Equipment, membrane system and appurtenances;
 - b. Material unauthorized alteration of components supplied by the MFSS; or
 - c. Improper operation or maintenance of Equipment.

Proper maintenance procedures shall be as defined by the individual component O&M manuals except as otherwise specified by the MFSS O&M manual. The MFSS shall not include language that excludes the operation of the facilities to treat the range of source water qualities as described in Section 11277.13 and utilizing the treatment chemicals as described herein such as an aluminum-based coagulant.

1.3 MEMBRANE FILTRATION MODULE WARRANTY

A. Membrane Filtration Module Warranty

1. The MFSS warrants that the Membrane Filtration Modules are free from defects in materials and workmanship and shall conform to the requirements of Article 1.2 of this Section.
2. The MFSS's Membrane Filtration Module Warranty period shall commence at Substantial Completion (Beneficial use by The County) and continue until the end of the pro-rata warranty period. The Membrane Filtration Module Warranty shall

consist of two parts: 1) a Full Replacement Period, and 2) a Pro-Rata Period. The Pro-Rata calculation of Membrane Filtration Module Price shall begin with the start of the Full Replacement Period. The Membrane Filtration Module Warranty period shall exist as a contractual obligation between the MFSS and The County.

- a. Full Replacement Period
 - 1) The Full Replacement Period shall last for 24 months after the date of Substantial Completion.
 - 2) Contractor and Supplier shall record and maintain records of the date of installation for membrane modules.
 - b. Pro-Rata Period
 - 1) The Pro-Rata Period shall commence with the end of the Full Replacement Period and last for a period of 96 months after the Full Replacement Period. The total Membrane Filtration Module Warranty Period is, therefore, 120 months from the date of Substantial Completion.
 - 2) For Membrane Filtration Modules provided to replace Membrane Filtration Modules during the Membrane Filtration Module Warranty Period, the replacement Membrane Modules shall assume the remainder of the Membrane Filtration Module Warranty Period of the Membrane Filtration Modules so placed, or one (1) year, whichever is greater.
 - 3) Contractor and MFSS shall record and maintain records of the date of installation for Membrane Filtration Modules.
3. The MFSS warrants that the Membrane Filtration Modules will be free from non-conformance in:
 - a. Materials;
 - b. Workmanship;
 - c. Membrane integrity criteria; and
 - d. Ability to meet specified turbidity parameters as set forth in Article 1.2 of this Section.
 4. If the Membrane Filtration Modules are determined to be Defective, the Supplier will remedy in accordance with this Section.
 - a. Defective Membrane Filtration Modules (i.e., Integrity Failure) may be returned to service under the conditions outlined in Paragraph 1.3.F.3.c of this Section.
 5. Changes in the MFSS established operational and maintenance guidelines cannot be applied retroactively to invalidate the Membrane Filtration System and Appurtenances Warranty.
 6. Limitation of Membrane Filtration Module Warranty: The County recognizes that the occurrence of any of the following are excluded from the Membrane Filtration System and Appurtenances Warranty.
 - a. Physical damage or faulty installation of the membrane modules by others that results in a Defect;
 - b. Unauthorized alteration of components manufactured by the MFSS;
 - c. Use of chemical cleaning solutions or procedures other than solutions and procedures approved by the MFSS;
 - d. Exposure of the membranes to unforeseen chemical constituents at concentrations above levels for times unacceptable to the MFSS. The limitations of unforeseen chemical constituents are subject to the following conditions:

