



OFFICE OF WASTEWATER MANAGEMENT
WASHINGTON, D.C. 20460

SOLICITATION OF PUBLIC COMMENT FOR PROJECT-SPECIFIC BUILD AMERICA, BUY AMERICA NONAVAILABILITY WAIVER PROPOSAL

SUBJECT: UNDER EVALUATION: Project-Specific Nonavailability Waiver of Build America, Buy America Act Manufactured Products Requirements to the City of Saint Cloud in Minnesota, for PVC and PVDF Coated Polyester Membrane Products

Introduction

This solicitation of public comment by the U.S. Environmental Protection Agency (EPA) is to evaluate a Build America, Buy America (BABA) waiver request submitted by an assistance recipient based on nonavailability of a product for a single project.

This solicitation of public comment does not represent a final agency decision. The purpose of this proposal is to inquire whether potential alternative BABA-compliant products may be available that were not identified by the assistance recipient or through the EPA's product research efforts, and whether other factors should be considered in the evaluation of a waiver.

The EPA has completed its market research efforts and was unable to identify an alternative BABA-compliant product meeting the performance-based specifications in sufficient and reasonably available quantities and of a satisfactory quality. The EPA makes every effort to locate BABA-compliant alternative products through its waiver process and the public comment period provides an additional meaningful opportunity to augment the Agency's research. In the EPA's experience, a viable BABA-compliant product may be identified through public comment. Through this public comment period, commenters may provide

information that indicates a compliant item is available. In that circumstance, EPA would not issue a final waiver.

Public comments are requested for 15 days (specific dates noted on the EPA's website). Please submit comments to BABA-OW@epa.gov. Please include information in the subject of the email identifying it as a public comment on this waiver request, such as "Waiver Comment: City of Saint Cloud, PVC and PVDF Coated Membranes" or similar. The proposed waiver will also be posted to the Made in America website.

Background

The Buy America Preference set forth in section 70914 of the BABA included in the Infrastructure Investment and Jobs Act (Pub. L. No. 117-58), requires that all iron, steel, manufactured products, and construction materials used for infrastructure projects under Federal financial assistance awards be produced in the United States.

Under section 70914(b), the EPA may waive the application of the Buy America Preference, in any case in which it finds that: applying the domestic content procurement preference would be inconsistent with the public interest; types of iron, steel, manufactured products, or construction materials are not produced in the U.S. in sufficient and reasonably available quantities or of a satisfactory quality; or the inclusion of iron, steel, manufactured products, or construction materials produced in the U.S. will increase the cost of the overall project by more than 25 percent. Procedurally, all proposed waivers must: (1) have a written explanation for the proposed determination; (2) provide a period of not less than fifteen (15) calendar days for public comment; and (3) be submitted to the Office of Management and Budget's (OMB) Made in America Office for review to determine consistency with policy.

Summary

Proposed Waiver: The Environmental Protection Agency is soliciting comments regarding whether to issue a project waiver of the manufactured products requirements of section 70914 of the BABA included in the Infrastructure Investment and Jobs Act (Pub. L. No. 117-58), for PVC and PVDF coated polyester membrane products used in the St. Cloud Nutrient, Energy & Water Recovery Facility project funded through the Clean Water State Revolving Fund.

Waiver Type: Nonavailability of multiple BABA-compliant products in sufficient and reasonably available quantities or of a satisfactory quality.

Waiver Level and Scope: Project level waiver for multiple products for a single project. No other project will utilize the waiver.

Proposed Waiver Description: Project-specific nonavailability waiver of BABA manufactured products requirements to the City of Saint Cloud, Minnesota (Applicant), for PVC and PVDF coated polyester membrane products.

Project Summary: This project is taking place in Saint Cloud, Minnesota. The Applicant owns and operates a wastewater treatment facility that handles municipal and industrial wastewater from Saint Cloud and the surrounding communities. Sludge produced from the facility's treatment process is stabilized through mesophilic anaerobic digestion prior to thermal hydrolysis and land application. The digestion process produces biogas that is used onsite to meet the energy demands of the facility's treatment processes. This project will upgrade the current digestion and gas storage capacity of the facility enabling the Applicant to increase the amount of biogas produced and add storage flexibility, increasing the amount of energy generated at the facility and allow a portion of this energy to be returned to the grid.

Length of the waiver: From the effective date of the final waiver until project completion, estimated to be December 31, 2029.

Summary of Items Covered in the Proposed Waiver (including NAICS): The Applicant is seeking a waiver for a PVC and PVDF coated polyester membrane product (NAICS code 313320; PSC 8305) and PVC coated polyester membrane product (NAICS code 313320; PSC 8305), which includes components such as cables and wall brackets, center cable tension hub, membrane seals and clamp bars, flexible air supply and purge takeoff line, cable catcher, and anchor bolts. The PVC and PVDF coated membrane products are BABA manufactured products. The Applicant proposes to procure the PVC and PVDF coated polyester membrane product and the PVC coated polyester membrane product which are not certified, BABA-compliant manufactured products. No compliant alternative products were identified by the Applicant, or through the EPA's market research completed in July 2025.

