



The State of New Hampshire
Department of Environmental Services



Robert R. Scott, Commissioner

Notice of Environmental Review Determination

The Star Island Corporation has applied for a Clean Water State Revolving Fund (CWSRF) loan through the State of New Hampshire Department of Environmental Services in accordance with provisions of Chapter Env-Wq 500 rules of the department.

As the proposed project is a minor project where all work will take place within the existing wastewater treatment facility grounds or on previously disturbed areas, it has been determined by the Department that the proposed project qualifies for a Categorical Exclusion (CE).

Questions regarding this project can be directed to Daniel Jacobson, E.I.T., Underwood Engineers, (603) 230-9898.

Please address any comments to the following locations:

Daniel Jacobson
Underwood Engineers
99 North State Street
Concord, NH 03301

and

Tracy Wood
NHDES
Wastewater Engineering Bureau
PO Box 95
Concord, NH 03302

The deadline for submitting comments is June 16th, 2018 at 4:00 p.m.



ENVIRONMENTAL REVIEW
FOR CLEAN WATER SRF LOANS
Water Division/Wastewater Engineering Bureau



RSA/Rule: Env-Wq 508

I. PROJECT APPLICANT

STAR ISLAND CORPORATION

ADDRESS

30 MIDDLE STREET
PORTSMOUTH, NH 03801

PROJECT

WWTF UPGRADE
ROCKINGHAM COUNTY

SRF PROJECT NUMBER

CS-331000-01

II. INTRODUCTION

The Star Island Corporation located in Portsmouth, NH has applied for a Clean Water State Revolving Fund (CWSRF) loan through the State of New Hampshire Department of Environmental Services in accordance with provisions of Chapter Env-Wq 500 rules of the department. These rules prescribe procedures for the application process concerning the CWSRF of the department. This document will discuss the requirements of Part Env-Wq 509 of these rules, the environmental review.

III. BACKGROUND

The Star Island Corporation (SIC) owns and operates its own wastewater treatment facility (WWTF), built in 1996, located on Star Island in Rye, New Hampshire. The existing treatment process consists of an equalization tank and a sequencing batch reactor followed by chlorine disinfection and dechlorination. The effluent is then discharged via a force main to the Atlantic Ocean. The WWTF accepts flow from multiple facilities located on the island with the majority of wastewater being generated at the hotel. The hotel includes sleeping quarters, showers, laundry, and dining facilities, and has an occupancy of 293 persons during peak tourist periods. Additionally, the SIC staff consists of approximately 110 persons during peak tourist periods.

The following document concerning the recommended upgrades has been developed and is available for public review:

Star Island Wastewater Treatment Facility Evaluations, Underwood Engineers, February 16, 2018.

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IV. PURPOSE AND NEED

The purpose of this project is to implement changes to improve Star Island's wastewater treatment facility's ability to treat the variable high strength influent wastewater. Due to the water conservation practices on the island and the high proportion of wastewater generated at the hotel dining facilities, the influent wastewater contains high levels of fats, oils, and greases, as well as high salinity which causes process stabilizations issues. The facility struggles to meet Total Coliform limits on a consistent basis and has not done well with effluent TSS. Also, the existing sequencing batch reactor process (SBR) is labor intensive to startup, operate, and shut down. A new Amphidrome system is proposed that is capable of treating the high strength influent flows and is consistently able to meet effluent limits.

V. ALTERNATIVES ANALYSIS

Multiple alternative treatment technologies were evaluated for the upgrade of the Star Island WWTF. Each alternative was scored using a screening matrix and the technologies were narrowed down to a select few to be looked at in greater detail.