- 1) The MFSS is responsible to provide to the County a listing of the known chemicals and concentrations and time of exposure that are customarily used in the treatment of water and could damage the membrane material or result in irreversible fouling. These unacceptable chemical conditions must be included in the operations and maintenance manual and reviewed in the operator training provided by the MFSS.
 - 2) MFSS is responsible for the identification of water quality parameters, instrumentation and control programming required to satisfy and maintain membrane module warranty provisions. The MFSS shall establish the instrumentation alarm limits that would prevent the operation of the equipment outside of Supplier established limits.
 - e. Improper maintenance of equipment. Proper maintenance procedures shall be as defined by the individual component O&M manuals except as otherwise specified by the MFSS O&M manual.
 - f. Bypass of a properly sized and operated fine screening system upstream of the MBR system.
 - g. Failure of the County to reasonably maintain electronic operational logs as required by the MFSS. The County will not be responsible for the maintenance of manual (handwritten) operational logs. Delivery of archival data in paper or microfiche format will be accepted should future electronic storage formats not support the current electronic format. The maintenance of electronic logs is subject to the following conditions:
 - 1) The MFSS is responsible to provide the County a listing of the operational data points that are to be electronically logged.
 - 2) The MFSS is responsible for the control programming of data points that are to be electronically logged.
 - 3) The MFSS shall identify minimum frequencies of logging of all operational data points required by the MFSS to maintain Membrane Filtration System and Appurtenances Warranty provisions.
 - 4) The County shall provide the necessary hardware, software, and protocols for archiving operational data insofar as it is possible with existing controls hardware and equipment.
 - 5) The MFSS shall establish the alarms limits that would prevent operation of the equipment outside of MFSS established limits.
 - 6) The MFSS shall be responsible for the identification and programming of system interlocks in MFSS-developed programming that would result in the operation of the system outside of the parameters required by the MFSS. The County will not be responsible for errors in MFSS-developed programming that would result in operation of the system outside of the MFSS established limits.
 - 7) The County will not be responsible for malfunctioning of instruments or control system provided by MFSS that result in a loss of data or data accuracy until the end of the Equipment Warranty Period.
7. This Warranty shall not be assigned, transferred, or delegated by the MFSS without the prior written consent of the County. Any attempted assignment, transfer, or delegation without such consent shall be null and void.

B. The County recognizes that to satisfy Warranty requirements, the MFSS may provide replacement Membrane Filtration Modules that embody changes in Membrane Filtration Module design and construction features. The County recognizes that the replacement of Membrane Filtration Modules pursuant to this Warranty with a different Membrane

Filtration Module may be acceptable under the following conditions:

1. That the specified design and operational parameters and Performance Guarantees (i.e. design flows, water quality and chemical cleaning intervals) are obtained.
2. That the change in Membrane Filtration Modules will not represent a material increase in the operational (including cleaning and/or neutralization chemical costs) or Membrane Filtration Module replacement cost to the County except as noted below.
 - a. At The County’s sole discretion, The County may accept a change in Membrane Filtration Modules that results in a material increase in chemical usage rates if a mutually agreeable method is put in place for the MFSS to reimburse the County to offset those costs.
3. The change in Membrane Filtration Modules is acceptable to the Georgia EPD. The MFSS is responsible for assisting in obtaining any necessary permits from the Georgia EPD.
4. The change in Membrane Filtration Modules will not require additional cost to the County for capital improvements to the Equipment.

C. Replacement Membrane Filtration Module Price

1. The initial Membrane Filtration Module replacement price shall be \$1,435.00 per row and the MFSS guarantees that price, during the Membrane Filtration Module Defect Correction Period, at the time of Proposal:
 - a. The current membrane module replacement price shall not exceed the cost of the initial membrane replacement price (as indicated above) escalated per the change in the Consumer Price Index (CPI) All Urban Consumers (US City Average) plus 1%.
2. During the Full Replacement Period, the MFSS shall provide replacement Membrane Filtration Modules at no cost to the County.
3. Membrane Filtration Module Replacement Price during the pro-rata warranty period shall be calculated as follows:
 - a. For Membrane Filtration Modules supplied as part of the original equipment installation for the Phase 3c Expansion:

Pro-Rata Membrane Filtration Module Replacement Price =

$$\frac{\text{Current Membrane Filtration Module Replacement Price} \times \text{Months from Notice of Commencement}}{120 \text{ months}}$$

- 1) For Membrane Filtration Modules provided to address Warranty claims:

Pro-Rata Membrane Filtration Module Replacement Price =

$$\frac{\text{Current Membrane Filtration Module Replacement Price} \times \text{Months from Date of Replacement Membrane Filtration Module Installation}}{\text{Duration in Months Between Date of Replacement Membrane Filtration Module Installation and the End of the Pro Rata Period}}$$

D. Definition of Membrane Integrity Failure.

1. A Membrane Integrity Failure Occurrence is defined by the following:
 - a. Failure to meet the following effluent turbidity values:
 - 1) 0.2 NTU for 95% of effluent turbidimeter readings.
 - 2) 0.5 NTU for 100% of effluent turbidimeter readings.
 2. In the event the Owner makes a claim based on elevated turbidity values per the above, the MFSS can request verification of the turbidity values via measurements by a certified laboratory using proper sampling and analysis methods.
 3. If a Membrane Integrity Failure Occurrence is identified, the individual modules shall be repaired and the unit will be returned to service. The Membrane Integrity Failure Occurrence shall be documented by the County.
 4. Individual Membrane Filtration Modules shall be subject to Defect Correction under the following conditions:
 - a. If a Membrane Filtration Module cannot be repaired.
 - b. If for a Membrane Filtration Module, the maximum number of fiber breakage is exceeded in accordance with Table 1 as shown below.

