

C.T. MALE ASSOCIATES

Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C.

50 Century Hill Drive, Latham, NY 12110
518.786.7400 FAX 518.786.7299 www.ctmale.com



TECHNICAL MEMORANDUM

To: Terramor Outdoor Resorts
From: C.T. Male Associates
Subject: Wastewater Collection and Disposal
Date: June 30, 2022
Project: Terramor Outdoor Resort – Saugerties, NY

SUMMARY

This technical memorandum provides the preliminary basis of design for wastewater collection and treatment at the proposed Terramor Outdoor Resort in Saugerties, Ulster County, New York.

DESCRIPTION OF WASTEWATER DISPOSAL NEEDS

The campground has 4 facility types which generate wastewater.

1. Glamping Sites
 - a. The proposed project consists of 75 campsites with water and wastewater utilities. There are two types of sites: the '35' and the '45' with 45 sites and 30 sites each, respectively.
2. Guest Amenities
 - a. The proposed project consists of a Lodge with a lounge area, bar seating and restaurant seating.
 - b. The proposed project includes a pool with a cabana including bathrooms and a pavilion.
3. Operational Structures
 - a. The proposed development consists of a Welcome Center and Maintenance Building
4. Employee Housing

C.T. MALE ASSOCIATES

Technical Memorandum: Wastewater Collection and Treatment

June 30, 2022

Page - 2

WASTEWATER STRENGTH

Wastewater generated from the campground will consist of the following types of waste streams:

- Domestic Wastewater - From the campsites, employee housing, guest amenities, and operational buildings.
- Process Wastewater - From floor drains in maintenance building.
- Higher Strength Wastewater - From the Lodge including typical of flows from restaurants. This is expected to have higher concentrations of solids and BOD.

WASTEWATER FLOWS

The calculations for the average wastewater flows are shown in the table below:

Water Demands and Wastewater Flows - Terramor Outdoor Resorts Saugerties				
	Unit	Quantity	Unit Water Use	GPD
Campsites - The '35'	Guests at Max Occupancy	90	50	4500
Campsites - The '45'	Guests at Max Occupancy	150	50	7500
Gen Manager House	# Bedrooms	2	110	220
2 Studio Units	# Bedrooms	4	110	440
6 Dorm Units	# Workers	30	50	1500
Welcome Center	# Employees	4	15	60
Maintenance Building		1	10	10
Lodge - Tabletop	# Seats	40	35	1400
Lodge - Bartop	# Seats	28	20	560
Lodge - Lounge	# Seats	50	20	1000
Total				17190

WASTEWATER COLLECTION

Wastewater from the proposed development will be collected in a series of wastewater subcatchments which collect and convey wastewater by gravity to a low-pressure-sewer (LPS) pump station with grinder pumps. Each pumpstation is connected into a LPS network which

C.T. MALE ASSOCIATES

Technical Memorandum: Wastewater Collection and Treatment

June 30, 2022

Page - 3

pumps wastewater to a packaged wastewater treatment plant. A LPS system was selected to minimize rock excavation expected to due to the presence of shallow bedrock at the site. The gravity sewers are 4" PVC. The LPS forcemain network varies in sizes with 1.25", 2" and 3" HDPE piping.