1. Rotating Biological Contactor (RBC): The RBC was considered because of its simple operations and low power requirements. Each train of the process would consist of 3-compartment RBC tank holding media, a primary clarifier, a conical secondary clarifier, a polishing filter, and a polymer makeup and feed system to aid with filtration. This option was not feasible due to the multiple treatment steps requiring a larger footprint and the total cost for the components.
2. Fixed Activated Sludge Treatment (FAST): The FAST technology was considered because of its ability to handle high strength wastewaters and for its low maintenance requirements. Each train of the FAST process would consist of an 8,750 gallon settling basin, a MicroFAST 9.0 unit, a MicroFAST 3.0 unit, an influent pump, and an area blower feeding each of the MicroFAST units. This technology utilizes fixed film media suspended in the top portion of a bioreactor. The cons of the FAST process are high power requirements, and the lack of a barrier against TSS washout.
3. AdvanTex: The AdvanTex process also utilizes fixed film media suspended over a wetwell and uses recirculation pumps to redistribute the wastewater multiple times via spray headers. The AdvanTex process would consist of two 17,500 gallon septic tanks, a common equalization basin, two dosing pumps to supply wastewater to the six AdvanTex bioreactors, a 13,000 gallon recirculation tank, two recirculation pumps, and two effluent pumps. The main cons for the AdvanTex system are that it requires a large footprint, is a lesser proven technology, and there is no barrier to prevent TSS washout.
4. Imhoff Tank and Recirculating Sand Filter (RSF): The Imhoff Tank and RSF alternative was evaluated because of the low power requirements, simple operation, and high effluent quality. This process would consist of two Imhoff Tanks operated in parallel, three recirculating sand filter beds, a 35,000 gallon clearwell, a duplex pumping station to dose the RSFs, and process piping to allow for recirculation of flow. This alternative requires a large footprint and would therefore

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greatly impact the island's aesthetics. Other cons include limited operator control, permitting issues, and difficulties with future expansion.

5. Amphidrome: The Amphidrome system consists of septic tanks followed by biologically active filters. The Amphidrome system alternative was evaluated because of the high effluent quality and simple operation. This process would consist of two 14,000 gallon septic tanks, Amphidrome reactors, influent feed pumps, backwash pumps, aeration blowers, and a 5,000 gallon clearwell. This system will fit entirely into the existing tankage. The cons of this system is the slightly higher power requirements when compared to other alternatives.
6. No Action: The no action alternative would consist of keeping Star Island's existing wastewater treatment facility which consists of an equalization basin and a sequence batch reactor. The cons of this alternative is that the facility as it exists is not equipped to treat the high strength influent flows including fats, oils, grease, and high saline conditions.

The Amphidrome System alternative was chosen because of its simple operation, ability to treat high strength influent flows, and its small footprint that will fit entirely in the facility's existing tankage.

VI. DETAILS of PROJECT

The preferred alternative is the Amphidrome treatment system. The proposed Amphidrome equipment consists of two 14,000 gallon septic tanks, Amphidrome reactors, influent pumps, backwash pumps, aeration blowers, and a 5,000 gallon clearwell. The proposed system fits nicely within the existing WWTF tankage.

The proposed project includes the following components:

1. Demolish and remove the equipment within the existing equalization tank and sequencing batch reactor.
2. Modify the existing equalization tank to divide the tank into two separate tanks.
3. Installation of multiple Amphidrome reactor modules into the existing sequencing batch reactor tank.
4. Installation of new clearwell tank into the existing sequencing batch reactor tank.
5. Structural modifications to provide access to new equipment.
6. Modification of process piping to convert the existing equalization tank and sequencing batch reactor treatment system to a septic tank and Amphidrome treatment system.
7. Electrical modifications to provide power, control, and instrumentation wiring to the new treatment system.

The proposed upgrades will all occur within the tankage of the existing wastewater treatment facility, with the exception of the new electrical conduits and wires which will be run above grade to the existing electrical building located adjacent to the existing tanks. The new electrical equipment will be installed in the electrical building where the electrical equipment currently exists.

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Pre-disturbed areas within the WWTF grounds have been identified to be used for staging and stockpiling areas. The estimated area of temporary impact is 1,000 square feet.

No tree cutting or clearing will occur under this project and no structures will be removed or replaced under this project.

The total project cost is estimated to be \$947,500.