1) Table 1: Maximum Percentage of Membrane Integrity Failure Occurrences per Membrane Filtration Module

Any 12 consecutive months	Life of membrane module
0.5% of total fibers	1.0% of total fibers

- c. Repaired Membrane Filtration Modules that have not exceeded the fiber breakage limits can be returned to service.

1.4 SUBMITTALS

- A. Submit signed warranty documents to the County prior to the date fixed by Engineer for commencement of Demonstration Testing.
- B. Provide membrane serial numbers and lot traceability information.
- C. When a special warranty is required to be executed by a Vendor, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to Engineer for approval prior to final execution.
- D. Prior to Demonstration Testing of membrane system, compile two copies of each required warranty properly executed by the MFSS. Organize the warranty documents into an orderly sequence based on the table of contents of the pre-selection documents.

E. Bind warranties in heavy-bond, commercial quality, durable 3-ring vinyl covered Delkab County Snapfinger AWFT – Additional Membrane Area for Clusters 1-4

loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-in by 11-in paper.

- F. Table of Contents: Neatly typed, in the sequence of the table of contents of the pre-selection documents, with each item identified with the number and title of the specification Section in which specified, and the name of the product or work item.
- G. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product, including the name of the product, and the name, address and telephone number of the Vendor.
- H. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES," the Project title or name, and the name, address and telephone number of the responsible principal.
- I. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.5 WARRANTY REQUIREMENT

- A. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the MFSS of the warranty on the Equipment that incorporates the products, nor does it relieve Vendors required to countersign special warranties with the MFSS.
- B. EXCEPT FOR THE EXPRESS WARRANTIES STATED HEREIN, MFSS DISCLAIMS ALL OTHER WARRANTIES, INCLUDING ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.
- C. For avoidance of doubt, the County and MFSS understand and agree that MFSS' warranties for the equipment supplied by MFSS pursuant to Archer Western Construction Agreement Number 215091P09 (the "Existing Equipment") will not be adversely impacted by the installation of the equipment to be supplied by the MFSS pursuant to the current contract between the County and MFSS (the "New Equipment"), provided that both the Existing Equipment and the New Equipment are properly installed, maintained and operated by or on behalf of the County. In addition, the County and MFSS understand and agree that MFSS' warranties for the New Equipment will not be adversely impacted by the Existing Equipment, provided that both the Existing Equipment and the New Equipment are properly installed, maintained and operated by or on behalf of the County.

1.6 DEFINITIONS

- A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to Contractor.
- B. Special Warranties are written warranties required by or incorporated in this Equipment Purchase Agreement, either to extend time limits provided by standard warranties or to provide greater rights for Contractor.

- C. Warranty Period shall have the same meaning as Defect Correction Period in the Agreement.

1.7 LIMITATION OF LIABILITY

- A. Except to the extent prohibited by law, MFSS' cumulative liability is limited to the amount of the total payments MFSS receives hereunder.
- B. MFSS shall not be liable for special, indirect, incidental, or consequential damages, including loss of profits, revenues, or other economic losses, however arising.

END OF SECTION

STANDARD TERMS AND CONDITIONS OF SALE



KROVALUS SEPARATION SOLUTIONS™, LLC ("KSS") provides the following Standard Terms and Conditions of Sale ("Terms and Conditions"), which apply to all quotations and sales made by KSS. All purchases by customer, owner, or its agent ("Purchaser") are expressly limited and conditioned upon acceptance of the following Terms and Conditions, and no provision, printed or otherwise, contained in any order, acceptance, confirmation, or acknowledgement which is inconsistent with, different from, or in addition to these Terms and Conditions is accepted by KSS unless specifically agreed to in writing by KSS. Acceptance of Purchaser's order by KSS is subject to verification of Purchaser's creditworthiness.

