

TOWN OF MONTVILLE
WATER POLLUTION CONTROL AUTHORITY

83 PINK ROW
UNCASVILLE, CT 06382

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Request For Proposal (RFP)
Chesterfield Pump Station Pump Replacement

RFP ID: WPCA 2025-3

Submission deadline: April 11, 2025

Question submission deadline: March 28, 2025

Introduction:

The Town of Montville WPCA is seeking proposals for the replacement and installation of 2 dry pit submersible pumps at Chesterfield pump station located at 575 Chesterfield Road, Oakdale, CT 06370 per specifications in this RFP. Site inspections available by advance schedule.

Sealed proposals marked “WPCA 2025-3” will be received at Montville WPCA, 83 Pink Row, Uncasville, CT 06382 until 10:00 am on April 11, 2025 at which time they will be publicly opened and read aloud in the WPCA Conference Room.

For project questions please contact:

Ronald McDaniel: Montville WPCA Administrator
Montville WPCF: 83 Pink Row, Uncasville CT 06382
Phone: 860-848-6711
Email: rmcdaniel@montville-ct.org

SPECIFICATION - DRY PIT SUBMERSIBLE PUMPS

Furnish and install two (2) dry pit submersible wastewater pumps with premium efficiency motors. Pumps shall be Sulzer/ABS Model XFP 105J-CB2 PE430/4. The pumps shall be supplied with an ANSI flanged suction connection (6" minimum) and an ANSI flanged discharge connection (4" maximum). The pumps shall be capable of delivering 700 GPM at a total dynamic head of 160 feet while operating within 50% of BEP flow. Shut off head shall be a minimum of 188 feet. The motor shall be an integral part of the pump unit. The motor shall be a maximum of 58 HP. Motor speed shall not exceed 1800 RPM. Motor shall be rated for operation on 460 volt, 3 phase, 60 Hz electrical supply service. Each pump motor shall be equipped with 49 feet of power and control cable sized in accordance with NEC and CSA standards.

The heavy duty dry pit submersible wastewater pumps shall be capable of handling raw unscreened sewage, storm water, and other similar solids-laden fluids without clogging. The pumps shall be driven by a premium efficiency motor, providing the highest levels of operational reliability and energy efficiency.

Installation

At least one (1) pump (existing or new) shall remain in service throughout the project.

Installation of the new dry pit submersible pumps shall include the following scope for each pump (typical of two):

- Remove existing dry pit pump and stand
- Install channel steel subbase, weld to station floor
- Install fabricated steel dry pit stand
- Install customer provided Sulzer dry pit submersible pump
- Provide and install 4" 45, DI elbow and filler flange on discharge
- Provide and install 8" x 6" DI reducing elbow and 6" filler flange on pump suction
- Provide and install 8" spool piece DI, welded x bare end
- Provide and install 8" mega lug mechanical flange
- Install drain valve (1" minimum) on suction piping for each pump. Valve and fittings shall be stainless steel.
- Install lifting eye in the ceiling of the pump chamber. Lifting eye shall be centered above the pump to facilitate pump removal/installation. The lifting eye must be installed so that each dry pit submersible pump rotating

assembly (including the motor and impeller) can be lifted vertically. When each pump is lifted, the bottom of the impeller vane must be higher than the top of the volute.

After the first new pump is installed, it shall be operated in Auto mode for an acceptance period of no fewer than seven (7) days. After the successful completion of the acceptance test, the Owner will authorize work to commence on the replacement of the second existing pump.

Relays for motor over-temperature and moisture detection shall be provided to the Owner. Installation of the relays is by others and is not part of the scope of work.

Pump Construction

Major pump components shall be of gray cast iron, EN-GJL-250 (ASTM A-48, Class 35B) with smooth surfaces devoid of porosity or other irregularities. All exposed fasteners shall be of stainless steel, 1.4401 (AISI 316). All metal surfaces coming into contact with the pumped media (other than the stainless steel components) shall be protected by a factory applied spray coating of zinc phosphate primer followed by a high solids two-part epoxy paint finish on the exterior of the pump. The pump shall be equipped with an open lifting hoop suitable for attachment of standard chain fittings. The hoop shall be of ductile iron, EN-GJS-400-18 (ASTM A-536, Grade 60-40-18) and shall be rated to lift a minimum of four times the pump weight.

Sealing design for the pump/motor assembly shall incorporate machined surfaces fitted with Nitrile (Buna-N) rubber O-rings. Sealing will be the result of controlled compression of rubber O-rings in two planes of the sealing interface. Housing interfaces shall meet with metal-to-metal contact between machined surfaces, and sealing shall be accomplished without requiring a specific torque on the securing fasteners. Rectangular cross-sectioned gaskets requiring specific torque limits to achieve compression shall not be considered equal. No secondary sealing compounds shall be required or used.