For additional information on the project and waiver request, see the attached original waiver request from the assistance recipient and supporting documents.

Description of Efforts Made to Avoid the Need for a Waiver

The Applicant made a good faith effort to identify alternative compliant products that meet project specifications. They were unable to find other similar products that were BABA-compliant and would meet the technical specifications of the project.

The EPA also conducted market research in July 2025. The market research process included thorough review of the waiver request submission, examination of domestic

manufacturer catalogs and other technical data and marketing materials, and communication with domestic manufacturers.

The EPA researched and contacted twelve (12) PVC and PVDF coated membrane manufacturers and suppliers. The manufacturers were asked whether they manufacture BABA-compliant PVC and PVDF coated polyester membranes that meet the project's specifications, and if so, what the estimated lead time would be. No (zero) manufacturers stated that they offer BABA-compliant products meeting project specifications.

Anticipated Impact if No Waiver is Issued

Absent a waiver from the EPA, the Applicant will be unable to complete necessary upgrades to the sludge digestion process and biogas storage capacity at the wastewater treatment plant, and the project could not move forward as planned. Without a waiver, the biogas produced at the wastewater treatment plant will not be sufficient to meet the energy demands of the wastewater treatment process. Additionally, the gas storage capacity for the facility will not be increased, limiting storage flexibility and eliminating the ability to return energy to the grid.

Description of Award

Recipient Name and/or Unique Entity Identifier (UEI): G5T3YHF2G9N7

Federal Financial Assistance Identification Number (FAIN): N/A

Federal Financial Assistance Listing Name: 66.458 Clean Water State Revolving Fund

Federal Financial Assistance Listing Number: 66.458

Agency CGAC: 068

Federal Financial Assistance Funding Amount: \$8,100,000

Total Cost of Infrastructure Expenditures: \$8,100,000

From: [Spencer, Tasha \(MPCA\)](#)
To: [BABA-OW](#)
Cc: [REDACTED]
Subject: BABA Waiver Request- SRF Funding Recipient St. Cloud Nutrient, Energy & Water Recovery Facility (MN)
Date: Wednesday, July 16, 2025 12:22:20 PM
Attachments: [image001.png](#)
[14468 BABA Waiver with Attachments Signed 250715.pdf](#)

Caution: This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Hello,

The Minnesota Pollution Control Agency (MPCA) has received a waiver request of the Build America, Buy America Requirements based on nonavailability of specific products for a single project. This waiver request was submitted by St. Cloud Nutrient, Energy & Water Recovery Facility for the 2022 Energy & Equipment Improvements Project (MPCA Project Number 280857-PD00).

The waiver request is for [REDACTED] - **PVC and PVDF coated polyester membrane** and [REDACTED] - **PVC coated polyester membrane** (additional detail included in the attached waiver request).

The MPCA has reviewed the waiver request, and would like to forward the (attached) waiver request to EPA for review.

Sincerely,

Tasha Spencer, EIT

[REDACTED]
[REDACTED]



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BUILD AMERICA BUY AMERICA WAIVER REQUEST DATA COLLECTION

This data collection is for submitting a waiver request to the Build America, Buy America requirements. According to the Build America Buy America Act (BABAA), “none of the funds made available for a Federal financial assistance program for infrastructure, including each deficient program¹, may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States.”

Waivers are explained in the [Office of Management and Budget Memorandum 22-11](#) and required by the [Infrastructure, Investments and Jobs Act](#) (IIJA) sections 70901 through 70952. Each waiver request must provide responses to the form questions, as applicable. Instructions are provided in the next paragraph. [Recipient instructions](#) can be found on pages 9 through 12 of this document. Contact your Federal Agency contact for your award or for additional assistance with completing this data collection.

Instructions: The applicant/recipient/subrecipient need to complete questions 1 through 16, sign and certify the form, and email/submit the waiver request to the Federal agency contact identified in your Federal award notification. The Federal agency will complete questions 1A through 11A. The Federal agency will review and determine to approve or not approve the waiver request.

If additional space is needed, see [attachment instructions](#) on page 8.

Required fields are marked with an asterisk (*)

Questions to be Answered by the Applicant, Recipient, or Subrecipient

1. Submitter Type: * ☒ Applicant ☐ Recipient ☐ Subrecipient

2. Submitter Contact Information

Legal Name *

City of St. Cloud, Minnesota

Address 1 *

1201 7th Street South

Address 2

City *

Saint Cloud

County/Parish

State

Minnesota

Province

Country *

United States

Zip/Postal Code *

56301-7516

3. Submitter First and Last Name*

Tracy Hodel

¹ See IIJA, § 70913(c) for description of the term “deficient program.”