1. TIME LIMIT. All quotations are valid for a period of sixty (60) days, unless otherwise specified.

2. SHIPMENT. Pricing and shipping terms shall be ex-works the manufacturing facility. If the Purchaser has not issued inspection or shipping instructions by the time the Goods are ready for shipment, KSS may select any reasonable method of shipment, without liability by reason of its selection. Shipments made on Purchaser's behalf shall be insured at Purchaser's expense. If KSS is required to arrange for shipment of the Goods or any parts thereof, Purchaser shall reimburse KSS for all freight, insurance and other shipping related costs and Purchaser will pay KSS a handling fee for each such shipment. Shipment of Goods held by reason of Purchaser's request or inability to receive Goods will be at the risk and expense of Purchaser. Claims for shortages in shipment shall be deemed waived unless made in writing to KSS within ten (10) days from date of invoice.

3. PAYMENT TERMS. Payments will be made in accordance with the specified payment schedule. All payments are due net thirty (30) days from date of invoice, unless otherwise specified. Purchaser's failure to make payment when due will be a material breach of the order and these Terms and Conditions. KSS, at its sole option and without incurring any liability, may suspend its performance until such time as the overdue payment is made or KSS receives assurances, adequate in KSS' opinion, that the payment will be promptly made. In the event of such suspension of performance by KSS, there will be an equitable adjustment made to the delivery schedule and order price reflecting the duration and cost resulting from such suspension. Purchaser may only suspend the order upon KSS' written consent. In the event of such Purchaser suspension, the delivery time will be changed, taking into account the suspension, and Purchaser will promptly pay KSS for all costs and related overhead costs resulting from such suspension. KSS will equitably re-price the goods and services if the cumulative suspension exceeds ninety (90) days. If in the judgment of KSS, Purchaser's financial position does not justify the terms of payment specified, KSS may require full or partial payment prior to shipment of the goods. Purchaser agrees to furnish KSS with the required credit information. Payments for all export shipments will be in accordance with the specified payment schedule included herein by way of an Irrevocable Letter of Credit, established in favor of KSS, drawn on and confirmed by a prime U.S.A. bank that is approved by KSS. This Letter of Credit is to be established at the time of award of an order. All costs associated with the Letter of Credit will be for the Purchaser's account.

4. TAXES. Federal, state, or local indirect taxes, including but not limited to sales and/or use taxes, VAT taxes, GST taxes, transfer taxes or any similar tax are not included in the prices set forth herein.

5. WARRANTY. KSS warrants only that all goods manufactured by KSS, except membranes, shall be free from defects in material and workmanship; provided, however, that this warranty shall be limited to goods found to be defective within a period of one (1) year from initial use or fifteen (15) months from the date of shipment, whichever expires first, except as may otherwise be provided ("Warranty Period"). MEMBRANES ARE SOLD AS IS. This warranty does not cover Purchaser furnished/specified equipment and/or Purchaser furnished materials. Resale products shall carry only the warranty offered by the original manufacturer and no warranty by KSS.

The sole and exclusive remedy of the Purchaser for any liability of KSS of any kind, including (a) warranty, express or implied whether contained in the terms and conditions hereof, or in any terms additional or supplemental hereto, (b) contract, (c) negligence, (d) tort, or (e) otherwise, is limited to the repair or replacement, FOB point of manufacture, by KSS of those goods which an examination by KSS reveals to be defective during the Warranty Period, or at KSS' option to refund to Purchaser the money paid to KSS for such goods. Purchaser and KSS may mutually agree to acceptance of the goods to be designated "as is" with an agreed upon reduction in price. KSS will have no obligation to remedy defects unless, within the Warranty Period, Purchaser gives KSS written notice of its claim and returns the defective goods after receipt of shipping instructions from KSS to return such goods. Purchaser will ship the goods to KSS, freight prepaid, and KSS will return the goods to Purchaser, freight collect. All goods returned for repair or replacement pursuant to this section are to be packaged in accordance with the instructions received.

In no event shall KSS incur any obligation to repair or replace goods which are determined by KSS to be defective due to customer misuse, or due to use not in accordance with specified operating conditions, and operating and maintenance instructions. KSS retains the option to witness the operation of the goods to verify operating conditions. KSS shall not incur any obligation hereunder with respect to goods which are repaired or modified in any way by the Purchaser without KSS prior written approval. Installation by the Purchaser during regular intervals of normal maintenance of parts supplied by KSS shall not constitute such modification.

