

Appendix F3  
**Recycled Water Facility  
Location and Odor Control**







## Memorandum

**Date:** November 27, 2017  
**To:** Mark Luckhardt - FivePoint  
**From:** Andre Zinkevich, P.E & Zach Gallagher, P.E. - NSU

### Re: Hunters Point Water Reclamation Plant Siting: Location and Odor Control

Mr. Luckhardt,

The purpose of this memorandum is to confirm that the proposed Hunters Point water reclamation facility **will not** have any objectionable or detectable odor at the perimeter of the facility that would be noticed by the public.

Natural Systems Utilities (NSU) can commit to controlling odor at our sites because we have completed this previously at many of our facilities over the past thirty (30) years. NSU operates over 200 onsite facilities from coast to coast. The facilities range in technology and requirements based on local codes and varying requirements for the intended uses. NSU has been heavily involved in guiding the San Francisco Public Utilities Commission (SFPUC) with their current local reuse ordinance and supplied our in-building water reuse practices as a reference during SFPUC code formation and adoption.

The proposed Hunters Point facility will most closely represent some of our east coast facilities like:

1. **Battery Park, NYC:** Six (6) complete water reuse systems located inside the buildings of high-end residential apartment complexes where odor cannot be present.
2. **Queset Commons, Easton MA:** Wastewater treatment plant for a mixed used development located directly adjacent to homes and commercial establishments.
3. **Gillette Stadium, Foxboro MA:** Onsite water reuse facility for the New England Patriots with the treatment facility located within the commercial district and immediately adjacent to surrounding restaurants.

Aerial images for these three examples have been included as **Attachment A** to illustrate how close the systems can be located to residential and commercial uses as long as the following principles are applied:

1. NSU encloses all unit processes in buildings and under covers
2. NSU collects gases in unit process tank head spaces
3. NSU does not digest or dewater sludge on site where odor is a concern
4. NSU provides carbon scrubbers or other suitable odor control units

Single page case studies have also been included as **Attachment B** and a video tour for the in building systems referenced above can be found at <http://www.nsuwater.com/solutions/water-reuse/>. These in-building systems have **been in operation for over 15 years now without a single odor complaint**. We are confident that the location proposed for the Hunters Point water reuse facility is appropriate and that odor can be adequately managed there.

Please let us know if you have questions or need additional information.

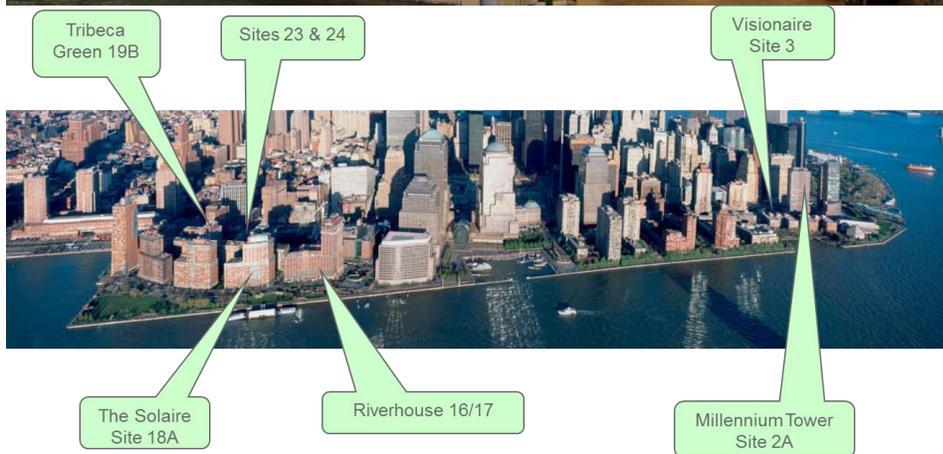
Regards,

Andre Zinkevich & Zach Gallagher

## Attachment A: Aerial Images

### 1. Battery Park, NYC

- Wastewater System in Basement of luxury high-rise buildings
- All unit processes are enclosed
- No sludge processing
- Tank headspace gas captured
- Carbon odor control provided
- In operation for over 15 years without a single odor complaint



## 2. Queset Commons – North Easton, Massachusetts

- Nearby homes and businesses
- All unit processes are enclosed
- No sludge processing
- Tank headspace gas captured
- Carbon odor control provided



## 3. Gillette Stadium – Foxboro, MA

- Onsite water reuse system for the New England Patriots
- Located within the stadium parking lot within the commercial district and adjacent to restaurants
- Carbon odor control provided
- In operation for over 15 years without a single odor complaint



**Attachment B: Case Studies**



## Battery Park City Water Reuse

### New York City, NY

Battery Park City is a redevelopment area of 92 acres under the control of the Battery Park City Authority (BPCA) of New York City. Natural Systems Utilities (NSU) designed, built and currently operates six onsite water treatment and reuse systems serving Battery Park City.