6. Describe the infrastructure project description and location, to the extent known. *

The City of St. Cloud, Minnesota owns and operates a wastewater treatment facility that handles municipal and industrial waste from St. Cloud and the surrounding communities. Sludge produced from the facility's treatment process is stabilized through mesophilic anaerobic digestion prior to thermal hydrolysis and land application. The digestion process produces renewable biogas that is cleaned and combusted on site to provide clean energy for the plant's treatment systems. This project will upgrade the current the digestion and gas storage capacity of the site by increasing the number of primary digesters producing biogas, installing digester covers with a more efficient gas capture rate, and adding a second variable volume gas-storage membrane. These efforts will increase the amount of biogas produced and add storage flexibility, increasing the amount of renewable electricity produced at the facility.

7. Total funding, including federal and non-federal shares: * TBD

8. Total estimated infrastructure costs, including all federal and non-federal shares (to the extent known): * \$9,000,000

9. Is this waiver for a specific product or a category of products? Check one below: *

- a. ☒ Specific Product
b. ☐ Category of Products
-

10. Listing of Materials, Technical Specifications, and Quantity: *

List of iron or steel items, manufactured products, and construction materials proposed to be excepted from BABAA requirements, including name, cost, countries of origin (if known), and relevant Product Service Code (PSC) and North American Industry Classification System (NAICS) code for each. List each item separately. List the name of the product, how much the product costs, in U.S. dollars, the country or countries of origin, if known, and the relevant PSC and NAICS for each product. Links to manuals that provide the PSC and NIACS codes:

- PSC Codes: <https://www.acquisition.gov/psc-manual>
- NAICS Codes: <https://www.census.gov/naics/>

The membranes are provided as part of a larger packaged system. Estimated cost below is for only the membrane components:

[REDACTED] - PVC and PVDF coated polyester membrane ("Air Membrane")

[REDACTED] coated polyester membrane ("Gas Membrane")

10.1 Technical specification descriptions of items to be waived, if applicable.

See the attached technical specifications.

10.2 Quantity required: Approx. 6,000 sq ft of each membrane [REDACTED]

11. Waiver Type *

Choose one of the three waiver types listed in this section and only answer the questions applicable to the chosen waiver type.

- **Nonavailability waivers:** Complete questions [11.1.1](#), and [11.1.2](#).
- **Unreasonable Cost waivers:** Complete questions [11.2.1](#), [11.2.2](#), and [11.2.3](#).
- **Public Interest waivers:** Complete question [11.3](#).

11.1 ☒ Nonavailability Waiver

Applicable responses to the following are required:

11.1.1 A description of the due diligence performed by the applicant, including names and contact information of the manufacturers, distributors, or suppliers contacted for quotes (minimum 3), and the responses provided.

The membranes are being provided as part of [REDACTED] dual-membrane biogas storage system. [REDACTED] is being sole-sourced for this system due to modifications required to integrate the new gas storage membrane with an existing [REDACTED] storage system on site.

[REDACTED] has confirmed with their US-based fabric vendor that procures and machines the materials for the system that there are no domestic fabric suppliers that produce a membrane fabric well-suited for biogas applications.

Please see the attached email responses.

11.1.2 If one or more respondent indicated that they could provide a Build America Buy America (BABA) compliant item, but you are requesting the non-availability waiver because the lead time to obtain the BABA compliant item is excessive, indicate below how the difference in lead time between a BABA compliant and non-compliant item is going to cause the project to miss a significant milestone or deadline.

11.3 ☐ Public Interest Waiver

Explain how waiving the BABA requirement for this project or product serves the public interest.

12. Additional Waiver Information

Provide any additional information for the Agency's consideration of the requested waiver.

13. Anticipated Impacts *

Identify any anticipated impacts if no waiver is issued. Attach additional PDF pages if needed.

(See page 8 for [attachment instructions](#))

If no waiver is issued for the above products, the digester gas storage membrane will need to be excluded from the project scope, or the project will no longer be BABA compliant. This may interfere with project eligibility for other federal or state funding sources.

14. Certifying Official Name: * Tracy E. Hodel



16. Date of Certification: * 7-15-2025

SECTION 46 73 15
DUAL MEMBRANE DIGESTER COVER

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Essential characteristics and requirements for dual membrane air pressurized digester gas holder cover system.
2. Structural, material, component performance, and installation requirements for dual membrane style gas holder system.
3. Modifications to existing dual membrane gas storage system.

1.02 SCOPE

A. Manufacturer of gas holder system shall both furnish and install system, and shall assume sole responsibility for design, construction, installation, and performance of system.

B. Manufacturer of gas holder system shall include following items in scope of work.

1. Furnish and install membrane system components, including:

- a. Cables and cable wall brackets.
- b. Center cable tension hub.
- c. Air and gas membranes.
- d. Membrane seals and clamp bars.
- e. Flexible air supply and purge takeoff line.
- f. Cable catcher system.
- g. All required anchor bolts for above items.