EXCEPT FOR THE EXPRESS WARRANTY STATED HEREIN, KSS DISCLAIMS ALL WARRANTIES WITH RESPECT TO THE GOODS, INCLUDING ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.

6. CONFIDENTIAL INFORMATION. The information, drawings, plans, and specifications being furnished by KSS have been developed at KSS' expense and shall not be used or disclosed by Purchaser for any purpose other than to install, operate, and maintain the goods supplied hereunder.

7. DELIVERIES. The delivery date(s) quoted are based on KSS' best estimate of a realistic time when delivery to the carrier will be made, and are subject to confirmation at time of acceptance of any resulting order. KSS reserves the right to make either early shipment or partial shipments and invoice Purchaser accordingly.

8. EXCUSABLE DELAYS. KSS shall not be liable for loss, damages, detention, or delays resulting from causes beyond its reasonable control or caused by but not limited to strikes,

restrictions of the United States Government or other governments having jurisdiction, delays in transportation, inability to obtain necessary labor, materials, or manufacturing facilities, or any other cause reasonably beyond its control, whether similar or dissimilar to those listed.

9. PATENTS. The Purchaser will indemnify and hold KSS harmless against any expense or loss or other damage resulting from infringement of patents or trademarks arising from KSS compliance with any designs, specifications, or instructions of the Purchaser. In addition, all license fees and royalties are the exclusive responsibility and liability of Purchaser.

10. TITLE AND RISK OF LOSS OR DAMAGE. Title, risk of loss and/or damage will pass to the Purchaser upon shipment of the goods.

11. INSTALLATION/SERVICE. Installation of goods furnished hereunder will be by the Purchaser, unless otherwise agreed to in writing.

Field service will be provided on a per diem basis upon written authorization by the Purchaser and will be at the rates in effect at the time such services are provided, unless otherwise agreed in writing. Field service at the job site to diagnose equipment problems will be provided on a per diem basis at the then-current rates.

12. CANCELLATION. Cancellation of any order must be by written notice to KSS and will be subject to cancellation charges, which will include all expenses incurred by KSS and a reasonable profit on the sale.

13. RESTOCKING FEE. If Purchaser orders the wrong material, it may NOT be returned to KSS unless the following conditions have been met:

- KSS has authorized the return of the material, and has issued a Return Material Authorization Number;
- the material is unused and undamaged;
- the material consists of standard KSS membranes, U-bends, or gauges;
- the material is returned with all freight costs paid for by Purchaser; and
- Purchaser pays a restocking fee of twenty percent (20%) of the original purchase price.

NOTE: KSS will not authorize or accept the return of any system or cleaning chemicals under any circumstances.

14. LAWS, CODES, AND STANDARDS. Except as expressly stated herein, the price and schedule included herein are based on United States laws, codes, and standards in effect as of the date of this order. Should such laws, codes, and standards change and increase or decrease the cost of performing the work or impact the schedule, KSS will advise Purchaser of such change. Purchaser and KSS will mutually agree to any modification of the order resulting from such change.

15. CONSEQUENTIAL DAMAGES; LIMITATION OF LIABILITY. KSS WILL NOT BE LIABLE FOR ANY LOST PROFITS, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND, WHETHER ARISING UNDER WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY, INDEMNIFICATION, OR ANY OTHER CAUSE OR COMBINATION OF CAUSES WHATSOEVER. THIS LIMITATION WILL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY. In no case will KSS' liability exceed the amount paid to KSS by the Purchaser for the specific goods giving rise to such liability. Purchaser agrees to indemnify and hold KSS harmless from and against all liabilities, claims, and demands of third parties of any kind relating to the goods and their use arising after shipment of the goods.

16. MODIFICATION. No change, modification, or waiver to any terms or scope of the order will be binding and valid unless it is accepted in writing and signed by an authorized representative of KSS.

17. ASSIGNMENT. This order may not be transferred or assigned by operation of law or otherwise, without the prior express written consent of KSS. Any transfer or assignment of any rights, duties, or obligations hereunder without such consent shall be void. Provided, however, that KSS will not be prohibited from subcontracting all or a part of its obligations under this order.