Impeller: The Sulzer Contrablock Plus impeller shall be of gray cast iron, EN-GJL-250 (ASTM A-48, Class 35B). The impeller shall be of the semi-open, non-clogging, two-vane design, meeting the Ten State Standards requirement for minimum solids passage size of 3 inches. The impeller shall be capable of passing minimum 3-inch x 3.9-inch solids. The impeller shall have a slip fit connection onto the motor shaft, driven by a shaft key, and shall be securely fastened to the shaft by a stainless steel screw. A positively engaged, ratcheting washer assembly

shall prevent the screw from loosening. The head of the impeller screw shall be effectively recessed within the impeller bore to prevent disruption of the flow stream and loss of hydraulic efficiency. The impeller shall be dynamically balanced to the ISO 10816 standard to provide smooth, vibration-free operation. Impeller designs which do not meet the Ten State Standards requirement for 3 inch solids passage size, those that rely on retractable impeller designs to pass 3 inch solids, or those that rely on fins or pins protruding into the suction path to assist in the handling of fibrous material shall not be considered equal.

Self-Cleaning Wear Plate: The Sulzer Contrablock Plus wear plate shall be of gray cast iron, EN-GJL-250 (ASTM A-48, Class 35B). The wear plate shall be designed with a smooth surface incorporating strategically placed intercepting slots on the side facing the impeller, to shred and force any stringy solids which attempt to become lodged between the impeller and wear plate outward from the impeller and through the pump discharge. The wear plate shall be mounted to the volute with four stainless steel securing screws and four stainless steel adjusting screws to permit close tolerance adjustment between the wear plate and impeller for maximum pump efficiency. Adjustment to allow for wear and restore peak pumping performance shall be easily accomplished using standard tools, and without requiring disassembly of the pump. The use of fixed or non-adjustable wear plates or rings, or systems that require disassembly of the pump or shimming of the impeller to facilitate adjustment, shall not be considered equal. The suction flange shall be integrated into the wear plate and its bolt holes shall be drilled and tapped to accept standard 6-inch ANSI class 125/150 flanged fittings.

Pump Volute: The pump volute shall be a single-piece, gray cast iron, EN-GJL-250 (ASTM A-48, Class 35B), non-concentric design with centerline discharge. Passages shall be smooth and large enough to pass any solids that may enter through the impeller. The discharge size shall be 4-inches. The discharge flange design shall permit attachment to standard ANSI and DIN flanges/appurtenances. The discharge flange shall be drilled to accept either ANSI class 125/150 or metric flanged fittings. Proprietary or nonstandard flange dimensions shall not be considered acceptable. The minimum working pressure of the volute and pump assembly shall be 10 bar (145 psi).

Premium Efficiency Motor

The Premium Efficiency motor shall meet efficiency standards in accordance with IEC 60034-30:2008, level IE. Motor rating tests shall be conducted in accordance with IEC 60034-2-1 requirements and shall be certified accurate and correct by a third party certifying agency. A certificate shall be available upon request.

The motor shall be housed in a watertight gray cast iron, EN-GJL-250 (ASTM A-48, Class 35B), enclosure, capable of continuous submerged operation underwater to a depth of 20 meters (65 feet) and shall have an IP68 protection rating. The motor shall be of the squirrel-cage induction design, NEMA type B. The copper stator windings shall be insulated with moisture resistant, Class H insulation material, rated for 180°C (356°F). The stator shall be press fitted into the stator housing. The use of bolts, pins, or other fastening devices requiring penetration of the stator housing is unacceptable. The rotor bars and short circuit rings shall be made of cast aluminum.

The motor shall be designed for continuous duty. The maximum continuous temperature of the pumped liquid shall be 40°C (104°F), and intermittently up to 50°C (122°F). The motor shall be capable of handling up to 10 evenly spaced starts per hour without overheating. The service factor (as defined by the NEMA MG1 standard) shall be 1.3. The motor shall have a voltage tolerance of +/- 10% from nominal, and a phase-to-phase voltage imbalance tolerance of 1%. The motor shall have a NEMA Class A temperature rise, providing cool operation under all operating conditions. The motor shall be FM approved for use in NEC Class I, Division I, Groups C & D hazardous locations. The surface temperature rating shall be T3C. The motor shall meet the requirements of NEMA MG1 Part 30 and 31 for operation on PWM type Variable Frequency Drives.

