



Alternative/Experimental OWTS Technology Program

Vendor Information:

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Contact:

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Technology Name & Model Numbers:

Amphidrome – All Residential and Commercial
Design Flows

Pretreatment Category:

Category 1: Timed- Dosed

Design Authority:

CI-II Licensed Designers & RI-PEs

Technology Type:

Class Two Approval
Total Nitrogen ≤ 19 mg/L
TSS ≤ 20 mg/L
BOD ≤ 20 mg/L
Oil & Grease ≤ 5 mg/L

Certification Dates:

Renewed: August 6, 2020
Expires: August 6, 2025

CERTIFICATION

The Rhode Island Department of Environmental Management (RIDEM) has reviewed the Alternative Technology renewal application submitted by F.R. Mahony & Associates, Inc., hereafter referred to as the “Vendor”, for the Amphidrome treatment system, a submerged attached growth bioreactor process operating in batch mode. Based upon the information contained in the application the RIDEM hereby accepts Amphidrome, hereafter referred to as the “Technology” and hereby renews the Technology’s approval.

The Technology sends mixed liquor from an anoxic tank through a patented sand and gravel media filter. After the filter effluent is sent to a clearwell. Effluent is returned back and forth through the tanks and filter in a batch mode over a 24-hour period. The Technology is run by a Programmable Logic Controller (PLC) that controls the pumps, air blowers, monitors the level switches, and make adjustments based on flows and pump times in the clear well, as well as all alarm functions and data collection.

The RIDEM recognizes the Technology as capable of achieving effluent concentrations of ≤ 19 mg/L Total Nitrogen. The RIDEM also recognizes the Technology as a Category 1 technology as defined in the Rules Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Onsite Wastewater Treatment Systems (the OWTS Rules), as amended. Category 1 technologies are advanced treatment units that are timed-dosed and have been classified by the RIDEM to at least meet effluent standards of ≤ 20 mg/L for TSS and BOD and ≤ 5 mg/L for Oil and Grease.

Design and installation of the Technology shall be in accordance with the following terms and conditions:

I. General Design Requirements

1. The Technology is approved for the reduction of Total Nitrogen to ≤ 19 mg/L, TSS and BOD

to ≤ 20 mg/L, and Oil and Grease to ≤ 5 mg/L for all uses (commercial and residential) and all design flows.

2. All designs incorporating the Technology shall be reviewed by and deemed acceptable to the Vendor prior to submitting a construction permit application to the RIDEM. For existing facilities RIDEM will require sampling and testing of the wastewater, if an application is submitted for a new facility an estimate/projection of wastewater characteristics will be required.
3. Design shall be in strict conformance with the RIDEM-approved Amphidrome Design Guidance Document dated: **June 15, 2020**.
4. Mechanical aeration is key to the performance of the Technology. To ensure Owner/Operator compliance with the Technology's operating requirements, all designs shall specify an hour meter and audible and visual alarms to indicate power interruption to the Technology. To ensure owner/operator compliance with this condition, all installations of the Technology shall be equipped with an hour meter and a visible and audible motor/power failure warning light, mounted on a NEMA approved cabinet on the exterior of the building. The Technology shall be equipped with a programmable logic controller and a strip-heater (for low temperature control). In commercial applications the RIDEM may allow alarms to be installed inside provided the Department has access to the building at all reasonable times.
5. Leachfield Area Reduction
 - a) Designs incorporating this Technology and a conventional leachfield shall be allowed a 50% reduction in the required leachfield size. This reduction is based upon the ability of the Technology to remove BOD and TSS as demonstrated by the data presented in the Vendor's submittal. No reduction in leachfield size shall be allowed for non-conventional leachfields unless the leachfield is approved as a Class One alternative component and such reduction is not prohibited by the Class One alternative component Certification. Deep leaching chambers and any conventional leachfield using more than one foot of stone below shall be prohibited with or without the reduction.
6. Technology tanks, dosing chambers, pumping chambers, and riser assemblies shall be certified watertight by the manufacturer or field-tested and certified watertight using procedures set forth in the OWTS Rules.
7. Each Technology design shall meet all other applicable OWTS Rules and receive prior approval by the RIDEM pursuant to the regulations in effect at the time of application.
8. Design and installation shall be in strict conformance with the RIDEM-approved Technology manual and shall only be performed by a Rhode Island licensed designer/installer who has received training and is authorized in writing by the Vendor to design/install the Technology.

II. Training

1. The Vendor shall make training available for designers, installers, and service providers.
2. The Vendor shall notify the RIDEM of the date and time of each training seminar and submit to the RIDEM a detailed agenda, material to be distributed to attendees and a list of presenters specifying their credentials at least six weeks in advance of the date of the scheduled seminar. Please consult the RIDEM-issued requirements for Vendors' technology training available on the RIDEM website in the A/E technology section.
3. The Vendor shall make available to the public, a means of verifying individuals, by name and category, who have received training and are authorized in writing by the Vendor to design, install, and maintain the Technology.