18. EXPORT SALES. No provision of this agreement will be construed to require KSS to export or deliver any technical information, data, and/or equipment if such export or delivery is then prohibited or restricted by any law or regulation of the U.S. Government. Purchaser will comply with all applicable export and reexport control laws and regulations, including without limitation, the Export Administration Regulations (15 C.F.R. Parts 730, et seq.) maintained by the U.S. Department of Commerce and the Office of Foreign Assets Control Regulations (31 C.F.R. Chapter V) of the U.S. Treasury Department. Specifically, Purchaser will not, directly or indirectly, sell, export, reexport, transfer, provide, divert, loan, lease, consign, or otherwise dispose of goods, services, software, source code, or technology received in connection with this order to any person, entity, or destination prohibited by the laws or regulations of the United States, without obtaining prior authorization from the competent government authorities as required by those laws and regulations. Notwithstanding any other provision of this order, Purchaser will not be required to take or refrain from taking any action penalized under the laws of the United States or any applicable foreign jurisdiction, including without limitation, the antiboycott laws administered by the U.S. Commerce and Treasury Departments.

19. INSURANCE. Upon the request by Purchaser, KSS will provide a Certificate of Insurance evidencing the following types of insurance:

<i>Workers Compensation</i>	Statutory	
<i>Employer Liability</i>	\$1,000,000.00	
<i>Comprehensive General Liability</i>	\$1,000,000.00	\$1,000,000.00
	Combined Single Limit for BI & PD	aggregate
<i>Comprehensive Auto Liability and Physical Damage</i>	\$1,000,000.00	\$1,000,000.00
	Combined Single Limit for BI & PD	aggregate

20. GOVERNING LAW. All matters involving the validity, interpretation, and application of these Standard Terms and Conditions of Sale will be controlled by the laws of the Commonwealth of Massachusetts, United States of America. The parties disclaim any applicability of the U.N. Convention on the International Sale of Goods to the order.

21. HEADINGS. The headings used throughout are for convenience only and will be disregarded for the purpose of construing and enforcing this agreement.

PURON® Hollow Fiber Modules

Hollow Fiber Submerged Membrane Modules for MBR Applications

PRODUCT DESCRIPTION	
Membrane Chemistry:	Proprietary PVDF
Membrane Type:	Braided hollow fiber for outside-in operation
Fiber Support Chemistry:	Polyester
Nominal Pore Size:	0.03 µm
Outside Fiber Diameter:	0.1 inch (2.6 mm)
Regulatory Information:	Accepted by California Department of Public Health (CDPH) for compliance with California Water Recycling Criteria (Title 22)
Potting Material:	Proprietary epoxy compound
Module Frame Material:	316 Stainless Steel
Permeate Collection Tube Material:	ABS, PVC, PE manifolds
Storage Solution:	Glycerin

PRODUCT SPECIFICATIONS		
Model	Membrane Area ft ² (m ²)	Rows per Module
PSH 330	3,552 (330)	8
PSH 660	7,104 (660)	16
PSH 1800	19,375 (1,800)	44

OPERATING AND DESIGN INFORMATION*	
Temperature Range:	41 - 104°F (5 - 40°C)
Maximum Filtration Transmembrane Pressure:	9 psi (0.6 bar)
Maximum Backflush Transmembrane Pressure:	9 psi (0.6 bar)
Allowable pH Range for Cleaning:	2.0 - 10.5
Maximum Allowed Total Chlorine @ 95°F (35°C) or Lower:	1,000 ppm @ pH 8 or higher during maintenance clean
Maximum Allowed Total Chlorine @ 95°F (35°C) or Lower:	2,000 ppm @ pH 8 or higher during recovery clean
Maximum Allowed Total Chlorine Contact:	1,000,000 ppm-hrs cumulative

*Consult KSS Process Technology Group for specific applications.