2. Furnish and install air system components, including:

- a. Membrane Blower No. 3 (380-M-0203) with discharge check valves and isolation valves.
- b. Air Pressure Control Valve No. 1 (380-PCV-0210).
- c. Air Purge Valve No. 2 (380-FV-0222).
- d. Leak Detection Valve No. 2; solenoid valve for Air Chamber monitoring (380-FV-0220).
- e. Air Exhaust Screen.
- f. Level Element and Transmitter (340-LE/LIT-0212).
- g. Air pressure transmitter (380-PIT-0212)
- h. Air chamber gas sensor and transmitter (380-AIT-0220).
- i. Pressure gauges (380-PI-0203, 380-PI-0210).
- j. All air system ducting, piping, valves, fittings and flexible tubing.

3. Provide power and control system wiring and components internal to 380-LCP-0200.

C. The following is work of Installing Contractor:

1. Provide concrete foundation and digester wall improvements to facilitate mounting of air and gas membrane seals.
2. Piping and instrumentation removals from the existing gas storage system as depicted on the Drawings.

3. Provide concrete equipment pad for air system blower.
4. Provide interconnecting power and control system wiring and conduit external to 380-LCP-0200.

1.03 SYSTEM DESCRIPTION

- A. The membrane style gas holder system shall consist of an outer air supported sealing membrane, an inner floating gas membrane, and an air pressurization system. All membranes shall be sealed to the top of an anaerobic digester tank wall. The concrete digester wall coping and concrete equipment pads are work of the Installing Contractor.
- B. System shall create an air chamber that shall be formed between outer air membrane and floating gas membrane. Gas storage chamber shall be formed between floating gas membrane and anaerobic digester interior.
- C. One Membrane Blower shall be used to pressurize each active air chamber. Provide air pressure control valve in fan discharge line to maintain air chamber pressure at required operating pressure, set by Plant operator. Force of air chamber pressure on gas membrane shall keep digester gas operating pressure essentially the same as air pressure until digester gas storage chamber is either full or empty.
- D. System shall include controls to cycle fan when system is empty. Alarms shall be provided to warn of differential pressure or vacuum conditions that could damage gas holder or could let air into digester. Gas detector shall be provided to monitor air chamber for presence of methane.

1.04 SUBMITTALS

A. General:

1. Submit Product Data and Shop Drawings in sufficient detail to confirm compliance with requirements of this Section. Submit Product Data and Shop Drawings in one complete submittal package. Partial submittals are unacceptable.
2. Submit in accordance with Section 01 33 00.

B. Product Data and Shop Drawings:

1. Submittal shall, at a minimum, include the items listed below:
 - a. Manufacturer's specification data and descriptive literature.
 - b. Performance data.
 - c. Recommended relief valve settings.
 - d. Motors shall be in accordance with Section 26 05 84. The following data shall be submitted for each motor:
 - 1) Designation
 - 2) Horsepower
 - 3) Phases
 - 4) Voltage
 - 5) Load amperes
 - 6) Service factor
 - 7) Frequency
 - 8) Motor Code
 - 9) Thermal protection

- e. Wiring diagrams.
- f. Register map for parameters to be monitored via the Owner's process control system.
- g. Proposed coating system. Submit in accordance with Section 09 96 00.
- h. Complete assembly and installation drawings.
- i. Location of all appurtenances.
- j. Location of parts-supply facilities, service crews, and repair facilities.

C. Submit Instructional Services Documentation in accordance with Section 01 79 30.

D. Submit O&M manual in accordance with Section 01 78 23 on Operation and Maintenance Data.

1.05 QUALITY ASSURANCE

- A. Manufacturer of dual membrane anaerobic digester cover system shall both furnish and install system, and shall assume sole responsibility for design, construction, installation and performance of system.
- B. Equipment Manufacturer shall have ten (10) years of experience in application, design, and manufacture and installation of dual membrane anaerobic digester covers installed on anaerobic digesters for wastewater treatment plants.
- C. Manufacturer of dual membrane anaerobic digester cover shall have furnished and installed no less than twenty-five (25) dual membrane digester covers on active digesters in the United States.

1.06 WARRANTY

- A. Provide 5-yr prorated membrane warranty. If repair or replacement of the air or gas Membranes is required during the first 12 months of the Membrane Warranty Period, the repair work or replacement membrane will be provided by the Manufacturer at no charge. Manufacturer shall also be responsible for removal of the defective membrane(s) and installation of the repaired or replacement membrane and the costs of such removal and installation. If repair or replacement of the Air or Gas Membrane is required during the 13th-60th months of the Membrane Warranty Period, the repair or replacement membrane will be provided and installed by Manufacturer according to Manufacturer's standard warranty price schedule.

1.07 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. All other equipment and parts may be shipped to the job site prior to the membranes, and it shall be properly protected from the elements so that no damage or deterioration occurs from the time of delivery to the time when the installation is complete, and the units are placed into operation.
- B. Manufacturer shall define the requirements to properly protect the equipment and parts shipped to the job site.