III. General Certification Requirements

1. This Class Two certification shall be effective until its expiration and may be renewed according to the provisions of the OWTS Rules, as amended.
2. The Vendor is responsible for providing any revisions to the design, installation, operation and maintenance manual(s) for all models applicable to this certification to RIDEM for review and approval within thirty (30) days of RIDEM request. All manuals must be provided to the RIDEM in electronic portable document format (pdf).
3. The Vendor shall notify the RIDEM in writing of any changes to the Technology, including its discontinuation. Modifications deemed by the RIDEM to be substantial, may require re-application to the alternative/experimental program.
4. The Vendor shall notify the RIDEM at least 30 days prior to any proposed transfer of ownership of the Technology. Notification shall include the name and address of the new owner and a written agreement between the existing and new owner specifying a date for transfer of ownership, responsibility, and liability for the technology. All provisions of this approval shall be applicable to any new owners.
5. The Vendor shall provide any purchaser of the Technology with a copy of this approval prior to the sale of the Technology.

IV. Operation and Maintenance Requirements

1. Operation and maintenance of the Technology shall be performed in strict conformance with the RIDEM approved O&M Manual dated: **June 30, 2020**.
2. The RIDEM approved O&M Manual shall be provided to the Owner/Operator.
3. Installations of the Technology shall be maintained according to the manufacturer's specifications.
4. For seasonally used installations of the Technology, the Vendor shall provide specifications for protection of the Technology and the biological component from freezing, and conditions under which power to the Technology may be turned off.
5. The Vendor must offer for sale a minimum two-year service contract, which must include as an option, service to all components of the treatment train in addition to the Technology.
6. The Applicant/Owner shall record copies of the OWTS construction permit issued by RIDEM and the initially executed O&M contract(s) for the Technology, and all other A/E components in the treatment train, in the land evidence records of the applicable city or town prior to the RIDEM issuing the Certificate of Conformance for each installation.
7.
 - a) The owner shall retain a public or private maintenance entity (service provider) for the life of the Technology and all other A/E components of the treatment train.
 - b) No agreement with a maintenance entity shall be for less than two years.
 - c) Service providers must be trained and authorized in writing by the appropriate Vendor to perform O&M on the Technology and all other A/E components of the treatment train for which they will be performing O&M.
 - d) The service provider providing O&M shall:
 - (1) Receive training as approved by the Vendor.
 - (2) Be available to perform required preventative maintenance, perform repairs, respond to Technology emergency situations, and conduct performance monitoring when required by this Certification or by permit.
 - (3) Perform an inspection of the treatment Technology at least twice annually for residential systems and quarterly for commercial systems or any systems with an approved design flow of ≥ 2000 gallons per day.

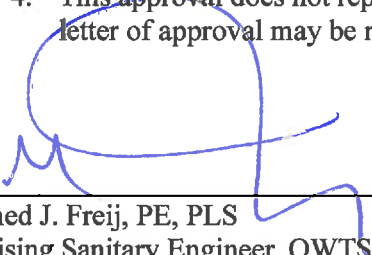
8. The Vendor shall have an inventory of Technology replacement parts available locally.

V. Monitoring and Reporting Requirements

1. For permits issued utilizing the Technology with an approved design flow ≥ 2000 gallons per day the system owner is responsible for compliance with the following additional requirements. Wastewater effluent must achieve concentrations of ≤ 19 mg/L for Total Nitrogen prior to discharge to the soil treatment area when required by the OWTS Rules. Wastewater effluent must achieve the following effluent concentrations of ≤ 20 mg/L for TSS and BOD and ≤ 5 mg/L for Oil and Grease prior to discharge to the soil treatment area in all areas of the State of Rhode Island. Wastewater flow shall be monitored and recorded to ensure the approved design flow is not exceeded. In addition, sampling and testing shall be conducted quarterly for the following parameters: Dissolved Oxygen (mg/L), Effluent Temperature ($^{\circ}$ F), pH (s.u.), Biochemical Oxygen Demand - 5-Day (mg/L), Total Suspended Solids (mg/L), Oil and Grease (mg/L), and Alkalinity (mg/L). Sampling and testing shall be conducted quarterly for Total Nitrogen (mg/L) when Nitrogen reduction is required by the OWTS Rules. All monitoring results including wastewater flow data shall be submitted to the RIDEM in the form of an annual report. The annual report is due February 15th of each year. The annual report must summarize all monitoring results and corrective actions implemented during the previous calendar year. A clear determination regarding the compliance status of the OWTS must be made as part of the annual report. The annual report must include a copy of the most recent Operation and Maintenance contract as proof of compliance with the requirement to maintain an active contract throughout the life of the OWTS.

VI. Rights of the RIDEM

1. The RIDEM may suspend, modify or revoke this approval for cause, including but not limited to: non-compliance with any of the provisions or conditions of this Certification, misrepresentation or failure to disclose fully all relevant data, or receipt of new information indicating that the use of the Technology is contrary to the public interest, public health or the environment.
2. The design, installation, and operation and maintenance manuals referenced herein are approved upon the date of approval of this Certification.
3. The RIDEM reserves the right to suspend or revoke this Certification if updated design, installation, and O&M manuals are not provided to the RIDEM within thirty (30) days of RIDEM request or one hundred and eighty (180) days prior to the expiration date of this Certification. All revisions must be reviewed and approved by the RIDEM.
4. This approval does not represent an endorsement of the Technology by the RIDEM. This letter of approval may be reproduced only in its entirety.



Mohamed J. Freij, PE, PLS
Supervising Sanitary Engineer, OWTS Program

8.6.2020

Issuance Date