NOMINAL DIMENSIONS								
Model	L		W		H		Dry Weight	
	inches	mm	inches	mm	inches	mm	Pounds	kg
PSH 330	35.67	906	35.16	893	98.25	2,496	771	350
PSH 660	65.43	1,662	35.16	893	99.61	2,530	1,442	654
PSH 1800	88.35	2,244	69.10	1,755	99.61	2,530	3,434	1,570

*See Outline drawings for details

CONNECTIONS				
Model	Permeate		Air	
	Type	Size	Type	Size
PSH 330	Grooved Coupling	2" IPS	Grooved Coupling	2" IPS
PSH 660	Grooved Coupling	3" IPS	Grooved Coupling	3" IPS
PSH 1800	Pipe	Ø 200 mm	Pipe	Ø 110 mm (2x)

TRANSPORT AND STORAGE CONDITIONS:

Storage of Unused PURON® Modules

PURON modules should be stored within a temperature range of 41 to 77°F (5 to 25°C) in the original packaging material. Extended exposure to UV source must be avoided. The PURON® modules must not be stored for longer than 12 months after delivery.

Transport of PURON® Modules

During transport, PURON® modules should be stored within a temperature range of 23 to 113°F (-5 to 45°C), but they should not be kept at temperature outside the normal storage range of 41 to 77°F (5 to 25°C) for more than 6 weeks.

When the PURON® modules are being transported by ship, the PURON® module should be placed in seaworthy packaging and stored at ambient temperature, provided that such temperature is within the temperature range specified herein.

Dry-Out Protection

Once the PURON® module has been immersed in an aqueous medium, it should never be stored dry. If the membrane plant is not operated for 7 days or less, the module may be kept wet by keeping it submerged in the biomass, provided the following conditions are met

- The biomass is healthy and is aerated and the recirculation of biomass over the membrane chamber is functioning properly.
- The module is fully submerged in the biomass.
- The module aeration is switched on every 30 minutes for a period of 1 minute to assure mixing of sludge inside the module.

Storage of Used Modules

If the shutdown period is longer than 7 days, immersion in a storage solution is required. Please consult KSS for more information.

If used PURON® modules are permitted to dry out, membrane performance, such as permeability, may be adversely affected. Please consult KSS to see what steps may be taken to try to reverse such negative effects.

Proper Handling of PURON® Modules

Utmost care should be taken at all times when handling the PURON® module. Collisions, impact or hitting the ground in a rough manner may damage modules or connections.

Keep the PURON® modules free from contact with sharp or abrasive objects or exposure to heat sources. Actions that may cause sparks (e.g. welding, grinding) should be strictly prohibited in the vicinity of the modules.

The information contained in this publication is believed to be accurate and reliable, but is not to be construed as implying any warranty or guarantee of performance. We assume no responsibility, obligation or liability for results obtained or damages incurred through the application of the information contained herein. Refer to Standard Terms and Conditions of Sale and Performance Warranty documentation for additional information

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For complete contact information and listing of our global locations, visit www.kovalus.com
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PURON[®] Hollow Fiber Rows

Hollow Fiber Submerged Membrane Row for MBR Applications

PRODUCT DESCRIPTION

Membrane Chemistry:	Proprietary PVDF
Membrane Type:	Braided hollow fiber for outside-in operation
Fiber Support Chemistry:	Polyester
Nominal Pore Size:	0.03 µm
Outside Fiber Diameter:	0.1 inch (2.6 mm)
Regulatory Information:	Accepted by California Department of Public Health (CDPH) for compliance with California Water Recycling Criteria (Title 22)
Potting Material:	Proprietary epoxy compound
Storage Solution:	Glycerin

PRODUCT SPECIFICATIONS

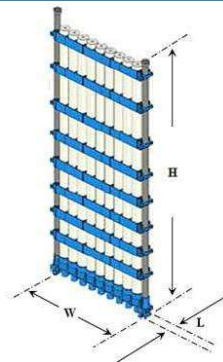
Model	Membrane Area ft ² (m ²)
PSH 31HD	330 (31)
PSH 31	330 (31)
PSH 34	370 (34)
PSH 37	400 (37)
PSH 41	440 (41)

OPERATING AND DESIGN INFORMATION*

Temperature Range:	41 - 104°F (5 - 40°C)
Maximum Filtration Transmembrane Pressure:	9 psi (0.6 bar)
Maximum Backflush Transmembrane Pressure:	9 psi (0.6 bar)
Allowable pH Range for Cleaning:	2.0 - 10.5
Maximum Allowed Total Chlorine @ 95°F (35°C) or Lower:	1,000 ppm @ pH 8 or higher during maintenance clean
Maximum Allowed Total Chlorine @ 95°F (35°C) or Lower:	2,000 ppm @ pH 8 or higher during recovery clean
Maximum Allowed Total Chlorine Contact:	1,000,000 ppm-hrs cumulative

* Consult Process Technology Group for specific applications.