WASTEWATER TREATMENT

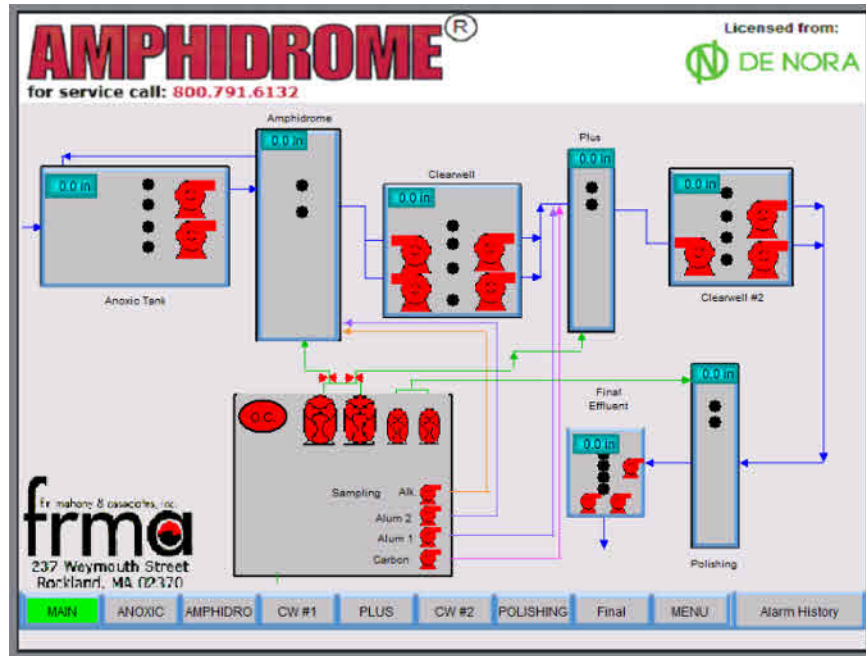
Due to the shallow bedrock, subsurface treatment and disposal is not proposed at this time. The proposed method of treating and disposing of wastewater from the development is with a packaged wastewater treatment plant (WWTP). This basis of design technical memo uses the Amphidrome System Packaged WWTP which is a submerged attached growth biologically active filter (BAF) which can provide BOD reduction, nitrification, denitrification, phosphorus reduction and filtration of suspended solids in a single reactor. A brochure from the manufacturer is attached to this memo. The wastewater from the lodge is conveyed to a grease trap prior to flowing by gravity to a pump station to reduce the levels of fats, oils, and grease at the WWTP.

As required prior to submission of an application for approval from the NYSDEC, a pre-application conference has been requested with the NYSDEC but has not occurred. At this time, it is assumed that the facility will obtain a SPDES permit from the NYSDEC to discharge treated effluent the perennial stream located onsite. The preliminary design of the Amphidrome System assumes typical effluent limits for discharging to a surface water from the NYSDEC Manual for Design for Intermediate Sized Wastewater Treatment Systems.

PERMITTING

The design for the wastewater collection and treatment system will be submitted to the NYSDEC for review and approval. It is not expected that the UCDOH will be involved with the review because of the volume of wastewater expected and it is not planned to utilized subsurface disposal.

CUSTOMIZED TOUCH SCREEN CONTROLS



Amphidrome®

Waste Water Treatment System



Typical Applications

- Condominiums
- Cluster System Developments
- Health Care Facilities
- Resorts
- Shopping Malls
- Schools
- Office Parks



Single Family Home

Advanced Nutrient Removal

Low Visual Site Impact

Your Economical Treatment Solution



Water & Wastewater Technologies

tel. 800-791-6132
 fax. 781-982-1056
www.amphidrome.com



Amphidrome® System



The **Amphidrome® System** is a Submerged Attached Growth **B**ioactively **A**ctive **F**ilter (BAF) providing BOD reduction, superior nitrification, denitrification, phosphorus reduction and filtration of suspended solids in a single reactor.

A spherical sand media provides maximum surface area for microorganisms to attach themselves. The microorganism environment is manipulated with intermittent aeration.

The result is an energy efficient superior treatment system with a very small footprint.

With the addition of an **Amphidrome® Plus™** denitrification reactor, nitrogen is further reduced to the lowest level biologically attainable. An enhanced level of phosphorus reduction can also be achieved.

A small building houses a control panel, blowers, and any other ancillary equipment as may be required for a specific application such as alkalinity feed or ultraviolet (UV) disinfection.

SYSTEM BENEFITS

Low Visual Site Impact	System Below Grade
Low Audible Site Impact	Premium Sound Enclosed Blowers
Simple to Operate	Touch Screen, Remote Access for Monitoring and Control
Energy Efficient	Intermittent Aeration
Consistent Treatment	Fixed Film Reactor With High Biomass
Filtered Effluent	Effluent Is Filtered Through Our Deep Media Bed Filter
Easily Upgradable	Future Nitrogen or Phosphorus Limits

ALL SYSTEMS ARE CUSTOM CONFIGURED TO MEET STRINGENT LIMITS

Advanced Nutrient Removal

Ammonia < 1 mg/l

Nitrogen to ≤ 3 mg/l TN

Phosphorus ≤ 0.15 mg/l TP

Contaminants of Emerging Concern

TOC Reduction