Alex Elvin, DRI Coordinator  
Martha’s Vineyard Commission  
P.O. Box 1447  
Oak Bluffs, MA 02557

June 2, 2022

Re: Lagoon Ridge Amphidrome Plus™ WWTP

Dear Mr. Elvin,

The Amphidrome® system has been used successfully for more than 26 years. There are approximately one hundred twenty five (125) single family installations and more than one hundred and fifty (150) large systems installed (systems with flows greater than 2,000 gallons per day up to 600,000 gallons per day). Each system is designed according to its unique load and flow. The larger units are used in housing developments, schools, shopping plazas, offices complexes and restaurants. Amphidrome® technology was issued EPA ETV approval in 2003 (see report) and has been approved by the MASS DEP (Title 5) since 2006.

The majority of single family units are in the New Jersey Pinelands but we do have roughly 10-15 on Nantucket, 15 installations around the mainland in Massachusetts and there is one installation on Martha’s Vineyard at 46 Summit Ave, Oak Bluffs MA.

The wastewater treatment system for the Lagoon Ridge development is a dual-train Amphidrome® Plus™ system. The system consists of two (2) main reactors followed by a single polishing (denitrification) filter. An overview of the flow through the system is described below.

The wastewater enters the anoxic tank and flows into an equalization pump tank. Dual-alternating pumps will deliver the wastewater to each reactor. Water flows by gravity through the reactor, which is intermittently aerated, and into the main clearwell. From the clearwell, water with a supplemental carbon source is delivered to the Amphidrome Plus™ reactor using a pair of pumps. Water flows from the Plus™ reactor to the final discharge tank. Discharge from final discharge tank to the disposal fields is achieved using two (2) dual-alternating pumps.

The use of dual-alternating pumps will ensure that the forward-flow of the system is maintained in the event of the loss of one of the two pumps. The system will provide an alarm in the event of a pump failure and the ‘working’ pump will assume all discharge duties. The Homa pumps used at the facility are typically available from the manufacturer within two-weeks, if they are not in stock at F.R. Mahony. The system will operate within permit limits even with one reactor off-line.

The performance data from The Pinelands study in NJ which included more than 100 single family units indicates that an Amphidrome® system without a Plus™ filter is able to achieve an average of less than 14mg/L TN (systems averaged 11.9 TN – see report page 21). These systems were serviced quarterly and data included ALL systems, even those which were not serviced properly. A system that is serviced at least weekly will be able to meet this limit.
The system at Lagoon Ridge is designed for a Title 5 flow of 110 gallons per day per bedroom. This design flow is, in reality, more than two (2) times the actual flow so in the event a single reactor goes ‘down’, the system will be able to treat the waste stream.

The system will have a back-up generator, which will allow the system to operate in the event of a power-loss. The operational program stores the state of the program and is designed to sequentially start the system and resume operation at the point of power-loss with no loss of data. In the rare chance that the generator fails, the system is designed to be able to flow to the clear well.

The system itself does use some mechanical equipment (e.g. pumps and blowers). Like most mechanical equipment it will need to be maintained and eventually replaced. However with dual pumps and blowers the system will operate and meet permit while waiting for replacement parts.

The media used in the system does not degrade and will not require replacement. Wastewater is filtered through several feet of sand media in the reactors and this filtration along with the high level of BOD removal, will ensure an extended life for the leaching field.

Please, note that we have never been asked to bond the system.

The system is conservatively designed and if well operated and maintained will meet current permit. 20 years of experience backs up the last statement.

Hopefully this helps address any concerns you may have.

Andrew McBrearty
Director of Engineering
FR Mahony & Associates