Cooling System: The factory installed closed-loop cooling system shall be of steel, 1.0036 (ASTM A-570, Grade D), adequately designed to allow the motor to run continuously under full load while in an unsubmerged (dry-pit) or minimally submerged condition without the need for de-rating or reduced duty cycle. A cooling jacket shall surround the stator housing, and an environmentally safe nontoxic propylene glycol solution shall be circulated through the jacket by an axial flow circulating impeller attached to the main motor shaft. The coolant shall be pumped through an integrated heat exchanger in the base of the motor whenever the motor is running, allowing excess heat to be transferred to the process liquid. Cooling systems that circulate the pumped medium through the cooling jacket, or those that use a toxic cooling liquid shall not be acceptable. The use of external heat exchangers, fans, or the supply of supplemental cooling liquid shall not be required.

Thermal Protection: Each phase of the motor shall contain a normally closed bi-metallic temperature monitor switch imbedded in the motor windings. These thermal switches shall be connected in series and set to open at 140°C +/- 5°C

(284°F). They shall be connected to the control panel to provide a high stator temperature shutdown signal, and are used in conjunction with external motor overload protection.

Mechanical Seals: Each pump shall be equipped with a triple seal system consisting of tandem mechanical shaft seals, plus a radial lip seal; providing three complete levels of sealing between the pump wet end and the motor. The mechanical seal system shall consist of two totally independent seal assemblies operating in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The mechanical seals shall be of nonproprietary design, and shall be manufactured by a major independent manufacturer specializing in the design and manufacture of mechanical seals. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary industrial duty solid silicon-carbide seal ring and one rotating industrial duty solid silicon-carbide seal ring. The stationary ring of the primary seal shall be installed in a seal holding plate of gray cast iron EN-GJL-250 (ASTM A-48, Class 35B). The seal holding plate shall be equipped with swirl disruption ribs to prevent abrasive material from prematurely wearing the seal plate. The upper, secondary seal unit, located between the lubricant chamber and the sensing chamber, shall contain one stationary industrial duty solid silicon-carbide seal ring, and one rotating industrial duty solid silicon-carbide seal ring. Each seal interface shall be held in contact by its own spring system. A radial lip seal shall be positioned above the sensing chamber, preventing any liquid that accumulates in the sensing chamber from entering the lower bearing and motor. The seals shall not require routine maintenance, or adjustment, and shall not be dependent on the direction of rotation for proper sealing. Each pump shall be provided with a lubricant chamber for the shaft sealing system that shall provide superior heat transfer and maximum seal cooling. The lubricant chamber shall be designed to prevent overfilling, and to provide lubricant expansion capacity. The drain and inspection plug shall have a positive anti-leak seal, and shall be easily accessible from the outside of the pump. The seal system shall not rely upon the pumped media for lubrication and shall not be damaged when the pump is run dry. Lubricant in the chamber shall be environmentally safe nontoxic material.

The following seal types shall not be considered equal: Seal systems with less than three complete levels of sealing between the pump wet end and the motor. Seals of proprietary design, or seals manufactured by other than major independent seal manufacturing companies. Seals requiring set screws, pins, or other mechanical locking devices to hold the seal in place, conventional double mechanical seals containing either a common single or double spring acting between the upper and

lower seal faces, or any system requiring a pressure differential to seat the seal and ensure sealing.

Mechanical Seal Protection System: The primary mechanical seal shall be protected from interference by particles in the wastewater, including fibrous materials, by an active Seal Protection System integrated into the impeller. The back side of the impeller shall be equipped with a sinusoidal cutting ring, forming a close clearance cutting system with the lower submersible motor housing or seal plate. This sinusoidal cutting ring shall spin with the pump impeller providing a minimum of 75 shearing actions per pump revolution. Large particles or fibrous material that attempt to lodge behind the impeller or wrap around the mechanical seal, shall be effectively sheared by the active cutting system into particles small enough to prevent interference with the mechanical seal. The Seal Protection System shall operate whenever the pump operates, and shall not require adjustment or maintenance in order to function. Submersible pump designs that do not incorporate an active cutting system to protect the primary mechanical seal shall not be considered acceptable for wastewater service.