The BPCA adopted a mission of sustainable urban development for the redevelopment of this land, including water reuse objectives, more advanced than LEED requirements. Currently, these six onsite water treatment and reuse systems service eight buildings:

- The Solaire
- Tribeca Green
- Millennium Tower
- The Visionaire
- Riverhouse
- Liberty Luxe
- Liberty View
- The Verdesian

Systems include treatment with hollow fiber micro-filtration membranes, ultraviolet light disinfection, and biological nitrogen removal to comply with New York City Department of Buildings direct water reuse standards. The total design flow for these systems is 165,000 gallons per day (gpd).

#### The Soliare

The first project in NYC to incorporate wastewater

reuse was the Solaire Building, which began operation in 2003. The treated water is reused for flushing toilets in the 293-unit apartment building, cooling tower make-up and for green roof irrigation. The latest systems in Battery Park City also reuse water for laundry.

#### Achievements

These systems have consistently achieved greater than 50% water consumption reduction and a greater than 60% reduction in wastewater discharge (compared to similar base residential buildings in NYC). Water and wastewater savings are the direct result of wastewater reuse and water conservation. Battery Park City has been developed as a model for scaling water conservation and reuse projects in urban redevelopment and campus scale settings.



**The Soliare:  
Green roof (L) and Teardrop Park (R)**

## QUESET COMMONS

Easton, MA

Owner: Douglas A. King, Builders, Inc.

Wastewater Treatment Plant

Design-Build-Operate

Queset Commons is a new mixed use development also located in Easton, Massachusetts. The project is on a 68.7 acre property is within a designated smart growth zoning area, set back from the shoreline of Queset Pond. Existing uses adjacent to Queset Common and on land owned by DAKB include: a 99-unit “active adult apartment community”; and a 240-seat.



Proposed new uses in Queset Commons include: 197 residential units (a mix of condominiums and apartments); 116,000 square feet of retail and commercial space; and an 83-unit assisted living facility. These existing and proposed units will be served by a wastewater treatment facility that has been preliminary designed by AWM. Phase 1 of the project will have design flows of 76,000 gpd; phase 2 will have additional design flows of 24,000 gpd; and phase 3 will have design flows of an additional 50,000 gpd. DAKB has had the wastewater treatment plant building exterior designed by an architect to incorporate historic architect, H.H. Richardson’s design elements, with expansion capacity to the total of 150,000 gpd design flow.

In July, 2013, NSU and DAKB executed a design-build agreement for final design and construction of the first phase of the project providing 76,000 gallons per day of wastewater reclamation capacity. Construction was completed in the summer of 2015, and NSU commenced operation and maintenance under a five-year operating agreement with DAKB, with initial flows limited to 50,000 gpd discharge to a single leachfield.

The Town of Easton has established the Queset Sewer District, which will collect up to 50,000 gpd of wastewater along public rights of way and convey it to the Queset Commons WWTP. The next step is the expansion of the plant and leachfield capacity to 100,000 gpd, which is scheduled to be completed prior to July 1, 2017, to allow for onsite treatment of the private and public wastewater and dispersal. The Town will operate the collection system and DAKB/NSU will operate the WWTP. The town will collect betterment and operating fees from the users of the municipal WWTP and pay DAKB for their share of the capital construction of the WWTP, another leachfield, and the town’s share of the WWTP operating costs. DAKB will eventually increase WWTP and leachfield capacity to 150,000 gpd, when they need that last 50,000 gpd for the build out of the mixed-use smart-growth project.



## ONSITE WATER REUSE SYSTEM

### Gillette Stadium

### Foxborough, Massachusetts

NSU designed, built, and currently operates the water reuse system for Gillette Stadium and Patriot Place; home of the New England Patriots Football Team.



#### Challenge

In 2001, during the design phases of the new stadium, it was determined that, due to the projected water usage required for the arena, the Town of Foxborough's water infrastructure would not be able to supply the required peak demand on game day. It was also apparent that the municipal wastewater treatment facility in place would not be able to handle the excess wastewater flow. Additional services necessary for the stadium and the Town of Foxborough included managing the water reuse system, repair and maintenance, customer services and capital planning.

#### Collaboration for Results

The municipality and the owner cooperated in the construction of a water reuse system that resolved both problems. NSU worked closely with the Town of Foxborough, the owner, an infrastructure engineering firm and the Massachusetts Department of Environmental Protection to ensure that the facility design exceeded the Town's, the Commonwealth's and the stadium's requirements and was constructed within budget and on schedule. The water reuse system was upgraded in 2007 to provide additional capacity. The current system includes: two pumping stations; force mains; almost 1,000,000 gallons of pre-treatment storage volume to capture the wastewater flows generated by fans; a 250,000 gallons per day membrane bioreactor (MBR) treatment plant that generates water suitable for reuse; a leachfield for replenishing groundwater when reuse water is not needed; and a 500,000 gallon elevated storage tank for reclaimed water. The recycled water is used for toilet flushing.

#### Sustainable Communities

The goal was to create a sustainable and environmentally friendly system to produce high-quality reuse water for the stadium's 68,000 fans during peak half-time flush periods – without creating additional demands on the community's existing infrastructure. The implemented system returns high-quality treated wastewater both to the stadium and the adjacent Patriot Place.