1.08 PROJECT SITE CONDITIONS

A. Conditions:

- 1. Existing [REDACTED] Dual Membrane Storage system is located adjacent to the Digester Building. System consists of a 60' dia. pad-mounted dual-membrane digester

- gasholder with dual-blower air skid.
2. Dual Membrane Digester Cover will be installed on existing Digester No. 4.
 3. Refer to the contract Drawings for preparation of the top of existing anaerobic digester wall.
 4. Coordinate component sizes and assembly/disassembly requirements with existing digester.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. [REDACTED]

2.02 DESIGN REQUIREMENTS

A. Specific design requirements related to this project include:

1. Design min. pressure: 4.00" w.c.
2. Design max. pressure 8.00" w.c
3. Pressure relief valve settings: 8" w.c. press. (20% overpressure)
4. Vacuum relief valve settings: 2" w.c. vac. (50% overpressure)
5. Digester Tank Dimensions

- a. Diameter 60 feet
- b. Wall thickness 12 inches
- c. Distance from top of wall to maximum operating level 5 ft. 1 in.

- B. Gas holder system shall be designed for mounting on existing digester as indicated on Drawings. Manufacturer shall verify existing tank dimensions and existing wall conditions with Contractor.
- C. Minimum usable gas storage volume for each gas holder shall be at least 50,000 cubic feet at maximum sludge level in tank.
- D. Cover system shall be designed to permit digester gas to be stored and maintained automatically at preset constant operating pressure, as stored gas volume varies on demand. System shall accommodate gas inflow rates of up to 500 cubic feet per minute (cfm) and gas withdrawal rates of up to 500 cfm.
- E. Final system shall be capable of operating with two active holders operating as a common system, as two fully independent storage systems, or operate with a single holder at the Owner's discretion.
- F. Gas holder shall be designed to withstand wind loads of up to 90 mph at maximum design operating and emergency relief pressure.
- G. Cover system design shall allow sludge level in digester to be varied throughout entire sidewater depth of digester while still providing minimum gas storage volume above.
- H. All components of system in contact with digester gas shall either be made of materials which are not significantly affected by normal constituents of this gas or shall be given protective coating resistant to these constituents.

2.03 MEMBRANE SYSTEM AND APPURTENANCES

A. Air Membrane

1. Outer air/sealing membrane shall be fabricated from high strength vinyl coated polyester fabric specifically designed for air supported structures, tension structures, and other high stress membrane applications. PVC coating shall be specially compounded to provide long fabric life through high resistance to abrasion, weathering and ultra-violet rays.
2. Base fabric shall have weave structure of tire cord strength polyester yarns. Finished coated fabric shall have nominal weight of not less than 30 ounces per square yard.
3. Air membrane material shall have minimum warp/fill tongue tear strength of 90/65 pounds and minimum strip tensile strength of 440/435 pounds per inch.
4. Fabric shall be furnished with polymer alloy top finish to prevent plasticizer migration and to provide improved weather ability, abrasion resistance and clean ability.
5. Air membrane shall be specially fabricated, using proven techniques for air supported structures, so that fabric stress will not exceed 50 pounds per inch at maximum design pressure, including wind loads.
6. All seams in contact with air chamber shall be made by heat or induction welding. Sewing in this area will not be acceptable.
7. Air membrane color shall match existing pad-mounted dual-membrane cover.

B. Gas Membrane

1. Gas membrane shall be fabricated from material that is highly resistant to normal constituents of digester gas. Material shall consist of polyester base fabric with PVC coating.
2. Base fabric shall have weave structure of tire cord strength polyester yarns. Finished coated fabric shall have nominal weight of not less than 30 ounces per square yard.
3. Gas membrane material shall have minimum warp/fill tongue tear strength of 90/65 pounds and minimum strip tensile strength of 440/435 pounds per inch.
4. All membrane seams exposed to gas shall be made by heat or induction welding. Sewing in this area will not be acceptable. Membrane shall be designed with reinforcing (if necessary) of same material such that, at maximum design pressures, stress in fabric will not exceed 50 pounds per inch.

C. Membrane Seals

1. At tank wall, membranes shall be sealed by common seal arrangement, using layers of neoprene on either side of each membrane.
2. Seal shall be held in place on top of digester wall cap by 4-inch-wide 304 stainless steel clamping bars. Clamping bar anchors shall be stainless steel adhesive type with stainless steel washers and stainless steel nuts.
3. Seal shall be designed to provide minimum compression load of 30 psi over entire seal area.

D. Restraining Cables

1. The air membrane shall be restrained by cables, arranged uniformly and extending radially from a tension hub at the center of the air membrane to brackets at the digester walls.
2. The diameter, length, and quantity of cables shall be properly selected so as to comply with the air membrane maximum design stress requirement of 50#/inch.
3. At the maximum design conditions, including wind loads, the tension in the cables shall not exceed 50% of the rated minimum breaking strength of the cables.
4. Cables shall be of galvanized bridge rope with open spelter sockets at each end for connection to the center tension hub and the wall brackets. The spelter socket/cable

connection shall withstand a load equal to 100% of the rated minimum breaking strength of the cable.