Seal Failure Early Warning System: The integrity of the mechanical seal system shall be continuously monitored during pump operation and standby time. An electrical probe shall be provided in a sensing chamber positioned above the mechanical seals for detecting the presence of water contamination within the chamber. The sensing chamber shall be oil-filled, and shall have a drain / inspection plug with a positive anti-leak seal which is easily accessible from the outside of the pump. A solid-state relay mounted in the pump control panel or in a separate enclosure shall send a low voltage, low amperage signal to the probe, continuously monitoring the conductivity of the liquid in the sensing chamber. If sufficient water enters the sensing chamber, the probe shall sense the increase in conductivity and signal the solid state relay in the control panel. The relay shall then energize a warning light on the control panel. Systems utilizing float switches or any other monitoring devices located in the stator housing rather than in a sensing chamber are not considered to be early warning systems, and shall not be considered equal.

Shaft: The pump shaft and motor shaft shall be an integral, one piece unit adequately designed to meet the maximum torque required at any normal start-up condition or operating point in the system. The shaft shall have a full shutoff head design safety factor of 1.7, and the maximum shaft deflection shall not exceed .05 mm (.002 inch) at the lower seal during normal pump operation. Each shaft shall be of stainless steel, 1.4021 (AISI 420) and shall have a polished finish with

accurately machined shoulders to accommodate bearings, seals and impeller. Carbon steel, chrome plated, or multi-piece welded shafts shall not be considered adequate or equal.

Bearings: Each pump shaft shall rotate on high quality, permanently lubricated, greased bearings. The upper bearing shall be a cylindrical roller bearing and the lower bearings shall be a matched set of at least three heavy duty bearings; two angular contact ball bearings and one cylindrical roller bearing. All three lower bearings shall have identical outer race diameters to provide maximum bearing load capacity. Designs that utilize a roller bearing with a smaller outer diameter than the other bearings in the assembly do not provide maximum load capacity and shall not be considered equal. Bearings shall be of sufficient size and properly spaced to transfer all radial and axial loads to the pump housing and minimize shaft deflection. L-10 bearing life shall be a minimum of 100,000 hours at flows ranging from Ω of BEP flow to 1Ω times BEP flow (BEP is best efficiency point). The bearings shall be manufactured by a major internationally known manufacturer of high quality bearings, and shall be stamped with the manufacturer's name and size designation on the race. Generic or unbranded bearings from other than major bearing manufacturers shall not be considered acceptable.

Power Cable: The power cables shall be sized according to NEC and CSA standards and shall be of sufficient length to reach the junction box without requiring splices. The outer jacket of the cable shall be of chlorinated polyethylene (CPE) and be oil, water, and UV resistant, capable of continuous submerged operation underwater to a depth of 65 feet.

Cable Entry/Junction Chamber: The cable entry design shall not require a specific torque to insure a watertight seal. The cable entry shall consist of cylindrical elastomer grommets, flanked by stainless steel washers. A cable cap incorporating a strain relief and bend radius limiter shall mount to the cable entry boss, compressing the grommet ID to the cable while the grommet OD seals against the bore of the cable entry. The junction chamber shall be isolated and sealed from the motor by means of sealing glands. Electrical connections between the power cables and motor leads shall be made via a compression or post type terminal board, allowing for easy disconnection and maintenance.

Accessories

Base Assembly - The pump shall be secured to a split steel support stand attached to channel steel subbase and welded to the station floor. Stand shall be of suitable

strength to support the weight of the pump and resist any expected torsion, bending, or vibration forces. The pump shall be suitable for either vertical or horizontal dry-pit installation without requiring any internal modifications.

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Bid Disclosure

The Town of Montville reserves the right to reject any or all bids and waive any informalities or irregularities in the bid procedure or bids.

The Town may hold the RFPs for a period not to exceed sixty (60) days from the date of the bid opening to review the bids and investigate the bidders' qualifications prior to awarding the contract.

All responders are advised the Town of Montville has enacted through resolution the following special condition concerning Town bids and purchases:

Seller agrees that as a condition of his sale of goods and/or services to the Town of Montville, the Town of Montville will be authorized to deduct from the proceeds due Seller an amount not to exceed 25% of the total amount due Seller. Said amount is to be applied against any unpaid and overdue taxes, assessments, fees, or other charges levied by the town of Montville or any agency thereof against the Seller. The Seller further agrees that Seller shall insure that Seller has the right to withhold an amount not to exceed 25% from each subcontractor working for the Seller, and providing goods and/or services to the Town of Montville, and to remit such withheld money to the Town in full or partial satisfaction of any unpaid and overdue taxes, assessments, fees, or other charges levied by the Town of Montville or any agency thereof against such subcontractor.

The undersigned has examined the basic requirements of the **RFP** and hereby offers to provide the Town of Montville Water Pollution Control Authority Parts Labor & Installation by the specifications in this RFP for the Total Sum of \$_____

Date: _____

Signature: _____

(Print) Name _____ Title: _____

Firm: _____

Address: _____