It is Star Island Corporation's goal to eventually re-use treated wastewater on the island to ease the load of meeting daily water demands. The use of reclaimed water on the island will reduce electrical demands and minimize the potential for salt water fouling at the WWTF. In the future, the treated effluent will be discharged to either the ocean outfall or to further treatment for re-use on site. Integrated into the WWTF upgrade will be valves and fittings to allow installation of a polishing filter at several different locations throughout the treatment process. Once the Amphidrome system operates for a sufficient period of time to prove its treatment performance, SIC will pilot test the possible locations of the polishing filter. New on-line conductivity meter, turbidimeter, flow meter, and chlorine residual meter will also be installed. SIC also plans to conduct disinfection trials with their existing chlorine contact tanks this summer.

VII. ENVIRONMENTAL CONCERNS AND MITIGATION

The environmental concerns of the project are minimal. No adverse environmental impacts are anticipated from the project. The primary impacts are short-term impacts which will affect the area only during the period of construction. The following categories of impacts will illustrate the potential negative and positive effects anticipated from the project:

Air: Air impacts will be limited to some dust created during the construction portion of the project. Dust will be prevented and controlled through the use of water or dust retardant chemicals. No long-term air impacts are anticipated; mitigation measures will be employed if needed.

Noise: The noise from construction activities should be limited in duration. Noise impacts, if encountered, will be minimized by scheduling work to reduce effects in the area. No long-term noise impacts are anticipated.

Surface Water, Groundwater, Wetlands, and Shoreland: There should be no significant groundwater impacts from the project. No wetland impacts are anticipated. NPDES Construction General or Dewatering Permits will not be required. A Shoreland Permit will not be required. Erosion at stockpile areas will be minimized by using proper erosion control methods such as hay bales, silt fences and rapid re-seeding of affected areas. Best management practices will be employed in this effort. All appropriate permits shall be obtained from local, state and federal agencies as necessary.

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Floodplain: This project does not fall within a floodplain.

Designated River: This project does not fall within a Designated River corridor and therefore does not require notification of a Local Advisory Committee (LAC).

Plants & Wildlife: A Natural Heritage Bureau DataCheck was conducted (NHB18-0851). The NHB DataCheck identified maritime rocky barren, maritime shrub thicket, seabeach dock, smooth black sedge, and tundra alkali grass. No impacts to these natural communities and plant species are expected as the proposed work is all located within the existing wastewater treatment facility area, the majority being inside existing tankage. Pre-disturbed areas adjacent to the WWTF have been identified as equipment and stockpile locations. The NHB has confirmed that there is no recorded occurrences of rare plant species at the identified stockpile locations, nor within/adjacent to the work areas depicted on the attached plans.

Voluntary conservation measures will be employed, where appropriate, in order to reduce impacts to the Northern Long-eared Bat as outlined under item 2 on page 3 of this document: <https://www.fws.gov/midwest/endangered/mammals/nleb/pdf/S7FrameworkNLEB17Feb2016.pdf>

Recreation and Historic: A Request for Project Review has been submitted to the NH Division of Historical Resources. No impacts to recreational or historic areas are anticipated.

Social and Economic: The social and economic impacts from the project are expected to be favorable. The financial impact on the SIC may be reduced for this project through the use of the State Revolving Loan Fund as opposed to other funding sources.

Whereas this project constitutes only a minor project where all work will take place within the existing WWTF grounds or on previously disturbed areas, a Categorical Exclusion (CE) is proposed.

VIII. INTERGOVERNMENTAL REVIEW

Results from the Intergovernmental Review, coordinated by the New Hampshire Office of Energy and Planning, were received on March 23, 2017. The results summary indicates concurrence with the proposed project.

IX. PUBLIC REVIEW

The Star Island Corporation voted to authorize funding in the amount of \$947,500 on November 19, 2016.

A public notice will be published by the NH Department of Environmental Services and a ten-day public comment period will be held in accordance with the CWSRF rules.

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