E. Wall Brackets

1. Brackets shall be provided at the digester wall cap to facilitate anchoring of the cables. The wall brackets shall be stainless steel.
2. Wall bracket anchor bolts, washers and nuts shall be stainless steel, of a number and size adequate to meet the system design requirements.

F. Cable Tension Hub

1. A cable tension hub assembly shall be provided at the geometric center of the membranes for attaching the inboard ends of the restraining cables.
2. The cable tension hub shall be fabricated from hot dipped galvanized steel.

G. Cable Catcher System

1. Cable catcher system shall prevent damage to the gas membranes due to contact with the internal digester components and to prevent damage to the internal digester components.
2. The support system shall consist of cables spanning the interior digester walls. All cables shall be anchored to the digester walls and extend radial inward to a tension ring in the center of the digester. Cables shall be sufficiently tensioned to support the membranes if the digester is depressurized and/or dewatered.
3. All components of the cable system including cables, tension ring, brackets, anchor bolts and hardware shall be 316 stainless steel.

2.04 AIR SYSTEM COMPONENTS

A. Membrane Blower No. 3 (380-M-0203)

1. Provide one air blower for providing system pressure for the cover. Blower shall be rated to deliver 500 cfm at a 16" w.c. discharge pressure, based on standard inlet conditions.
2. Each blower shall include TEFC, 3 hp, 3500 rpm, 230/460 volt, 3 phase, 60 Hertz motor in accordance with Section 26 05 84. Motor shall be suitable for a Class 1, Division 2, Group D hazardous environment.
3. Blower shall receive power from 380-LCP-0200.
4. Blower construction shall include all welded steel housing and mounting frame with Manufacturer's standard finish inside and out. blower shall be provided with AMCA "B" spark resistant construction, including riveted or welded aluminum alloy wheel and non-ferrous through plate.
5. Provide and install flexible connectors between blower and PVC air ducting.

B. Air Pressure Control Valve No. 1 (380-PCV-0210)

1. Provide 6-inch air regulation valve weighted diaphragm type with cover for setting cover operating pressure.
2. Valve shall be adjustable in 0.25" w.c. increments through operating range from 4" w.c. to 8" w.c.
3. Lower side of diaphragm housing shall be provided with connection (including flame check) for 1/2 inch OD stainless steel tubing that shall be connected to air chamber. Upper side of diaphragm housing shall have connection for venting to atmosphere.
4. All pressure plates shall be stamped with associated pressure in inches of W.C.
5. Provide two (2) additional 0.25" w.c. plates above specified operating pressure.

C. Air Purge Valve No. 2 (380-FV-0220)

1. Provide and install 6" butterfly valve in air discharge ducting of gas holder to serve as pressure/gas purge valve. Valve shall be provided with motorized operator (██████████ or equal) in NEMA 7 enclosure. Provide full open and full close position switches for remote indication. Provide power to valve from 380-LCP-0200.

D. Gauges

1. Provide gauges with isolation valves at discharge of the blower (380-PI-0203) and at air pressure control valve (380-PI-0210). Gauges shall be ██████████.
2. Gauges at fan discharge shall have range of 0-20" w.c. Gauge at control valve shall have range of 0-15" w.c.

E. Air System Piping

1. All exterior rigid air system piping shall be Schedule 80 PVC as specified in 40 05 31.13.
2. All pressure control tubing shall be 1/2" Type 316 stainless steel as specified in Section 40 05 23.
3. All exterior flexible hose shall be heavy weight black thermoplastic rubber, reinforced with a spring steel wire helix, and UV resistant suitable for cold weather use. The hose rated pressure shall be a minimum of 5 psi. Hoses to and from the gas membrane shall be bound together using stainless steel banding with a UV-resistant coating for outdoor use.

F. Pressure Transmitter (380-PIT-0212)

1. Provide membrane cover with a single external pressure transmitter for monitoring the pressure of the air chamber between the air and gas membranes.
2. Output: 4-20 mA signal for connection to 380-LCP-0200.
3. Power shall be from 380-LCP-0200.
4. Pressure transmitter shall be ██████████.
 - a. 4-20mA HART Output.
 - b. LCD Display with LOI.
 - c. 316 SST diaphragm.
 - d. Glass-Filled PTFE O-ring.
 - e. Fill Fluid: Silicone.
 - f. FM Explosion-proof.
 - g. Aluminum Housing.

G. Level Transmitter (340-LE/LIT-0212)

1. Provide membrane cover with a laser level transmitter, mounted centrally on the air membrane for monitoring gas membrane height.
2. Transmitter shall be explosion-proof suitable for Class I, Division 1 environments.
3. NEMA 7 enclosure.
4. Output: 4-20 mA signal for connection to 380-LCP-0200. The signal shall be used to calculate the gas stored.
5. Power shall be from 380-LCP-0200.
6. Transmitter shall be provided with a 24Vdc, 3W heating element powered from 380-LCP-0200.