NOMINAL DIMENSIONS



Model	L		W		H		Dry Weight	
	inches	mm	inches	mm	inches	mm	Pounds	kg
PSH 31HD	3.62	92	32.60	828	71.69	1,821	48.5	22
PSH 31	3.62	92	32.60	828	84.68	2,151	50.7	23
PSH 34	3.62	92	32.60	828	91.30	2,319	52.9	24
PSH 37	3.62	92	32.60	828	84.68	2,151	57.3	26
PSH 41	3.62	92	32.60	828	91.30	2,319	61.7	28

All connections: d40 threaded union

TRANSPORT AND STORAGE CONDITIONS:

Storage of Unused PURON® Rows

PURON rows should be stored within a temperature range of 41 to 77°F (5 to 25°C) in the original packaging material. Extended exposure to UV source must be avoided. The PURON® rows must not be stored for longer than 12 months after delivery.

Transport of PURON® Rows

During transport, PURON® rows should be stored within a temperature range of 23 to 113°F (-5 to 45°C), but they should not be kept at temperature outside the normal storage range of 41 to 77°F (5 to 25°C) for more than 6 weeks.

When the PURON® rows are being transported by ship, the PURON® row should be placed in seaworthy packaging and stored at ambient temperature, provided that such temperature is within the temperature range specified herein.

Dry-Out Protection

Once the PURON® row has been immersed in an aqueous medium, it should never be stored dry. If the membrane plant is not operated for 7 days or less, the row may be kept wet by keeping it submerged in the biomass, provided the following conditions are met:

- The biomass is healthy and is aerated and the recirculation of biomass over the membrane chamber is functioning properly.
- The row is fully submerged in the biomass.
- The row aeration is switched on every 30 minutes for a period of 1 minute to assure mixing of sludge inside the row.

Storage of Used Rows

If the shutdown period is longer than 7 days, immersion in a storage solution is required. Please consult KSS for more information.

If used PURON® rows are permitted to dry out, membrane performance, such as permeability, may be adversely affected. Please consult KSS to see what steps may be taken to try to reverse such negative effects.

Proper Handling of PURON® Rows

Utmost care should be taken at all times when handling the PURON® row. Collisions, impact or hitting the ground in a rough manner may damage rows or connections.

Keep the PURON® rows free from contact with sharp or abrasive objects or exposure to heat sources. Actions that may cause sparks (e.g. welding, grinding) should be strictly prohibited in the vicinity of the rows.

The information contained in this publication is believed to be accurate and reliable, but is not to be construed as implying any warranty or guarantee of performance. We assume no responsibility, obligation or liability for results obtained or damages incurred through the application of the information contained herein. Refer to Standard Terms and Conditions of Sale and Performance Warranty documentation for additional information

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**ASSIGNMENT OF CONTRACT; CONSENT TO ASSIGNMENT;
AND ACCEPTANCE OF ASSIGNMENT**

This assignment will be effective as of the date of last signature below. The contract between DeKalb County (“Buyer”) and Kovalus Separation Solutions, LLC (“Kovalus”) for furnishing PURON equipment and ancillary services pursuant to Kovalus Proposal 25-1279-4 dated January 28, 2026 (the “Contract”) is hereby assigned, transferred, and set over to _____ (“General Contractor”) as assignee, by Buyer as assignor. Upon assignment, General Contractor shall have the duties, rights, and obligations of Buyer under the terms of the Contract and will be responsible to DeKalb County under the terms of its contract with DeKalb County for the performance of obligations by Kovalus, which will become a subcontractor or supplier to General Contractor.

Assignment Made by Buyer

DEKALB COUNTY

By: _____ Date: _____
(individual’s signature) (date signed)

Name: _____ Title: _____
(typed or printed) (typed or printed)

Assignment Acknowledged and Accepted by Seller

KOVALUS SEPARATION SOLUTIONS, LLC

By: _____ Date: _____
(individual’s signature) (date signed)

Name: _____ Title: _____
(typed or printed) (typed or printed)

Assignment Accepted by General Contractor/Assignee

(typed or printed name of organization)

By: _____ Date: _____
(individual’s signature) (date signed)

Name: _____ Title: _____
(typed or printed) (typed or printed)