H. Leak Detection Valve No. 2 (380-FV-0220)

1. Provide 1" bypass line around air purge valve to allow small amount of air to continually

vent from air chamber so that it can be monitored for presence of methane gas. Bypass line shall be provided with solenoid valve (Leak Detection Valve) (380-FV-0220) and PVC ball isolation valves. Solenoid valve shall be provided with a NEMA 7 enclosure and shall be suitable for operation at ambient temperatures as low as -30°F.

I. Methane Sensor and Transmitter (380-AIT-0220)

1. Provide membrane cover with a methane detector monitoring the air chamber between the air and gas membranes. The sensor will be mounted in air purge valve bypass line to detect gas membrane leaks prior to air being discharged from the cover.
2. NEMA 7 enclosure.
3. Include display for local gas concentration readout as well as sensor calibration and setup.
4. Output: 4-20 mA signal for connection to 380-LCP-0200. Range 0-100% LEL.
5. Power shall be from 380-LCP-0200.

2.05 FASTENERS

- A. All bolts and fasteners shall be 316 stainless steel.

2.06 CONTROLS SYSTEM COMPONENTS

- A. Controls system components are to be provided and installed by the Manufacturer. If Manufacturer elects to have a System Integrator provide and install controls system components, Manufacturer shall use the System Integrator hired by the Contractor according to the Bid Form.

B. Controls system components

1. Motor starter-protector for Membrane Blower No. 3
2. Branch circuit breakers for air system components
3. I/O as defined on the PIDs.
 - a. Analog input module(s) shall be 4-point.
 - b. All I/O modules shall be conformally coated.
4. All other controls hardware as required to modify the existing controls system to fully control two dual-membrane cover systems to meet the desired functionality as described in the Functional Description in Section 40 61 13.
5. Existing control system includes Ethernet Interface for connection to [REDACTED] PLC. Actions of Owner's process control system will be limited to reading of registers in Digester Cover Control Panel PLC (monitoring only). Registers to be read shall be located in a separate file within the PLC; register map listing shall be included in submittal information. Information to be read shall be updated to include the signals below. Signals for 380 are associated with the existing storage membrane. Signals for 340 are associated with the digester cover storage membrane.
 - a. 340 Gas Storage Full
 - b. 340 Gas Storage Empty
 - c. 340 Gas Storage Volume
 - d. 340 Methane Leak (High LEL) Alarm
 - e. 340 Gas Detector Fault Alarm
 - f. 340 Gas Pressure Transmitter Fault Alarm
 - g. 340 Air Pressure Transmitter Fault Alarm
 - h. 340 Pressure Differential High Alarm

- i. 340 Pressure Differential Low Alarm
- j. 340 Pressure Differential Low-Low Alarm
- k. 340 Purge Valve Opened Status
- l. 340 Purge Valve Closed Status
- m. 340 System in Auto Purge Status
- n. 340 Air Chamber Pressure (IN WC)
- o. 340 Gas Chamber Pressure (IN WC)
- p. 340 Gas Detector % LEL
- q. 380 Gas Storage Full
- r. 380 Gas Storage Empty
- s. 380 Gas Storage Volume
- t. 380 Methane Leak (High LEL) Alarm
- u. 380 Gas Detector Fault Alarm
- v. 380 Gas Pressure Transmitter Fault Alarm
- w. 380 Air Pressure Transmitter Fault Alarm
- x. 380 Pressure Differential High Alarm
- y. 380 Pressure Differential Low Alarm
- z. 380 Pressure Differential Low-Low Alarm
- aa. 380 Purge Valve Opened Status
- bb. 380 Purge Valve Closed Status
- cc. 380 System in Auto Purge Status
- dd. 380 Air Chamber Pressure (IN WC)
- ee. 380 Gas Chamber Pressure (IN WC)
- ff. 380 Gas Detector % LEL
- gg. System General Alarm
- hh. Membrane Blower No. 1 Run Status
- ii. Membrane Blower No. 2 Run Status
- jj. Membrane Blower No. 3 Run Status
- kk. Membrane Blower No. 1 Fault Alarm
- ll. Membrane Blower No. 2 Fault Alarm
- mm. Membrane Blower No. 3 Fault Alarm
- nn. Membrane Blower No. 1 Elapsed Run Time
- oo. Membrane Blower No. 2 Elapsed Run Time
- pp. Membrane Blower No. 3 Elapsed Run Time

C. Work for Hire:

1. Any and all configuration, programming, setup or other software functions performed on all intelligent devices provided as part of this Project is to be considered "Work for Hire" under the 1976 Copyright Act as amended (title 17 of the United States Code). The Software shall be owned by Owner and shall be turned over to Owner fully documented and capable of future modification by Owner as the work is completed.
2. Owner intends to obtain the Software for its own use only.
3. Owner will not prevent the Software supplier from reuse of the Software concepts and ideas for other projects. Any reuse of the Software concepts and ideas generated under this Project is solely the responsibility of the Software supplier. The Software supplier shall defend, indemnify and hold harmless Owner from all claims, damages and expenses (including reasonable litigation costs), arising out of any use, misuse or misapplication of Software concepts and ideas.

D. Wiring:

1. Provide meeting requirements of NEC, NEMA and Division 26.
2. Keep 480Vac power, 120Vac power and discrete signals, and analog and other low voltage signals separated.
3. Do not run 480Vac power, 120Vac power and discrete signals, or analog or other low

- voltage signals in the same conduit or wire-duct.
4. Where 480Vac power, 120Vac power and discrete signals, or analog or other low voltage signals must cross, they shall do so at right angles.
 5. Wiring Within Wire Duct:
 - a. Wherever feasible plastic wire duct with cover shall be used for routing of wire within control panel.
 - b. Size wire duct to be no more than 50% full.
 - c. Maintain 2" clearance between wire duct and terminals.
 6. Wiring outside of wire duct.
 - a. Wiring outside of ducts shall be restrained by use of plastic wire-ties.
 - b. Restrain wiring every six inches (minimum).
 - c. Provide abrasion protection for wires passing through holes or across abrasive metal edges.
 - d. Adhesive type wire fasteners shall not be used. Hard screw type shall be employed.
 7. Each conductor or twisted pair cable shall be labeled near its termination point.
 8. Color-coded multi-conductor cable or multi-pair cable shall be labeled on overall jacket near its point of fan-out. Each pair of a multi-pair cable, when not color-coded, shall be labeled at its termination point in addition to the overall jacket.
 9. Labels shall be machine-printed wrap-around types with tag visible from front without removal of wire from termination.
 10. Terminations:
 - a. Wiring within control panel shall be continuous and terminated only at terminal blocks or equipment terminals. Splices or butt connectors shall not be used within panel.
 - b. No more than two wires shall be terminated at any one terminal.
 - c. Make external connections by way of numbered terminal blocks on numbered terminal strips.
 - d. When signals are powered from remote location, switched terminal blocks shall be used where conductors enter or leave panel.
 - e. When signals are powered from within panel, fused terminal blocks shall be used where conductors enter or leave panel.
 - f. Provide integral bussing system on terminal block array where more than two terminations require common source or drain connection. Jumpered terminations shall not be acceptable.
 - g. Provide knife disconnect-type terminal blocks with test sockets for all analog loops.
 - h. Include provisions for grounding of shields on shielded twisted pair cables entering or leaving panel. Cable shields shall be grounded at terminal block end only. Shields shall run entire length of cable within panels. Running of twisted pairs without shields within panels is not permissible.
 - i. Provide separate terminal strips for each of the following types of signals.
 - 1) 480Vac power circuits.
 - 2) 120Vac power circuits.
 - 3) 120Vac discrete signals.
 - 4) 12Vdc, 24Vdc or 48Vdc discrete signals.
 - 5) Analog signals.
 - 6) Serial or parallel digital communication signals.
 - 7) Intrinsically safe circuits.
 11. Power Distribution:
 - a. Provide circuit breakers for all motor starters provided.

- b. Provide separately fused power supply to each major panel component.
- c. Additional panel requirements.
 - 1) Provide separately fused power circuits for panel powered devices entering panel from field. Provide separate circuit for each device. Devices may be 5-Amp fused terminal blocks.
 - 2) Include digital transient surge suppressor/varistor installed in parallel with output contact at terminal strip for each PLC output signal driving an inductive load.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Installing Contractor to prepare digester for cover installation and provide electrical conduit, wiring, and terminations to control panel and between control panel and powered equipment and instrumentation.
- B. Dual membrane gas holder, cable catcher system, and associated equipment and piping shall be installed by equipment Manufacturer in accordance with the Contract Drawings and Specifications.
- C. Cover installation shall be coordinated with installation of internal digester piping and appurtenances.

3.02 FIELD TESTING

- A. Leak testing of membrane seals shall be performed by Manufacturer and witnessed by Owner or Owner's representative.
- B. With gas line closed, air system blower shall be used to blow air into gas storage chamber through test connection provided on gas takeoff piping. After unit has been inflated, test connection shall be capped and blower connected to air chamber.
- C. Cover is properly installed, gas and air chambers shall then be pressurized to maximum design operating pressure by installing proper weights on air pressure control valve and pressure/vacuum relief valves.
- D. Soapsuds solution shall then be applied to membrane seals around wall cap. Any area of seals observed to be leaking shall be resealed.

3.03 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services:
 - 1. Representative for equipment specified herein shall be present at the job site or classroom designated by Owner a minimum of three separate occasions for the minimum workdays specified below, travel time excluded.
 - a. 5 workdays for Installation Services.
 - b. 1 workdays for Instructional Services.
 - c. 2 workday for Post-Startup Services.
 - 2. Supplier of manufacturer shall direct services specific to system and equipment operation, maintenance, and troubleshooting. See Section 01 79 30.

3. In addition to services specified above, provide manufacturer's services as required to successfully complete system demonstration as specified in Section 01 79 10.

END OF SECTION